

HOPE BAY PROJECT 2019 Nunavut Impact Review Board Annual Report





HOPE BAY PROJECT

2019 Nunavut Impact Review Board Annual Report

Prepared by
TMAC Resources Inc.
Toronto, ON

April 2020

Executive Summary

The Hope Bay Project (the Project) is an approximately 20 km × 80 km property along the south shore of Melville Sound in Nunavut, Canada. The Project is TMAC Resources Inc.'s (TMAC) prime holding and is its sole focus for exploration, development, and mining. This report to the Nunavut Impact Review Board (NIRB) has been prepared to summarize the Project activities and monitoring conducted under TMAC existing Project Certificate No. 003 for the Doris Project.

In 2019 commercial operations continued at Doris with continued efforts to progressively ramp up production to increase ore throughput and optimize gold recovery.

Civil construction activities included the completion of construction of the Roberts Bay Discharge System (RBDS) and installation of the associated underground mine dewatering and Tailings Impoundment Area (TIA) discharge pipelines and pumping infrastructure. The RBDS facilitates dewatering of the Doris mine and removal of excess water from the TIA to Roberts Bay. The ocean discharge pipeline were successfully installed into Roberts Bay during the open water season. As part of this system, a Water Treatment Plant was constructed to remove Total Suspended Solids from underground mine water at Doris prior to discharge through the RBDS. No discharge occurred to Roberts Bay in 2019. At the Doris site one dorm was added to allow an additional 48 bed spaces and at Roberts Bay and an additional 5 million litre fuel tank was constructed at the Fuel Storage and Containment facility.

Earthworks began at the Madrid North site to support the commencement of mining of the Naartok East Crown Pillar and Madrid North underground decline. This included construction of the first kilometre of the Madrid North all-weather-road, the Madrid North Contact Water Pond, and construction of the Madrid North Waste Rock storage pad. Laydown space and access roads were constructed to support shop facilities, lunchroom/offices and wash car facilities. An overburden stockpile was established to store overburden removed during mining of the Naartok East Crown Pillar.

In the fall, TMAC concluded another successful sealift operation including the purchase and delivery of diesel fuel as well as supplies to support mining and milling activities. The sealift also included additional heavy equipment and supplies to support mining and construction operations.

Consultations in 2019 included two workshops with the Inuit Environmental Advisory Committee (IEAC). The focus of these meetings were to advance the Fisheries No Net Loss Plan and work through viable options for caribou monitoring in relation to the Madrid-Boston Project. The workshops were successful at communicating objectives and gaining and documenting perspectives from the IEAC on potential fisheries and caribou monitoring programs. TMAC also initiated a capacity building program for Inuit Environmental Assistants working at Hope Bay. The program was successful in documenting skills learned during the field season and promoting regular coaching sessions for information exchange, with the overall objective of building a larger and sustainable Inuit environmental workforce.

In 2019, TMAC continued to operate in compliance with its existing Project Certificate No.003 and No. 009, Water Licences, Framework Agreement, and other obligations and authorizations. Water use in 2019 was below approved limits, with the vast majority of industrial water recycled from the reclaim pond of the Tailings Impoundment Area, greatly reducing the amount of fresh water drawn from Doris Lake.

TMAC continued the collection of monitoring and baseline data for the Project during 2019. Baseline data and impact predictions are provided in the respective environmental impacts statements and data

continues to be collected in construction and operations. From both a biophysical and socio-economic environment perspective, monitoring results in 2019 continue to show impact predictions remain valid, there have been no significant adverse effect observed on Valued Components from the Project, and mitigation measures are continuing to prove successful. TMAC is pleased to provide the necessary information under this cover that supports our compliance to Project Certificate No. 003 and 009 and look forward to maintaining and growing positive relationships within the Kitikmeot Region.



IEAC June 28, 2019 Meeting Attendees.

[illegible][illegible][illegible]

Aulapkaiyini Naittuq

Hope Bay Havauhikhaq (tamna Havauhikhaq) aktikkulaaqtaqtuq 20 kilamiitamik × 80 kilamiitamik uyarakhiurvinga hivuraani hinaani Melville Soundmi Nunavumi, Kaanatami. Tamna Havauhikhaq TMAC Resources-kut (TMAC) nunagilluaqtauyuk avaliittumiklu ihumagilluaqtauyuk qinirhiayunik guulumik, pivallianiq uyarakhiurniqmullu. Una taiguagakhaq ukununga Nunavut Avatilirinirmut Katimayit (NIRB) upalungaiyarhimayut ihivriuriami Havauhikhamut hulilukaarninngit munarilugillu piyait TMAC Resources-kunni (TMAC) ittut Havauhikhaq Naunaitkutarinirinnaga Nampanga 003 uumunnga Doris Havauhikhaq unalu Havauhikhaq Naunaitkutarinirinnaga Nampanga 009 uumunnga Madrid-Boston (Havaariyanga 2) Havauhikhaq.

2019mi maniliurahuarniqmut aulapkaihimmaqtut Doris-mi akhuurhimmaqhutik angikliyuumiqtumik angikliyuumiqtiglugit piliurninnga angikligiami ore-mik qaffiraaluk ihuarhilugulu gold-mik pifaarninnga.

Angiyunik iliurainiq hulilukaarutingit ilaliutihimayuk iniqtirinnga nappaqtirninnga uumannga Roberts Bay Imaiurvinganik (RBDS) iliuraininnganiklu uumannga piyut nunap ataanut uyarakhiurvik imaiyarninnga unalu Uyarakhiurviup piluryangit Umikvinga (TIA) imaiyurvinga turhuangit puplautikkut tunngavinga. Tamna RBDS ikayuqtait imaiyarninnga uumannga Doris uyarakhiurvik piiyairninngalu ilakunik imanga TIA-tkunnit Roberts Bay-mut. Tariunga imaiyurvinga turhuangit nakuuyumik iliuraqtauyut Roberts Bay-mut Atauttimut Pittailihimayuk Naptuyunik uumannga nunap ataanut uyarakhiurvik imaq Doris-imaiyaqtinnagu RBDS-kunnut. Imaiyangittut Roberts Bay-mut 2019mi. Doris uyarakhiurvikmi atauhiq nayugangani ilaliutiyuk pipkaidjutigiami aadlamik 48nik iglikhanik Roberts Bay-milu aadlamik 5 millianik liitanik urhuryuaqarvikhaliutut uumani Urhuryuaqmut Tutquumavingani unalu Munarivingani.

Earthworks pilihaaliqtut Madrid North uyarakhiurvingani ikayuriami aulapkaininnga uyarakhiurniqmik of uumannga Naartok East Crown Pillar-mit uumanngalu Madrid North nunap ataanut nunguliqtut. Una ilaliutihimayuk nappaqtirninnga uumannga hivulliqpaaq kilamiitamik uumannga Madrid North ukiuq tamaat apqut-weather, tamna Madrid North Pipkaidjutinga Imaq Tahiraq, unalu nappaqtirninnga uumannga Madrid North Iqakkukhat Uyaqqanik tutquumavinga. Piiyaqtauyut inikhangit apqutikhallu piliuqtauyut ikayuriami akhaluutiqarvinginnut, nirivingit/havakvingit akhaluutininik uarutiqarvingalu. Qaliriikpiaqhimaninnga piliuqtuq tutquriami qaliriikpiaqtut unguvaqtauyut uyarakhiuqtillugit uumannga Naartok East Crown Pillar-mit.

Ukiakhami, TMAC ilaliutiyuk aadlamik nakuuqpiyaqtumik umiakkut agyaqtut unalu niuviqtuq agyaqtuqlu urhuquyamik hunavalukniklu ikayuriamikni uyarakhiurniq piluryaktirniqlu uyaqqanik. Umiakkut agyarniq ilaliutihimayuk aadlanik akhaluutiryuanik hunavalukniklu ikayuriami uyarakhiurniqmut nappaqtirninnga aulapkaininnga.

Uqaqatigiikniq 2019mi ilaliutihimayuk malruuknik katimapkaiyut ukununga Inuit Avatiliriniqmut Ihivriurniqmut Katimayinngit (IEAC). Ihumagilluaqtangit hapkuat katimaniq hivumuupkariami Iqalukhiurniqmut Maniiyangittumik Ihumaliurniq havaklunilu havaktaarniqtumik tuktunik munarinuq piyuq uumunnga Madrid-Boston Havauhikhaq. Katimaniq nakuuyumik piyuq uqaqatigiikniqmut tikinnahuarutingit pigiamilu titirariamiklu qanuqtut ihumagiyangit IEAC-kunnit piniaruknaqhiunik iqalukhiurniqmut tuktuniklu munarininnganut. TMAC aullaqtiqtaallu pittaarniqmut piliurniq pinahuarut ukununga Inuit Avatiliriniqmut Ikayuqtingit havaktut Hope Bay-mi. Tamna pinahuarut nakuuyumik piyuq titiraqinnganik ayuiqtait havaktillutik atuliqtitauliqhugillu ikayuutininik naunaitkutanik himmautikhanginnik, tamainnut ihuaqtumik piliuriami angitqiamik ikayuutiumik Inuit avatiliriniqmut havakvinga. Tattiarnarviani, 2019, TMAC piyyut Havaamut Ilihimaninngit Katimaniq tamainni tallimani Kitikmeonmi ittut nunallaangit. Ilagiyanganik uumannga Inungnut-maniliurninnganut Munarininngit

Pinahuarutimut, TMAC ilaliutihimmaqtut Hope Bay-mut Inungnut maniliurninnganut Munariniqmut Havaqatigiiktunut (SEMWG); havaaq iniqtiqtauyuk uumunnga SEMWG 2019mi ilaliutihimayuk hivituyumik naunaipkainiq uumannga Hope Bay-mut Inungnut maniliurninnganut Munariniqmut Pinahuarut. 2019mi, TMAC akhuraaluklu ilauyuk atauhiqmi ukiumi katimayuni uumannga Hope Bay-mut Inungnut maniliurninnganut Katimayiingit piyuq Iqaluktuutiami. Unalu uumani ukiumi, TMAC iniqtiqtaa inirhimaittuq Angiqatigiingnirmut Nalunaitkutingit Nunavut Kavamatkunnut uumunngalu Kitikmeot Inuit Katimayiinginnut ihumagilluaqtait havaqatigiiktut ikayuriami hivulliutiyakhanginnik angiqatigiiktamiknik ukunatitut uyarakhiurvik ayuirhainiq amigairyuumiqtumiklu havaakhaq.

2019mi, TMAC aulapkaihimmaqtait ittunik Havauhikhaq Naunaitkutralirinngas Nampanga 003 unalu Nampanga 009, Imaq Laisingit, Tunngavikmut Angiqatigiikniq, aadlallu piyakhangit angirutingillu. Imaq aturninnga 2019mi ataani angirutimi ittut, angiyut amigaitqiyauyuk havakviup imanga atuqtauffaaqtauhimayumit tahiqlut uumannga TIA, akhuraaluk ikikliyuumiqttaa qanuraaluktut imanga piyait Doris Lake-mit.

TMAC katitirhimaqtaa munarininnganik unalu aullaqtirutinganit nampanga uumunnga Havauhikhaq 2019mit. Aullaqtirutinga nampanga pilaqutingalu itqurnarutingit tuniyauyut inmikku avatiliriniqmut pilaqutingit titiraqhimayut unalu nampangit katitirhimaqniaqtuq nappaqtirninngani aulapkaininnganilu. Tamarmit inuuhimayuni inuuhimangittunilu unalu inungnut maniliurniqmut avatiliriniqmut qanuqtut ihumagiyanginnik, munriyuq qanurittaakhaanik 2019mi naunairhimaqtaa pilaqutinga itqurnarutingit atuqtauhimmaanginnaqtuq, piqangittuq akhuurutauyumik nakuungittumik pipkaidjutauyuk tautuktait uumani Naunairhimayut Ilagiyanginni Havauhikhamit, ikikliyuumiutingillu naunairhimaqtauyuk nakuuyumik piyuq. TMAC quviahuktuq tunigiami ihariagiyauyut naunaitkutingit titiraqhimayumi uumannga ikayuqtuq angirutingit uumunnga Havauhikhaq Naunaitkutralirinngit Nampanga 003 uumanilu Nampanga 009 niriuktuq pihimagiami angikliyuumiutigiamilu nakuuyumik ilauqatigiikniq Kitikmeonmi.

Table of Contents

vii

5.2	Engagement with Inuit through the IIBA	5-2
5.3	Community Awareness: Kitikmeot Community Meetings	5-2
5.4	Community Awareness: Kitikmeot Career Awareness Sessions	5-3
5.5	Digital Media	5-3
5.6	Electronic Mail	5-3
5.7	Nunavut Event Participation.....	5-4
5.8	Stakeholder Representative Organizations	5-4
5.9	Hope Bay Mentorship Program	5-4
5.10	Community Relations Summary for 2019	5-5
5.11	Corporate Social Responsibility Activities in 2019 by Month.....	5-5
6.	Performance on Project Certificate Terms and Conditions	6-1
6.1	Doris North Project Certificate No. 003	6-1
6.2	Madrid-Boston Project Certificate No. 009	6-49
7.	Compliance with Regulatory Instruments	7-1
7.1	Annual Inspection Activities	7-1
7.2	Unauthorized Discharges and Spills	7-1
7.3	Water Licence Compliance (Type A 2AM-DOH1335, Type B 2BB-BOS1727, Type B 2BB-MAE1727, and Type B 2BE-HOP1222).....	7-1
8.	Summary of Post Environmental Monitoring Program	8-1
9.	Geotechnical Inspection Reports	9-1
10.	Management Plans	10-1
11.	Closure and Reclamation.....	11-1
11.1	Operation Areas	11-1
11.2	Exploration Areas.....	11-1
11.3	Cost Estimate	11-2
	11.3.1 Doris and Madrid.....	11-2
	11.3.2 Windy	11-2
	11.3.3 Boston	11-2
	References.....	R-1

LIST OF TABLES

Table 2-1. Key TMAC Permits/Licences and Approvals	2-3
Table 7.1-1. Summary of Annual Inspection Activities.....	7-3
Table 7.2-1. Summary of Reportable Spills in 2019	7-5
Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003.....	8-3
Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009	8-14
Table 10-1. Hope Bay Project Management Plans	10-1

LIST OF FIGURES

Figure 11.1-1. Doris Crown Pillar Recovery Trench Post-Reclamation Activities.....	11-1
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LIST OF APPENDICES

Appendix A. Concordance Table

Appendix B. Site Layouts

Appendix C. Compliance Monitoring Reports

Appendix C-1. Q1-Q3 2019 Atmospheric Compliance Monitoring Program Report – Doris and Madrid Projects

Appendix C-2. Hope Bay Project, Nunavut: Archaeological Investigations in 2019 Final Permit Report

Appendix C-3. Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Program Compliance Report

Appendix C-4. Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report

Appendix C-5. 2019 Waste Rock, Quarry and Tailings Monitoring Report, Doris and Madrid Mines, Hope Bay Project

Appendix D. Capacity Building for Inuit Environmental Field Assistants - Summary of 2019 Program Results Memo

Appendix E. Status Update with Project Certificate Commitments

Acronyms and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

AEMP	Aquatic Effects Monitoring Program
BTD	Below the dyke
CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CSR	Corporate Social Responsibility
DCN	Doris Central
DCO	Doris Connector
DFO	Fisheries and Oceans Canada
DNO	Doris North
ECCC	Environment and Climate Change Canada
EFAP	Employee and Family Assistance Plan
ERM	ERM Consultants Canada Ltd.
FEIS	Final Environmental Impact Statement
ft	Foot
FTE	Full-time equivalent
GHG	Greenhouse gas
GN	Government of Nunavut
GN-DCH	Government of Nunavut - Department of Culture and Heritage
GN-DoE	Government of Nunavut - Department of Environment
GN-ED&T	Government of Nunavut - Department of Economic Development and Transportation
HBML	Hope Bay Mining Ltd.
HBSEWG	Hope Bay Socio-Economic Working Group
IEAC	Inuit Environmental Advisory Committee
IIBA	Inuit Impact and Benefits Agreement

IPGs	Institutions of Public Government
KC	Kitikmeot Corporation
kg	Kilogram
KQB	Kitikmeot Qualified Businesses
K-SEMC	Kitikmeot Socio-Economic Monitoring Committee
m	Metre
MCC	Motor Control Centre
MHBL	Miramar Hope Bay Ltd.
ML	Million litres
MDMER	Metal and Diamond Mining Effluent Regulations
MMER	Metal Mining Effluent Regulations
MOU	Memorandum of Understanding
N/A	Not applicable
NECPT	Naartok East Crown Pillar Trench
NHC	Nunavut Housing Corporation
NIRB	Nunavut Impact Review Board
NPC	Nunavut Planning Commission
NSRT	Nunavut Surface Rights Tribunal
NTI	Nunavut Tunngavik Incorporated
NWB	Nunavut Water Board
NWMB	Nunavut Wildlife Management Board
L	Litre
OPEP	Oil Pollution Emergency Plan
OPPP	Oil Pollution Preparedness Plan
Project	Hope Bay Project
RBDS	Roberts Bay Discharge System
SEMP	Socio-Economic Monitoring Program
SEMWG	Socio-Economic Monitoring Working Group
SNP	Surveillance Network Program

SRK	SRK Consulting
t	Tonne
TIA	Tailings Impoundment Area
TMAC	TMAC Resources Inc.
TSP	Total suspended particulate
TSS	Total suspended solids
VEC	Valued Ecosystem Component
WMMP	Wildlife Monitoring and Mitigation Plan
WSCC	Workers' Safety and Compensation Commission

1. Introduction

The Hope Bay Project (the Project) is TMAC Resources Inc. (TMAC) prime holding and is its sole focus for exploration, development and mining. TMAC holds mineral claims, leases and one Inuit Mineral Exploration Agreement that comprise an approximately 20 × 80 km property. These mineral holdings comprise the Project, on which the primary gold deposits Doris, Madrid North, Madrid South and Boston are located. The Project is located east of Bathurst Inlet, approximately 150 km southwest of Cambridge Bay in western Kitikmeot, Nunavut, and 700 km northeast of Yellowknife. The nearest settlements are Omingmaktok, located approximately 60 km to the west, and Kingaok (Bathurst Inlet), located 130 km southwest. Both Omingmaktok and Kingaok are historical settlements; past residents have moved to Cambridge Bay or other communities, although the settlements continue to be used seasonally.

1.1 PROJECT BACKGROUND

The Nunavut Impact Review Board (NIRB) issued the initial Project Certificate for the Project to Miramar Hope Bay Ltd. (MHBL) on September 15, 2006. On November 26, 2007, NIRB issued an appendix to the Project Certificate, *Appendix D - The Doris North Gold Mine Monitoring Program*, to Miramar which provided, in part, that MHBL is to submit an annual report for each year the Doris North Gold Mine Project is in operation until the post closure phase, and sets out specific information requirements for the annual report. In December 2007, Miramar assigned all assets and liabilities it had related to the Hope Bay district, including its rights and obligations to the licence and the Doris North project, to a new business entity called Hope Bay Mining Ltd. (HBML). On December 21, 2007, Newmont Mining Corporation (Newmont) successfully purchased the controlling interest of Miramar, HBML's parent company. The assignment of the various licences and permits from MHBL to HBML was completed in early 2008. In March 2008, Newmont completed the acquisition of 100% of the shares of Miramar and its subsidiaries, and therefore assumed all responsibility for the Doris North project.

In September 2008, Newmont decided to officially defer the Doris North underground operation as a stand-alone project. This deferral was maintained until the fall of 2009. The NIRB was notified by letter on November 10, 2009 of HBML's intent to proceed with the Doris North Project. In 2010, HBML continued with the construction of Doris North infrastructure and advanced exploration. On January 31, 2012, Newmont announced that it would put the project into indefinite care and maintenance. In early 2013, Newmont sold the project to TMAC and assigned all assets and liabilities relating to the project to TMAC. The Project Certificate was assigned to TMAC on April 11, 2013. In 2015, TMAC resumed construction of the Doris North Project in preparation for mining and milling.

On June 23, 2015, TMAC applied to the NIRB to reconsider the terms and conditions in the Project Certificate to allow additional activities outlined by its 2015 Amendment Application. In 2015 Amendment Application, TMAC extended the mine life for the Project from a two (2) year period of operations to six (6) years through mining two (2) additional mineralized zones (Doris Connector and Doris Central zones) to be accessed via the existing portal. The expanded mining program would also increase the approved mining and milling rates to 2,000 tonnes per day, and require the restructuring of the Tailings Impoundment Area to be managed as subaerial tailings with treated effluent being transported via a pipeline for discharge into Roberts Bay. On September 23, 2016 the Board recommended that the amendment activities be allowed to proceed, and the Project will be subject to the Terms and Conditions of the revised Project Certificate No. 003.

In 2018, TMAC received permission to commence the Madrid-Boston (Phase 2) project subject to the Terms and Conditions of the Project Certificate No. 009. The scope of activities for the Madrid-Boston portion of the Project includes mobilization, construction, operation, closure, reclamation, and post-closure monitoring of three (3) gold mines along the Hope Bay Property, referred to as the Madrid North, Madrid South and Boston. After completing the review of the final environmental impact study, the Nunavut Impact Review Board issued a recommendation to the Ministers of Crown-Indigenous Relations and Northern Affairs Canada for approval of a new Project Certificate for the Madrid and Boston mines, which approval was granted on November 12, 2018. The final permitting for the Madrid and Boston projects was completed on January 14, 2019 with the approval of two Type A Water Licence as recommended by the Nunavut Water Board (NWB) on December 7, 2018.

Throughout 2019, TMAC was operated under both revised Project Certificate No. 003 and Project Certificate No. 009. This annual report and supporting appendices provide the Project's position in 2019 in relation to the applicable Terms and Conditions included in both Project Certificates. During 2020, TMAC plans to continue to demonstrate compliance with the various regulatory requirements applicable to the Project while maintaining constrictive and positive community relationships. Environmental monitoring in accordance with the Project phase and existing Water Licences, Framework Agreement, Project Certificate, authorizations, management plans and environmental effects monitoring plans will continue.

2. Regulatory Framework and Legal Matters

The territory of Nunavut was created on April 1, 1999 through the Nunavut Agreement. Nunavut is made up of three Regions: Kitikmeot, Kivalliq, and Qikiqtani. The Hope Bay Project is in the Kitikmeot Region. At present, the regulatory process for mineral resource development in Nunavut is co-managed by the Government of Canada, Nunavut Tunngavik Incorporated (NTI), Regional Inuit Associations such as the KIA, the Government of Nunavut (GN), and Institutions of Public Government (IPGs). Each has specific mandates and responsibilities, however, there is some overlap. The five IPGs that were created through the Nunavut Agreement to manage various aspects of project development within Nunavut are:

- Nunavut Impact Review Board (NIRB);
- Nunavut Planning Commission (NPC);
- Nunavut Surface Rights Tribunal (NSRT);
- Nunavut Water Board (NWB); and
- Nunavut Wildlife Management Board (NWMB).

Currently an approved land use plan is not in place for the Kitikmeot Region in which the Project is based and as such a review of applications relating to the Project is not required by the NPC. Once an approved land use plan is in place, NPC will carry out an initial review to determine compliance of proposed project applications.

The environmental assessment process is run by the NIRB. The Nunavut Agreement sets out the environmental assessment process for Nunavut and the requirements for the NIRB to conduct screenings and reviews. Once the process is complete and approved, the NIRB issues a Project Certificate that sets out the terms under which the project can proceed and related project approvals can be issued. Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), amongst others, participates on behalf of the Government of Canada as an intervener in the Project Certificate process and, once issued, supporting enforcement of the terms and conditions of the NIRB Project Certificate(s). In relation to its current operation, TMAC currently holds two (2) Project Certificates from the NIRB as summarized in Table 2-1.

The NWB is responsible for issuing water licences that allows the use of water and deposit of compliant effluents into water. Like the NIRB process, CIRNAC participates as an intervener in the licensing process and, once issued, enforcing the terms and conditions of the NWB water licence(s). The NWB, through the water licensing process, may identify additional legislation and regulations governing waters that may be applicable. In relation to its current operation, TMAC currently holds five (5) Water Licences from the NWB as summarized in Table 2-1.

The Nunavut Agreement requires the establishment of legislation for land use planning and environmental assessment. The *Nunavut Planning and Project Assessment Act* formally establishes the NIRB and the NPC in legislation, describes in detail the processes under which they operate, and provides timelines which are expected to provide additional predictability and certainty for developers such as TMAC.

The current federal Acts and Regulations that most commonly apply to mining projects in Nunavut include the following:

- *Aeronautics Act*, Canadian Aviation Regulations;
- *Arctic Waters Pollution Prevention Act*, Arctic Waters Pollution Prevention Regulations;

- *Canada Shipping Act*;
- *Canada Transportation Act*, Ammonium Nitrate Storage Facilities Regulations, Flammable Liquids Bulk Storage Regulations;
- *Canadian Environmental Protection Act*;
- *Explosives Act*;
- *Fisheries Act*, and Regulations, including Metal and Diamond Mining Effluent Regulations;
- *Greenhouse Gas Pollution Pricing Act*, and Regulations;
- *Migratory Birds Convention Act*, and Regulations;
- *Navigation Protection Act*;
- *Nunavut Land Claims Agreement Act*;
- *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;
- *Species at Risk Act*;
- *Territorial Lands Act*; and
- *Transportation of Dangerous Goods Act*, and Regulations.

The Nunavut legislation that most commonly apply to projects in Nunavut includes the following:

- *Apprenticeship, Trades and Occupations Certification Act*;
- Building Codes;
- *Business Corporations Act*;
- *Emergency Medical Aid Act*;
- *Engineers, Geologists and Geophysicists Act*;
- *Environmental Protection Act*, Spill Contingency Planning and Reporting Regulations;
- *Explosives Use Act*, Explosives Use Regulations;
- *Fair Practices Act*;
- *Fire Prevention Act*, Fire Prevention Regulations;
- *Historical Resources Act*;
- *Human Rights Act*;
- *Information and Protection of Privacy Act*;
- *Labour Standards Act*;
- *Mine Health and Safety Act*, Mine Health and Safety Regulations;
- *Nunavut Planning and Project Assessment Act*;
- *Occupational Training Agreements Act*;
- *Public Health Act*, Camp Sanitation Regulations;
- *Scientist Act*;
- *The Safety Act*;

- *Transportation of Dangerous Goods Act*, Transportation of Dangerous Goods Regulations;
- *Wildlife Act*; and
- *Workers Compensation Act*.

A listing of the key regulatory instruments that allowed for work to be completed in 2019 for the Project is provided in Table 2-1.

A concordance table demonstrating compliance with annual reporting requirements of Project Certificate No. 003 is provided in Appendix A of this report.

Table 2-1. Key TMAC Permits/Licences and Approvals

Name	Approval No.	Scope / Purpose	Term / Duration	Expiration Date
NIRB Project Certificate	009	Authorization for Madrid-Boston to proceed, provided certain conditions and requirements are incorporated in the various regulatory permits and authorizations issued by the regulatory agencies with permitting authority for the Hope Bay Project. The Project includes the construction of all required surface Infrastructure and operation of three new mines at Hope Bay: Madrid North, Madrid South and Boston.	Life of Doris Project	None
	003	Authorization for Doris to proceed provided certain conditions and requirements are incorporated in the various regulatory permits and authorizations issued by the regulatory agencies with permitting authority for the Hope Bay Project.	Life of Doris Project	None
NWB Type A Water Licence Amendment No. 2	2AM-DOH1335	Water Licence for Doris and Madrid project that authorizes the construction, operation and reclamation of the Doris, Madrid and the all- weather road of the Hope Bay Project. Licence scope includes Amendment No.1.	22 years	March 2035
NWB Type A Water Licence Amendment No. 1	2AM-DOH1323	Water Licence for Doris with a 10-year term that authorizes the construction, operation and reclamation of the Doris Project. Licence was renewed (with certain amendments) in November 2016. - Superseded by Amendment No. 2 2AM-DOH1835.	10 years	August 2023
NWB Type A Water Licence Amendment	2AM-BOS1835	Water Licence for the Phase 2 Boston Site that authorizes the construction, operation and reclamation of the Boston Project.	17 years	March 2035
Type B Water Licence for the HBVB including a camp at Windy Lake	2BE-HOP1222	Water Licence that allows for the use of water and disposal of waste associated with regional exploration program including drilling and camp operations.	10 years	June 2022

(continued)

Table 2-1. Key TMAC Permits/Licences and Approvals (continued)

Name	Approval No.	Scope / Purpose	Term / Duration	Expiration Date
Type B Water Licence for bulk sample exploration at Boston	2BB-BOS1727	Water licence that allows for the use of water and the disposal of waste for the Boston Advanced Exploration Project. Licence was renewed in July 2017, was formerly 2BB-BOS1217.	10 years	July 2027
Type B Water Licence for Madrid Advanced Exploration Amendment No. 2	2BB-MAE1727	Water licence that allows for the use of water and the disposal of waste for an undertaking classified as Mining and Milling as per Schedule II of the Regulations for the Madrid Advanced Exploration Project (Amended in 2018).	10 years	May 2027
Framework Agreement		Framework Agreement provides comprehensive land tenure governing the issuance of surface exploration licences, advanced exploration leases, commercial leases, and compensation associated with tenure. Framework Agreement includes a project-wide Land Use Licence, an Inuit Impact and Benefits Agreement (IIBA) and a Water and Wildlife Agreement. Framework Agreement was signed in March 2015 for project-wide land tenure.	20 years	March 2035
Water and Wildlife Agreement		Included as a Schedule to the Framework Agreement, this Agreement details compensation to be provided to the KIA and Inuit beneficiaries for negative effects that may occur to wildlife harvesting and water as a result of mining related activities across the Project.	20 years	March 2035
Amended and Restated Inuit Owned Lands Commercial Lease	KTCL 313D001	Commercial Lease for use of designated lands associated with the Hope Bay Project. Currently, lands have been designated that encompass Doris and Madrid North. Expansion to include other areas is administrative in nature. Original Commercial Lease was amended and restated in March 2015 as a means to obtain surety of project-wide land tenure.	20 years	March 2035
Inuit Impact and Benefits Agreement		Included as a Schedule to the Framework Agreement, this Agreement details the benefits to be provided to the KIA and Inuit beneficiaries from the Hope Bay Project, including compensation, employment and contracting opportunities. The IIBA originally signed in association with Doris was revised in March 2015 and expanded in scope to encompass project-wide activities.	20 years	March 2035

(continued)

Table 2-1. Key TMAC Permits/Licences and Approvals (completed)

Name	Approval No.	Scope / Purpose	Term / Duration	Expiration Date
KIA Advanced Exploration Agreements	KTAEL15C001 KTAEL15C002	Two agreements as per the terms of the Framework Agreement enabling quarry operations at designated locations in the Hope Bay Project and advanced exploration at Boston.	5 year, automatic renewable annually thereafter for up to 20 years	March 2021
KIA Land Use Licences		Enables exploration activities across the Hope Bay Project as per the terms of the Framework Agreement.	1 year automatic renewable for 20 years	March 2021
DFO authorization	NU-02-0117.2	Construction of the jetty in Roberts Bay.	N/A	December 2009
	NU-1000-0028	Changes to the Doris jetty.	N/A	July 2012
	NU-02-01117.3	Construction of the Doris Tailings Impoundment Area (TIA) north dam.	Life of Mine	None
Navigable Waters Permit	8200-02-6565	Installation of the jetty in Roberts Bay.	N/A	N/A
	2018-600028	Approval for Jetty in Roberts Bay	N/A	N/A
	2018-600006	Approval for Marine Outfall Berm	N/A	N/A
Jetty Lease	77A3-1-2	Foreshore lease from the Crown for construction and operation of the Roberts Bay Jetty.	30 years	June 2047
Marine Outfall Berm	77A/3-3-2	Lease from Crown for construction and operation of Roberts Bay Marine Outfall Berm.	30 years	July 2048
Amendment to Schedule 2 of the Metal Mining Effluent Regulations (MMER)	Registration SOR/2008-216	Designation of Tail Lake as a tailings impoundment.	Life of Mine	None

3. Summary of Project Activities in 2019

3.1 CONSTRUCTION AND OPERATIONS

In 2019 commercial operations continued at Doris with continued efforts to stabilize mill throughput and optimize gold recovery. In 2019 the mill processed 592,932 tonnes (t) of ore and poured 137,140 ounces of gold, and successfully treated 48,709 t of cyanide solutions. The installation of the gravity concentrators was completed in 2019 which improved gold recovery. Projects such as the installation of scavenger columns and improved resin circuits began in the mill to further improve gold recovery.

Civil construction activities included the completion of construction of the Roberts Bay Discharge System (RBDS) and installation of the associated underground mine dewatering and Tailings Impoundment Area (TIA) discharge pipelines and pumping infrastructure. The RBDS allows dewatering of the Doris mine and removal of excess water from the TIA to Roberts Bay. The ocean discharge pipeline with sunken diffuser and recirculation pipeline were successfully installed into Roberts Bay during the open water season. As part of this system, a Water Treatment Plant was constructed to remove Total Suspended Solids from underground mine water prior to discharge through the RBDS. No discharge occurred to Roberts Bay in 2019.

Earthworks began at the Madrid North site to support the commencement of mining of the Naartok East Crown Pillar and Madrid North underground decline. This included construction of the first kilometre of the Madrid North all-weather-road, the Madrid North Contact Water Pond, and construction of the Madrid North Waste Rock storage pad. Laydown space and access roads were constructed to support shop facilities, lunchroom/offices and wash car facilities. An overburden stockpile was established to store overburden removed during mining of the Naartok East Crown Pillar. A laydown was constructed adjacent to the Madrid North underground portal location, which included a lined area for ore/waste rock re-handling, shop facilities, power generator and sea can storage area.

Underground development continued at Doris in 2019 with further advancement of below the dyke (BTD) decline and necessary support infrastructure. TMAC continued ore development with long hole drilling and blasting in the Doris Connector (DCO) and BTD in Doris, and continued ore sill development in the DCO. TMAC also continued waste development of the DCO for future mining horizons. Long hole blasting continued throughout 2019, with all ore production trucked to surface and processed through the mill or added to the stockpile. Construction of the DCO Vent Raise was completed to support underground ventilation requirements. Development of the Doris Central (DCN) decline continued in 2019.

Ore development also occurred from surface in 2019 with the commencement of surface blasting and hauling of ore and waste from the Naartok East Crown Pillar Trench (NECPT). Development of the Madrid North underground decline began in Q4 of 2019.

Backfill and reclamation of the Doris Crown Pillar Trench was completed in 2019.

One dorm was added to allow an additional 48 bed spaces at Doris Camp. To accommodate increased fuel storage required for future project activities, an additional 5 million litre fuel tank was constructed at the Roberts Bay Fuel Storage and Containment facility.

In the fall of 2019, TMAC concluded another successful sealift operation including the purchase and delivery of 23,000,000 L of diesel fuel as well as explosives and reagents to support mining and milling activities. The sealift also included additional heavy equipment and supplies to support mining and construction operations.

Site layouts and aerial photos for the Belt are provided in Appendix B of this report and provide details of the existing camps, infrastructure and equipment at site.

3.2 EXPLORATION

The 2019 Exploration and Geoscience program at Hope Bay consisted of both underground and surface diamond drilling, regional prospecting, gold in till sampling and a lake-bottom sediment sampling program on Doris and Patch Lake. The 2019 exploration program at Doris included drilling high-grade targets in the BTD extension for mineral resource expansion and drilling in the DCO and DCN to support mine development. Priorities for the 2019 regional exploration program focussed on prospective targets near established or planned infrastructure where successful exploration would influence future economic development on the belt.

Exploration activities operated throughout the year on the Hope Bay belt. An ice drilling program was conducted at the Madrid deposit on Patch Lake from January to April and included an ice portage program at the Madrid pit from January to February 2019. In May 2019, exploration began a regional drill program in areas proximal to the Doris deposit. Once complete at Doris, regional exploration transitioned to mid-belt targets, in preparation for drilling to operate out of Boston camp. In June, all exploration personnel moved to Boston camp once the site was operational. Operations at Boston included camp support personnel, contractors and TMAC employees. Exploration activities were heli-supported from June until November and included diamond drilling, regional prospecting and till sampling programs. Boston camp was decommissioned for season from December, 2019 to January, 2020.

A total of 75,849 metres in 469 diamond drill holes, 135 regional prospecting samples, 1,267 glacial gold in till samples and 97 lake sediment samples were obtained in 2019.

3.2.1 Drilling

Underground diamond drilling at Doris operated continuously throughout 2019. The diamond drilling program focused on expansion drilling in the high-grade zones within the Doris BTD and infill drilling within the DCO, DNO, and DCN to support detailed mine planning. A total of 375 underground diamond drill holes, totalling 43,860 metres was completed in 2019.

TMAC contracted Geotech Drilling Services Ltd. to complete the diamond drilling on the Hope Bay Belt for both underground and surface operations in 2019. On surface, no drill setup or associated items were placed within 31 metres of any waterbody during the open water season and no spills were reported into water bodies. Water quality monitoring was performed on runoff from drill sites and water used for drilling to ensure the respective Water License Criteria were met. Drill cuttings and mud were contained within a recirculation system and were transported and stored in approved containment areas including the TIA at Doris.

Surface diamond drilling activities for the 2019 Exploration and Geoscience program occurred between January and November within the Hope Bay Belt. Diamond drilling focused on regional targets proximal to the Doris, Madrid and Boston deposits. Regional targets drilled outside of these deposits were planned along proposed infrastructure routes to promote potential economic development of near infrastructure. A winter drilling program was conducted between January and April 2019, with drill rigs positioned on Patch Lake as well as on land within the Madrid pit area. Ice portages were built when necessary and rigs were pulled with a D6 dozer and telescopic handler. During the summer/fall season between May and November, drill rigs were situated in heli-portable shacks and positioned with the support of helicopters. All drill sites on surface were reclaimed following the decommissioning of drills. A total of 94 surface diamond drill holes, totalling 31,989 metres was completed in 2019.

3.2.2 Regional Prospecting Program

A regional prospecting program was completed on the Hope Bay belt in 2019. Prospecting and reconnaissance involved structural and geochemical mapping in conjunction with grab sampling in various areas. The purpose of this program was to follow-up on historical showings and mineral occurrences within the Belt and better understand the geology and geochemical signature of current and potential drill targets.

In relation to ground disturbance, prospecting is a very low impact exploration method. Grab samples are collected with the use of a standard geologist hammer on outcrops or boulders of interest. Sample sizes ranged between 0.5 and 3 kilograms and were submitted for analysis. A method of non-destructive testing was implemented for use in the field programs during the 2019 field season. Use of a portable x-ray fluorescent machine (pXRF) for on-site and live geochemical analysis eliminates the need for geologists to take samples from sites.

A total of 135 regional prospecting samples were collected during the 2019 regional prospecting program as grabs and channels.

3.2.3 Till Sampling Program

The 2019 till sampling program was completed during snow-free months from June to September while tundra and outcrops were exposed. These programs focused on exploration outside of the main deposit areas, in effort to test the potential for additional mineralization. The sampling program was designed to test for down-ice flow anomalies within the glacial material transported during the last glaciation. This type of systematic sampling enabled for testing of covered valleys for potential mineralization. This program did not involve the use of heavy equipment and therefore had a minimal impact on the tundra or outcrops.

The samples were collected from a geomorphologic feature that is referred to as a frost boil. This feature represents a zone of frost related movement that transports the basal till material back to the surface of the tundra. The sampling protocols involved the collection of approximately 10 kg of till material from the frost boil. A hole was dug to remove the till, which was then sieved to remove over sized grains from the sample. Once the material was collected, the remaining silt/sand/gravel was returned to the hole and contoured to minimize impact. Typically, a hole dug for till sampling is approximately 30 to 50 centimetres in diameter and 50 centimetres deep.

A total of 1,267 samples were collected during the 2019 TMAC till sampling program.

3.2.4 Lake Sediment Sampling Program

A lake sediment sampling program was conducted for two weeks in February 2019 on Doris and Patch Lake. A two-person crew was contracted through Aurora Geosciences to complete the survey out of the Doris camp when ice thicknesses were ideal. The crew travelled every day to the field using snowmobiles with minimal disturbance to the tundra and environment.

An electric ice auger was used to bore holes through the ice. Samples were retrieved from the lake bottom using a torpedo-style sediment sampler. The sampling instrument was released at the surface of the lake and allowed to drip to the bottom and plunge through the sediment. If frozen, a butterfly vane would engage and keep the material in the barrel of the sampler. A minimum of 50 grams of lake bottom material was recovered at each station and submitted for assay and analysis.

A total of 97 samples were collected from the 2019 TMAC lake sediment sampling program; 79 samples from Doris Lake and 18 from Patch Lake. On twelve occasions in shallow areas, the lake bottom was frozen and no material was recovered.

3.2.5 Channel Sampling Program

A regional channel sampling program was completed on the Hope Bay belt in 2019. The purpose of this program was to follow-up on highly prospective drill targets to better understand the geology, structure and mineralization of veins sets. Channels were taken at the Too and Domani target areas.

Channel samples involve cutting a 1 to 2 inch by approximately 3 to 7 metre long transect into exposed and clean outcrop. Outcrop is washed with debris removed. Channels were geologically and structurally mapped and sampled for analysis. Areas of exposed outcrop were preferred for channel sampling and the tundra disturbance not required. As material is removed for sampling, a small aluminum tag and flagging tape marker are left to denote sample sites.

A total of 40 channels were sampled in 2019; 12 at Domani and 28 at Too. A length of 140.5 metres of rock was sampled for a total of 90 samples.

4. Summary of Project Plans for 2020

Note to Reader:

At time of publishing (April 2020), the COVID-19 global pandemic was occurring. Project plans for 2020 are likely to change as the situation develops. Plans below are based on planning prior to development of the COVID-19 pandemic. Therefore, the full effect of the pandemic on Project planning has not been released.

4.1 CONSTRUCTION AND OPERATIONAL WORK PLANS FOR FUTURE YEAR (2020)

The following activities are planned for the Doris site and associated permitted infrastructure for 2020.

4.1.1 Doris

- Construction of waste oil storage berm to temporarily store waste oil for backhaul;
- Construction of Millwright/Electrical shop on current Doris footprint;
- Expansion of glycol heat loop system to maintenance shops, warehouse and arctic corridor to reduce fuel consumption;
- Construction of surface wash bay facility;
- Construction of DCN Vent Raise;
- Expansion of the Doris accommodation complex;
- Construction of additional dry facilities at Doris Camp;
- Engineering of a waste management area (including landfill) in Quarry 2;
- Installation of additional contact water sumps in proximity to the Doris camp pad as per TMAC water management system; and
- Repair of tailings catch basin located west of Doris Creek.

4.1.2 Madrid

- Development of Madrid Infrastructure, access/winter roads and pads approved under the Type A 2AM-DOH1335;
- Installation of fuel tank and construction of secondary containment berm to support Madrid activities;
- Madrid North underground development;
- Installation of Madrid underground fresh air raise;
- Installation of water management sumps at Madrid North Waste Rock Pad; and
- Naartok East Crown Pillar Recovery.

4.1.3 Boston

- It is anticipated that the Boston Camp will be opened for exploration work in the summer of 2020 and kept open during the winter of 2020/2021; and
- No development is planned for Boston other than maintenance of infrastructure to support exploration and camp use.

4.2 EXPLORATION WORK PLANS FOR FUTURE YEAR (2020)

Exploration activities for 2020 will include surface and underground diamond drilling, a gold in glacial till sampling program along with regional mapping and prospecting programs. A limited regional program will be completed, however, the focus for 2020 will be on areas which have potential to impact near to mid-term production at both Doris and Madrid.

Surface diamond drilling planned for 2020 will consist of approximately 10,000 metres of regional surface exploration drilling and 12,000 metres of definition drilling on the Madrid North Naartok West zone. Regional drilling will focus on the Doris Valley area, north of the Doris deposit, and will follow-up on positive results from 2019. Surface drilling on the Naartok West zone will focus on stope definition in advance of production scheduled in 2021. Approximately 50,000 metres of underground drilling at Doris has been planned with the following three objectives: (1) continued definition drilling in the Connector, Central and BTD extension zones, (2) infill and expansion drilling to upgrade confidence and expand the BTD Extension, and (3) initial expansion drilling in the Connector BTD area. Initial drilling at Boston in 2019 returned positive results, however, the decision was made not to proceed with a 2020 Boston surface program.

5. Community Consultation

TMAC is committed to engaging positively and effectively with local communities in a manner that emphasizes respect, integrity and demonstrates a willingness to learn from experience and embrace necessary change. TMAC recognizes that maintaining engagement and community involvement is necessary throughout the mining cycle, and critical to continuous improvement. TMAC bases its approach to community involvement on the following principles:

1. Identify all Stakeholders in our operations;
2. Effectively engage Stakeholders and establish a dialogue;
3. Provide Stakeholders with means to respond to us as well as generate responses; and
4. Report to Stakeholders and regulators on our Engagements.

TMAC operates within Nunavut, and on Inuit Owned Lands. The KIA, representing the Inuit of the Kitikmeot region, advised TMAC during the IIBA negotiation process that all Kitikmeot communities are considered affected by Hope Bay. As a result, TMAC considers every Kitikmeot Inuk, and their representative organizations including the KIA to be Stakeholders in the Project. For the purposes of local community engagement, communities involved in the Project include Kugaaruk, Taloyoak, Gjoa Haven, Cambridge Bay, Umingmaktok, Kingaok and Kugluktuk, comprising the Kitikmeot region of Nunavut.

In order to effectively engage, establish and maintain a dialogue with TMAC's various local communities, TMAC has implemented a number of steps and activities designed to support two-way communication. These efforts and activities are described in the subsections below.

5.1 CAMBRIDGE BAY OFFICE

TMAC maintains an office in Cambridge Bay, which is the closest, occupied, affected community to the Project. This office was moved in 2019 to a new address at 6 Kingmik Street, Cambridge Bay, NU. The new office is centrally located in the community, furnished with bilingual signage, and accessible by the public during regular business hours. The primary purpose of this office is to facilitate community engagement. The Cambridge Bay office supports TMAC's engagement of government, regulators, intervenors, interested members of the public, employees, those seeking employment at Hope Bay and other interested parties.

Staff of the Cambridge Bay office are available to communicate directly with local Stakeholders and participate in a number of regional and territorial events that regularly occur in Cambridge Bay, thereby informing communities of TMAC operations, and actively soliciting feedback. The Cambridge Bay office is staffed by the Vice-President, Corporate Social Responsibility, a TMAC Liaison and an HR/SR Coordinator. They engage regularly with the public using two-way communications for a variety of activities including:

- Employee and public relations;
- Annual community awareness meetings;
- Regular meetings with individual Inuit job seekers;
- Recruiting and onboarding Inuit personnel;

- Regular communications with Community Liaison Officers in the Kitikmeot;
- Annual meetings between KIA and TMAC Presidents;
- Annual updating of KIA Board by TMAC Executive;
- Attendance at the KIA Annual General Meeting;
- Quarterly participation in the IIBA Implementation Committee;
- Presentation of the IIBA Annual Evaluation Report to the KIA Board;
- Regular meetings of the Inuit Environmental Advisory Committee (IEAC) in order to review environmental management and monitoring plans, discuss project related environmental issues, and obtain advice from knowledgeable Inuit on these matters;
- Meetings between TMAC staff and Kitikmeot Qualified Businesses;
- Regular meetings with relevant KIA Lands, Employment and Training and Executive staff; and
- Annual visits of the KIA Board, IIBA Implementation Committee, IEAC, and individual harvesters at Hope Bay.

5.2 ENGAGEMENT WITH INUIT THROUGH THE IIBA

In accordance with the IIBA, TMAC regularly engages Inuit on a range of matters directly as well as through the KIA. The IIBA includes the following schedules which contain specific provisions of adaptive socio-economic effect mitigation measures aimed at Kitikmeot Inuit:

- Schedule D - Training and Education Opportunities: whereby Inuit are provided support and training for opportunities at the Hope Bay Project;
- Schedule E - Employment: whereby measures and supports are provided to maximize Inuit participation in the Hope Bay Project;
- Schedule F - Business and Contracting Opportunities: whereby Inuit are provided business and contracting opportunities; and
- Schedule I - Inuit Environmental Advisory Committee: whereby Inuit have the opportunity to receive and consider information, provide advice and attempt to resolve community concerns relative to the environment and wildlife for the Hope Bay Project.

5.3 COMMUNITY AWARENESS: KITIKMEOT COMMUNITY MEETINGS

TMAC undertakes regional consultation tours of the Kitikmeot region. The tours consist of visits to each Kitikmeot community by TMAC community relations staff and relevant subject matter experts. TMAC endeavours to schedule the tour for a time of year that promotes participation and provides at least two weeks advanced notice for each Kitikmeot community. During the public meeting, TMAC delivers a presentation that provides the public information on the socio-economic and environmental performance of the Company. TMAC supports public meeting proceedings with simultaneous translation consistent with the dialect of Inuktitut used in each community. TMAC logs meeting participants for future reference. In the meetings, community members have an opportunity to make comments, ask questions, and raise any concerns they may have regarding TMAC operations. TMAC documents the proceedings of public meetings in order to track issues and follow up on any concerns.

During the regional consultation tours of the Kitikmeot region, TMAC also endeavours to schedule meetings in each community with specific Stakeholder groups such as Kitikmeot Hamlet Councils and/or

senior management, local Nunavut Arctic College and High School classes as specific Stakeholders that may have an interest in employment and training at TMAC.

In October 2019, TMAC planned and hosted where possible community meetings in Kugluktuk, Cambridge Bay, Kugaaruk, Taloyoak, and Gjoa Haven. The community meetings purpose was to provide an update on Human Resource related issues including jobs and skills training. Meetings included representatives from key contractors on site to speak to opportunities in organizations in addition to TMAC.

5.4 COMMUNITY AWARENESS: KITIKMEOT CAREER AWARENESS SESSIONS

TMAC hosts community and information and career awareness sessions in all Kitikmeot communities regularly in order to maximize Inuit employment opportunities at Hope Bay. The purpose of these sessions is to provide information on:

- expected labour needs of Hope Bay;
- the skills, behaviours and qualifications required for employment and advancement at Hope Bay;
- the training opportunities and educational support programs available to prepare for employment at Hope Bay; and
- career opportunities in related fields such as science, technology, mathematics or professional services.

5.5 DIGITAL MEDIA

TMAC maintains various digital media platforms including a company website and Facebook TM page. The company website (www.tmacresources.com) is easily located via internet search providers and provides company contact information, an overview of operations, company policies, and public financial filings.

TMAC uses its Facebook TM page to both share operational information with communities and increase awareness of mining. TMAC uses its Facebook TM page to augment information distributed through TMAC's website. TMAC also makes use of Kitikmeot community Facebook TM pages to advertise job postings, meeting notices, and any other news that may be of interest to Nunavut Stakeholders:

<http://www.facebook.com/tmacresources/>

Comments, questions or concerns received via social media are addressed promptly in a manner consistent with public meetings. TMAC information from this social media source is growing and it may be surmised that many younger Kitikmeot residents make better use of this information source than Elders or others more typically reliant on information received during public meetings.

5.6 ELECTRONIC MAIL

TMAC maintains and periodically updates a listing of electronic mail addresses of Stakeholders, including select community members. This listing includes, but is not restricted to the following:

- Public elected officials;
- Inuit elected officials;
- Relevant federal and territorial regulator employees;
- Relevant Inuit Organization employees;

- Relevant municipal officials; and
- Relevant training and employment agency employees.

When necessary, TMAC distributes electronic mail messages to this listing to inform them of TMAC related events, news and happenings. This engagement activity is conducted to ensure that Stakeholders and communities are well informed and if willing, able to plan participation in any future TMAC engagement.

5.7 NUNAVUT EVENT PARTICIPATION

TMAC ensures it is well informed of key events that occur on an annual basis in Nunavut that represent opportunities for community involvement and dialogue. TMAC makes staff available to attend these events in order to foster communication. These events generally include the following:

- Northern Lights Conference;
- Kitikmeot Mayor's Meeting;
- Kitikmeot Trade Show; and
- Nunavut Mining Symposium.

5.8 STAKEHOLDER REPRESENTATIVE ORGANIZATIONS

TMAC recognizes that one of the most effective means of engagement and dialogue with Stakeholders and communities is joining with them in an organization of mutual benefit. Towards this aim, TMAC is a member of established organizations involving numerous community members. TMAC's participation in these groups provides members with information on TMAC's activities and, allows them to discuss matters of mutual concern, and undertake initiatives of mutual benefit. These organizations include the following:

- NWT/Nunavut Chamber of Mines;
- Nunavut Mine Training Roundtable; and
- Kitikmeot ASETS Stakeholder Working Group.

5.9 HOPE BAY MENTORSHIP PROGRAM

TMAC's Capacity Building Program for Inuit Environmental Field Assistants was initiated in 2019. ERM provided consulting expertise throughout the initiative. In particular, TMAC is interested in supporting the development of the Inuit Environmental Assistants with focused training during employment, to bridge the training gap and increase local capacity with practical coaching and experience in environmental field work. Ultimately, the significant value in the program is its ability to expose Inuit workers to a wide range of potential environmental career opportunities and generate local technical expertise and leadership. Environmental compliance work that is required on-site at Hope Bay provides a great opportunity to develop and implement a coaching program focused on the interests and training needs of Inuit workers. Such a program would ideally lead to further Inuit employment and business opportunities and expand the network of skilled resources in the Kitikmeot Region. Activities undertaken this inaugural year included: 1) program planning and development; 2) program implementation; 3) consolidation of 2019 program results; and 4) program planning for 2020. A memo outlining this program is included in Appendix D.

5.10 COMMUNITY RELATIONS SUMMARY FOR 2019

During 2019, Julia Micks, EVP of Human Resources for TMAC, continued to head the community involvement team. Alex Buchan, VP of Corporate Social Responsibility (CSR) based in Cambridge Bay, is primarily responsible for delivering community involvement activities. The Community Relations team in Cambridge Bay includes Ikey Evalik, Inuit Impact and Benefit Agreement Coordinator, and Sandra Eyegetok, the HR/SR Coordinator.

During the course of community engagement activities, TMAC continues to experience a measured degree of support for our mining and exploration operations, and a strong and growing interest in permanent employment and training opportunities related to mine production. Over 700 Kitikmeot residents have applied for work at Hope Bay through our Cambridge Bay office to date. This represents the majority of persons in the Kitikmeot Regional Labour Force that are actively looking for work.

5.11 CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES IN 2019 BY MONTH

January

- CSR assisting in obtaining letters of support from Kitikmeot leaders and groups for Tuglik Energy Hope Bay alternative energy Natural Resources Canada funding proposal.
- Selection of two Nunavut Mining Symposium Youth Ambassadors initiated.
- IIBA Inuit Capacity meeting held to discuss Government of Nunavut (GN) Memorandum of Understanding (MOU), feedback provided to GN on proposed agreement, vetted by KIA.
- TMAC is a premier sponsor of the Kitikmeot Trade Show: <https://kitikmeottradeshow.ca/>.
- Two site-based contract managers scheduled to attend with SR staff to promote Inuit contracting.
- Coordinated IEAC scheduled for February 26-27 in Cambridge Bay with topics to include Fisheries Offsetting and Aquatic Effects Monitoring.
- Group email activity summary sent to northern stakeholders.

February

- KIA Board Site visit not be completed due to weather - a teleconference meeting was held instead involving Board Member and President.
- Two letters of support obtained or Wind Turbine funding proposal.
- Analysis and preparation conducted for first IIBA Implementation Committee scheduled for March.
- Inuit Employment and Training Targets to be set.
- Discussions held with Government of Nunavut on draft Memorandum of Understanding.
- Group email activity summary sent to northern stakeholders.

March

- CSR staff participated in the 2019 PDAC conference, which included meetings with contractors to discuss Inuit employment and training, and also a Hope Bay IIBA meeting with KIA.
- 2019 Inuit Employment Target set again at 70 Inuit FTEs.
- KIA and TMAC met with Government of Nunavut Economic Development officials to further talks aimed at producing a draft MOU between the parties.

- Presentation delivered to Kitikmeot Contractors workshop in Cambridge Bay, to provide advice and direction on Hope Bay contracting including instructions on how to register as a Kitikmeot Qualified Business.
- CSR attended Canadian High Arctic Research Station Steering Committee meeting in Cambridge Bay to provide briefing on TMAC compliance studies.
- Introductory meeting with new Cambridge Bay based federal Water Inspector to provide orientation to Hope Bay.

April

- CSR participated in the 2019 Nunavut Mining Symposium which included participation in the sponsored Youth Ambassador Program. Other engagements during this event included:
 - Donation to Auction Night;
 - Talk during Reception;
 - KIA Supper (Meeting of Presidents);
 - Several engagements with potential suppliers;
 - Panel discussions on Inuit Employment and Training;
 - GN-DoE Wildlife Monitoring meeting;
 - Nunavut Mine Training Roundtable; and
 - GN-ED&T and KIA meeting on a MOU between the parties.
- Delivered 2018 Hope Bay Socio-Economic Monitoring Report to Hope Bay Socio-Economic Working Group and Kitikmeot Socio-Economic Monitoring Committee during meetings held in Cambridge Bay.
- Physical office move completed to new Office location with some facility deficiencies outstanding at month end (Fire Alarm Panel and other electrical).
- Group email activity summary sent to northern stakeholders.

May

- CSR conducted an open house event at the Cambridge Bay office on May 15. Twenty-five members of the public attended. Many of the visitors had never attended a TMAC public meetings in the past. Based on this, the open house event is considered a success.
- A teleconference meeting of the Hope Bay Socio-Economic Monitoring Working Group was held this month in order to complete the review of the 2018 Hope Bay Socio-Economic Monitoring Report. This report was approved by the Parties and subsequently submitted to the Nunavut Impact Review Board.
- CSR staff delivered two IIBA Orientation presentations to TMAC main office staff. Further follow up presentations are planned for site-based staff.
- CSR continued to support the Environment Department in its engagement with the Department of Fisheries and Oceans with the intent of developing a Phase II Fisheries Offsetting Plan.
- Group email activity summary sent to northern stakeholders.

June

- CSR staff Supported TMAC participation in an Andrew Scheer visit to Iqaluit including a meeting with economic leaders of the territory to discuss northern industrial priorities.

- 2019 TMAC High School Achievement Award recipients identified and planning initiated for summer site visit.
- Liaised between Search and Rescue officials and site staff twice this month in order to offer TMAC resources to community search efforts. In both cases missing harvesters were found prior to Hope Bay helicopters entering the search effort.

July

- CSR undertook preparations for the 2019 TMAC High School Student Achievement Awards this month by ordering Plaques and Cheques, scheduling a mine site visit, and beginning to secure parental permission for same.
- CSR staff worked with regulators in reference to a grizzly bear deterrent matter at Doris Mine this month, to ensuring information flow.
- CSR staff delivered a Hope Bay update presentation to the Kitikmeot Inuit Association Board of Directors in Kugluktuk this month. Two questions by Board members were responded to, results shared with TMAC Executive.
- CSR staff assisted ERM contract biologists continue their Freshwater Creek fisheries offsetting research this month including marshalling equipment and securing a field assistant.
- CSR staff facilitated a dialogue between Kitikmeot Corporation (KC) and Site staff over the disposition of core box materials stored at a KC facility in Cambridge Bay.
- Group email activity summary sent to northern stakeholders.

August

- CSR staff, in support of site staff, conducted the 2019 TMAC High School Student Achievement Awards Site visit this month. A total of 11 students participated, including several that were too young to attend in 2018. The visit can be considered successful as students provided overwhelmingly positive feedback and several requested information on TMAC careers.
- CSR staff assisted ERM contract biologists continue their Freshwater Creek fisheries offsetting research in August. This included field work as the Hunters and Trappers Organization contracted field assistant was unavailable for several days.

September

- CSR staff engaged with GN ED&T staff to move the MOU negotiation process forward this month; affected GN departments are now reviewing a final draft of the MOU.
- CSR staff continued preparations for the 2019 Career Awareness tour this month, planned for the first week in October.
- CSR staff assisted Finance and Operations staff in preparing for the renewal of the camp service contract at the end of 2019 in accordance with Schedule F of the Hope Bay IIBA.
- CSR staff provided input into the Hamlet of Taloyoak Community Economic Development planning process, providing advice on how this community could increase Hope Bay employment.
- CST staff assisted ERM contract biologists continue their Freshwater Creek fisheries offsetting research in August. This included field work as the Hunters and Trappers Organization contracted field assistant was unavailable for several days.

October

- CSR staff attended a workshop in Cambridge Bay conducted by Makigiaqta Corporation looking at improvements to the Nunavut Education system in support of Inuit employment and training. The importance of trades related high school coursework and addressing non-attendance was emphasized.
- CSR staff continued preparations for upcoming events such as site based federal voting supports for employees, the 2019 Career Awareness Session Tour and a workshop to be held in Cambridge Bay related to icebreaker regulation.
- CSR staff lead efforts to divest five C-cans full of drill core box material, sufficient to build 9,500 core boxes, stored in Cambridge Bay remaining from a Newmont local construction pilot project.

November

- CSR Staff attended a Nunavut Planning Commission public hearing in Cambridge Bay this month focused on details of the 2016 Draft Nunavut Land Use Plan. Discussion included a review of instituting large caribou special management areas. A case was made, supported by the local Hunters and Trappers Organization to instead require mobile caribou protection measures similar to what is in place within the Hope Bay Wildlife Mitigation and Monitoring Plan.
- CSR staff attended the 2019 Yellowknife Geoscience Forum which included the Annual General Meeting of the Nunavut and NWT Chamber of Mines. A side meeting was held with senior officials of the Government of Nunavut to promote investor confidence in the territory. Items discussed included the Mary River environmental review and potential uses of Nunavut carbon tax revenue. A case was made to use these funds to financially support mine alternative energy projects.
- The Sustainability Policy was finalized and distributed to the executive team.

December

- CSR Staff arranged for a matching donation to Kitikmeot community Christmas events and activities based on an invitation to do so from the Kitikmeot Inuit Association.
- CSR staff attended an informal meeting with the KIA to discuss IIBA matters as a quorum for an Implementation Committee meeting was not possible. The KIA was briefed on Hope Bay Inuit employment, training and contracting matters. An updated Kitikmeot Qualified Business Registry list was shared by the KIA.
- CSR provided input into drafting a letter to Environment and Climate Change Canada demanding they revise their press release related to their enforcement action at Hope Bay.

6. Performance on Project Certificate Terms and Conditions

6.1 DORIS NORTH PROJECT CERTIFICATE NO. 003

Revised Term and Condition No. 1

Proponent's Commitments:

Revised Term and Condition No. 1	
Category	General
Responsible Parties	The Proponent, Kitikmeot Inuit Association, Nunavut Impact Review Board, Government of Nunavut, Environment and Climate Change Canada, Fisheries and Oceans Canada, Indigenous and Northern Affairs Canada, Health Canada, Natural Resources Canada, and Transport Canada
Project Phase	All Phases
Objective	To capture the commitments that were made by the Proponent at the Final Hearing and any new commitments that have been made in association with project amendments.
Term or Conditions	The commitments in the Final Hearing Report as Appendix A (see Appendix A of Project Certificate): the Proponent Commitments from the Final Environmental Impact Statement Review are incorporated herein and must be met.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	The commitments in the Final Hearing Report as Appendix A includes the addendum to the Final Hearing Report dated June 22, 2006 and the commitments made in the 2015 Amendment application and associated Public Hearing Report dated June 13, 2016.
Status for 2019:	Complete
TMAC Comments:	TMAC's operations are in compliance with this requirement as demonstrated within this report. Appendix E of this report provides an update on all commitments made for this project.
Reference:	NIRB 2019 Report

Revised Term and Condition No. 2

Revised Term and Condition No. 2	
Category:	General
Responsible Parties:	The Proponent, Nunavut Impact Review Board, Kitikmeot Inuit Association, Government of Nunavut, Environment and Climate Change Canada, Fisheries and Oceans Canada, Health Canada, Indigenous and Northern Affairs Canada, and Natural Resources Canada
Project Phase:	All Phases
Objective:	To capture the commitments Miramar presented as Exhibit 37 at the Final Hearing for the Doris North project.
Term or Condition:	The commitments in the Final Hearing Report as Appendix B (see Appendix A of Project Certificate): the Proponent Commitments from the Final Hearing and any project amendments, are incorporated herein and must be met.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC's current operations are in compliance with listed legislation and authorities included in Appendix B of the Project Certificate 003. Refer to Section 2 of this report for a list of all existing TMAC permits and authorizations and Section 7.1 for results of TMAC's regulatory inspections in 2019. Appendix E of this report provides an update on all commitments applicable to the Project.
Reference:	NIRB 2019 Report

Revised Term and Condition No. 3

Revised Term and Condition No. 3	
Category:	Proponent Commitments
Responsible Parties:	The Proponent
Project Phase:	All Phases
Objective:	To ensure all permits are obtained for the Project and any Project amendments.
Term or Condition:	The Proponent must obtain all required federal and territorial permits and other approvals and shall comply with such permits and approvals.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC is in compliance with this requirement to obtain all Federal and Territorial permits and other approvals. Refer to Section 2 of this report for a list of all existing TMAC permits and authorizations.
Reference:	NIRB 2019 Report, Section 2

NIRB's Commitments:

NIRB will require a full time Monitoring Officer to monitor the Project as it proceeds and to analyze the success of the Terms and Conditions as the Project becomes operational, and beyond, to closure and reclamation.

Revised Term and Condition No. 5The Assessment of Alternatives to Tail Lake for Tailings Disposal:

Revised Term and Condition No. 5	
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	The Proponent
Project Phase:	Construction, Operation, and Care and Maintenance
Objective:	To minimize the damage to the environment by minimizing the effects decisions being made today have on the alternatives for tomorrow. Also to facilitate the development of precautionary thresholds to assist with monitoring and detecting potentially significant changes in the region.
Term or Condition:	The Proponent shall report by January 1 of each calendar year to NIRB on its development plan for future phases of the Hope Bay Belt, including identifying development plans that may affect the selection of Tailings Impoundment Area as the preferred alternative for tailings management.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	The location of the Tailings Impoundment Area for the Project has been selected and included in the Metal Mining Effluent Regulations.
Status for 2019:	Complete
TMAC Comments:	<p>TMAC provided updates to the NIRB on annual development plans for 2020 on December 20, 2019. It is noted since that submission that the global COVID-19 pandemic has caused impacts to planned 2020 operations however.</p> <p>No planned 2020 development plans affect the selection of Tailings Impoundment Area as the preferred alternative for tailings management.</p>
Reference:	Correspondence to NIRB submitted December 20, 2019 and NIRB 2019 Annual Report Section 4.

Revised Term and Condition No. 6

Revised Term and Condition No. 6	
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, construction, operations
Objective:	To notify parties of changes due to future developments in the Hope Bay Belt.
Term or Condition:	The Proponent shall immediately notify the NIRB of any further alternatives assessments undertaken for the Tailings Impoundment Area, if that analysis concludes that Tail Lake may no longer be the preferred option for tailings disposal or any modifications to the physical area, tailings volumes, or method of containment.
Reporting Requirements:	To be reported to the NIRB as appropriate and included in the Proponent's annual reporting to the NIRB as required.
Commentary:	Tail Lake has been selected as the Tailings Impoundment Area for the Doris North Project. The NIRB would expect that the Proponent, as soon as reasonable, would notify it of modifications to the Tailings Impoundment Area. Further, due to the phased nature of project development along the Hope Bay Belt, the applicability of this condition may be considered in relation to subsequent development applications.
Status for 2019:	Complete
TMAC Comments:	Tail Lake is currently the preferred option for the Tailings Impoundment Area. This position has not changed in 2019.
Reference:	Revisions to TMAC Resources Inc. Amendment Application No. 1 of Project Certificate No. 003 and Water Licence 2AM-DOH1323, December 2017 Package P5-16 Tailings Management System.

Revised Term and Condition No. 7

Revised Term and Condition No. 7	
Category:	The Assessment of Alternatives to Tail Lake for Tailings Disposal
Responsible Parties:	The Proponent, Environment and Climate Change Canada, and Fisheries and Oceans Canada
Project Phase:	All phases
Objective:	To ensure that tailings is disposed of responsibly and monitored appropriately throughout the life of the Doris North project.
Term or Condition:	The Proponent shall meet immediately with Environment and Climate Change Canada and Fisheries and Oceans Canada to ensure the information required for Schedule 2 of the Metal Mining Effluent Regulations can be processed according to law.
Reporting Requirements:	To be reported to the NIRB as required to provide necessary updates.
Commentary:	Tail Lake was added to Metal Mining Effluent Regulations as a Tailings Impoundment Area under Schedule 2.
Status for 2019:	Complete
TMAC Comments:	TMAC has met with Federal Agencies to ensure that the information required for Schedule 2 of the Metal Mining Effluent Regulations was provided and processed according to law. Schedule 2 of the Metal Mining Effluent Regulations authorizes Tail Lake as the Tailings Impoundment Area.
Reference:	Schedule 2 of the Metal and Diamond Mining Effluent Regulations

Revised Term and Condition No. 8

Tail Lake Water Quality and Water Management Strategy:

Monitoring:

Revised Term and Condition No. 8	
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent and Environment and Climate Change Canada,
Project Phase:	All phases
Objective:	To obtain real time weather data at the Doris North project site.
Term or Condition:	The Proponent will fund and install a weather station at the mine site to collect atmospheric data, including air temperature and precipitation. The design and location of this station shall be developed in consultation with Environment and Climate Change Canada (ECCC) officials.
Reporting Requirements:	To be reported to the Board on an annual basis.
Commentary:	Prior to closure and reclamation, the NIRB expects the Proponent to undertake consultation with appropriate agencies including Environment and Climate Change Canada, to discuss the possibility of the continued operation of the station, including transfer of ownership, for the collection of regional meteorological data. Installation and operation of the real time weather station has occurred.
Status for 2019:	Complete
TMAC Comments:	The Project is in compliance with this requirement to install a weather station at the Doris mine site. The weather station has been operating since TMAC took over the Project in 2013. TMAC also collected atmospheric data from a weather station located at Boston in 2019.
Reference:	Q1-Q3 2019 Atmospheric Compliance Monitoring Program Report - Doris Project (Nunami Stantec 2020)

Revised Term and Condition No. 10

Revised Term and Condition No. 10	
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	Post-closure
Objective:	To ensure water quality and compare these effects to the impact predictions in the 2005 Final Environmental Impact Statement (FEIS) and 2015 Amendment Application.
Term or Condition:	Should water from the Tailings Impoundment Area be discharged into Doris Creek, the Proponent shall ensure that monitoring of Tail Lake and Doris Creek water quality occurs, above and below the waterfall, and is verified by an independent, third party laboratory. The Proponent must provide copies of the results directly to the NIRB and NIRB's Monitoring Officer.
Reporting Requirements:	To be included in the NIRB annual reporting and information collected used to update reports to be submitted to the NIRB.
Status for 2019:	N/A
TMAC Comments:	Tailings Impoundment Area did not discharge to Doris Creek in 2019. All water quality monitoring is conducted in accordance with the requirements of the Nunavut Water Board Type A Water Licence 2AM-DOH1335. A copy of the 2019 NWB Annual Report is filed on the NWB ftp website.
Reference:	2019 NWB Annual Report is publicly available here (ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-DOH1335%20TMAC/3%20TECH/B%20GENERAL/4%20ANNUAL%20RPT/)

Term and Condition No. 11

Term and Condition No. 11	
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	Quality control and quality assurance
Term or Condition:	<p>Monitoring information collected under this approval shall contain the following information:</p> <ul style="list-style-type: none"> • the Person(s) who performed the sampling or took measurements; • date, time, and place of sampling or measurement; • date of analysis; • name of the laboratory who performed the analysis; • analytical methods or techniques used; and • results of any analysis.
Reporting Requirements:	To be stored onsite.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	Monitoring information is collected as required and stored on site and all monitoring information is provided in monthly Surveillance Network Program (SNP) reports filed with the Nunavut Water Board.
Reference:	2019 NWB Annual Report is publicly available here (ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-DOH1335%20TMAC/3%20TECH/B%20GENERAL/4%20ANNUAL%20RPT/)

Revised Term and Condition No. 12

Revised Term and Condition No. 12	
Category:	Tail Lake Water Quality and Water Management Strategy
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	Quality control
Term or Condition:	The results and records of any monitoring, data, or analysis shall be kept for a minimum of the life of the project including closure and post closure monitoring. This time period shall be extended if requested by the Nunavut Impact Review Board, the Nunavut Water Board, Environment and Climate Change Canada, and Fisheries and Oceans Canada.
Reporting Requirements:	To be included in the annual report to the Board.
Commentary:	The NIRB's Monitoring Officer, consulting with Government Officials, will provide guidance on how results and records of any monitoring, data, or analysis will be presented.
Status for 2019:	Complete
TMAC Comments:	Sampling results from water quality monitoring activities are achieved at site for the life of the project and reported to the Nunavut Water Board on a monthly and annual basis.
Reference:	2019 NWB Annual Report is publicly available here (ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-DOH1335%20TMAC/3%20TECH/B%20GENERAL/4%20ANNUAL%20RPT/)

Revised Term and Condition No. 13

Revised Term and Condition No. 13	
Category:	General
Responsible Parties:	The Proponent, Environment and Climate Change Canada, and Indigenous and Northern Affairs Canada
Project Phase:	All phases
Objective:	Collect additional information due to uncertainty in water management
Term or Condition:	<p>The Proponent shall collect additional water quality data for the 2006 field season and incorporate it into a revised water quality model to be submitted to the NWB as part of the water licence application. To ensure the protection of the receiving environment at the point of discharge, the Proponent will meet discharge criteria:</p> <ul style="list-style-type: none"> • Where discharge is to the freshwater environment, on a site specific basis set by the Nunavut Water Board (NWB) where possible and as set by the Metal Mining Effluent Regulations (MMER); and • Where discharge is to Roberts Bay, discharge criteria set by the MMER and the <i>Arctic Waters Pollution Prevention Act</i>.
Reporting Requirements:	Include in water licence application to Nunavut Water Board and included in the Proponent's annual report to the NIRB.
Commentary:	Collection and incorporation of the additional water quality data for the 2006 field season for the water quality model was completed.
Status for 2019:	Complete
TMAC Comments:	The Doris North aquatic study reports for 2006, 2007, and 2008 were submitted by Hope Bay Mining Ltd. As shown in monthly SNP reports discharges have been in compliance with the Nunavut Water Board requirements. No discharges to the receiving environment of mining and milling were made in 2019.
Reference:	<p>Reference 2006, 2007, and 2008 Baseline Report - Hope Bay Mining Limited 2007 Annual Report found on the NWB Website: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-DOH1323%20TMAC/3%20TECH/1%20GENERAL%20(B)/3%20ANNUAL%20RPT/ Doris North Project Aquatic Studies 2006 (Golder 2007a) Doris North Project Aquatic Studies 2007 (Golder 2008) Hope Bay Gold Project 2008 Annual Aquatic Studies Report (Golder 2009)</p>

Revised Term and Condition No. 14

Revised Term and Condition No. 14	
Category:	General
Responsible Parties:	The Proponent and the Nunavut Water Board
Project Phase:	Pre-construction
Objective:	Collect additional information due to uncertainty in water management
Term or Condition:	The Proponent shall collect additional precipitation, evaporation and runoff data and incorporate it into a revised water balance to be submitted to the Nunavut Water Board (NWB) as part of the water licence application.
Reporting Requirements:	No reporting requirement
Commentary:	This obligation was fulfilled and information was included in the application to the Nunavut Water Board.
Status for 2019:	Complete
TMAC Comments:	Requirements were met when Type A Water Licence 2AM-DOH1335 was amended in November 2016 and December 2018.
Reference:	Revisions to TMAC Resources Inc. Amendment Application No. 1 of Project Certificate No. 003 and Water Licence 2AM-DOH1323, December 2016. TMAC Resources Inc. Application for a Type "A" Water Licence 2AM-BOS-and amendment Application for 2AMDOH1323, December 2017.

Revised Term and Condition No. 15

Revised Term and Condition No. 15	
Category:	General
Responsible Parties:	The Proponent and the Nunavut Water Board
Project Phase:	Pre-construction, construction, closure, post closure.
Objective:	To monitor the environmental impacts of the effluent in the Tailings Impoundment Area and Doris Creek and compliance with discharge criteria.
Term or Condition:	The Proponent shall not permit the water discharged into Doris Creek to exceed the criteria set by the NWB.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	This does not preclude the Proponent from meeting requirements of the Metal Mining Effluent Regulations.
Status for 2019:	Complete
TMAC Comments:	No site water was discharged into Doris Creek in 2019.
Reference:	N/A

Revised Term and Condition No. 16

Revised Term and Condition No. 16	
Category:	General
Responsible Parties:	The Proponent, Nunavut Water Board, Nunavut Impact Review Board, Environment and Climate Change Canada, and Indigenous and Northern Affairs Canada
Project Phase:	All Phases
Objective:	To monitor the environmental impacts of the effluent in the Tailings Impoundment Area and Doris Creek and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	The Proponent shall take all reasonable steps to prevent any discharge that is not in compliance with applicable regulatory approvals or requirements. If such a situation is encountered, the Proponent shall take immediate action to address the non-compliant discharge.
Reporting Requirements:	To be reported on an as needed basis and included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC is in compliance with this provision, no discharges from the TIA occurred in 2019. Actions taken to address any non-compliant discharges can be found in Section 7.2 of this report.
Reference:	Section 7.2 of the 2019 NIRB Annual Report.

Revised Term and Condition No. 17

Revised Term and Condition No. 17	
Category:	General
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure timely notification of incidents on site.
Term or Condition:	The Proponent shall report any upset, exceedances, or compliance problem not only to regulatory agencies as required by law, but shall also report the same to the Nunavut Impact Review Board's Monitoring Officer.
Reporting Requirements:	To be reported on an as needed basis and included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC reports any upset, exceedances, or compliance problems to the respective regulatory agencies and to the Nunavut Impact Review Boards' Monitoring Officer as required.
Reference:	N/A

Revised Term and Condition No. 18

Revised Term and Condition No. 18	
Category:	General
Responsible Parties:	The Proponent, Nunavut Impact Review Board, and Nunavut Water Board
Project Phase:	All phases
Objective:	To assess and mitigate impacts of acid rock generation and metal leaching.
Term or Condition:	The Proponent shall submit to the Nunavut Water Board (NWB), as part of the water licence application, a program detailing the methodology for testing quarried rock for acid generation and metal leaching potential. The sampling, testing, and analysis must be done by a professional geologist registered in Nunavut.
Reporting Requirements:	To be reported to the NIRB as required.
Commentary:	The Nunavut Impact Review Board (NIRB) expects any methodology to be certified by a Registered Professional and approved by the Nunavut Water Board. The NIRB expects that any analysis of laboratory results must also be done by a Registered Professional. The designation of Registered Professional refers to all those professionals registered with the Northwest Territories and Nunavut Association of Professional Engineers, Geologists, and Geophysicists (NAPEGG). This obligation is complete but should continue to be updated as required.
Status for 2019:	Complete
TMAC Comments:	TMAC provides the methodology for testing quarried rock for acid generation and metal leaching potential to the NWB through relevant management plans. The Hope Bay Project Quarry Rock Management Plan (December 2017) details the currently approved methodology for testing quarried rock.
Reference:	Hope Bay Project Quarry Management (TMAC 2017) Results of this monitoring are found in 2019 Waste Rock, Quarry and Tailings Monitoring Report, Doris Mine and Madrid North Mines, Hope Bay Project (Appendix C-5)

Revised Term and Condition No. 19

Design of the Jetty and Related Issues:

Revised Term and Condition No. 19	
Category:	Design of the Jetty and Related Issues
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To monitor the impacts of the jetty on shallow water permafrost and compare to predations in 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	The Proponent shall install thermistor cables and temperature loggers in the jetty foundation as well as the new jetty foundation. The Proponent shall monitor the effects of the jetty on shallow water permafrost through operations, until such time as the Nunavut Impact Review Board (NIRB) determines that such monitoring is no longer necessary, and report the results of the monitoring collection to NIRB's Monitoring Officer.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	The new jetty is defined as the marine outfall berm.
Status for 2019:	Complete
TMAC Comments:	<p>TMAC is in compliance with this requirement to install thermistor cables and temperature loggers in the jetty foundation. Thermistor cables and temperature loggers were installed in March 2009 and the monitoring results have been provided to the Monitoring Officer and the foundations are stable. Jetty thermistor data is reported as part of the Doris annual geotechnical inspection in accordance with Part I, section 9 of the current Type A Water Licence.</p> <p>It is noted by TMAC that the commentary provided by the NIRB indicating the new jetty refers the marine outfall berm is inaccurate and should instead apply to the upgraded jetty that was proposed at the time of application but was not constructed.</p>
Reference	Doris Annual Geotechnical Inspection Report (SRK 2020)

Revised Term and Condition No. 20

Revised Term and Condition No. 20	
Category:	Design of the Jetty and Related Issues, Accidents and Malfunctions
Responsible Parties:	The Proponent and Transport Canada
Project Phase:	All Phases
Objective:	To prevent or limit potential for ecosystemic effects in the event of fuel or waste spills.
Term or Condition:	The Proponent shall ensure spill kits are at hand at the Roberts Bay oil handling facility at all times, and that appropriate containment measures are used in the event of a spill in accordance with the most recent version of the Oil Pollution Emergency Plan and Oil Pollution Prevention Plan reviewed by Transport Canada.
Reporting Requirements:	N/A
Commentary:	The NIRB notes that term and condition 20 and term and condition 33 are expected to work together as one refers to the Roberts Bay jetty and one the transfer and handling of fuel on site.
Status for 2019:	Complete
TMAC Comments:	<p>The project is in compliance with this requirement to ensure that areas used for fuel storage and hazardous materials are contained using the safest methods practical. Location of spill kits can be found in the updated Hope Bay Project Spill Contingency Plan (March 2020).</p> <p>Fuel storage areas on the Project site are constructed in compliance with required engineering standards, and the fuel tanks at Doris are registered with CIRNAC (formerly Indigenous and Northern Affairs Canada). These facilities are also in compliance with the Type A Water Licence for Doris 2AM-DOH1335. TMAC has a Transport Canada approved Oil Pollution Preparedness/Oil Pollution Emergency Plan (OPPP/OPEP) TMAC Resource Inc. August 2019.</p>
Reference	Hope Bay Project Spill Contingency Plan (TMAC 2020b) and Oil Pollution Preparedness/Oil Pollution Emergency Plan (OPPP/OPEP; TMAC 2019c)

Revised Term and Condition No. 21

Revised Term and Condition No. 21	
Category:	Design of the Jetty and Related Issues
Responsible Parties:	The Proponent, Kitikmeot Inuit Association, and Nunavut Tunngavik Incorporated
Project Phase:	Closure and post closure
Objective:	To ensure a smooth transfer of ownership should the jetty remain for use of the public post closure of the Project.
Term or Condition:	The Proponent shall consult with Elders, the Kitikmeot Inuit Association and Nunavut Tunngavik Incorporated to determine <i>if</i> the jetty should be dismantled. The final Closure and Reclamation Plan, if it proceeds, must explain the consultation process used for the jetty and provide a summary of the issues used for the jetty and provide a summary of the issues identified during consultation.
Reporting Requirements:	To be reported by the Proponent prior to closure commencing.
Commentary:	NIRB has already considered these components and as quoted by the Minister in his letter to NIRB dated July 28, 2006 "...further review under Article 12 would only be required if substantive changes were proposed that would significantly modify the project." Also, the Proponent is expected to submit the summary of issues identified during consultation to NIRB's Monitoring Officer.
Status for 2019:	N/A
TMAC Comments:	The Roberts Bay jetty remains in use and TMAC does not have any plans to dismantle the existing jetty. Prior to final closure and reclamation of the jetty TMAC will consult with local Elders, KIA, and NTI on the closure plan for the Roberts Bay jetty.
Reference:	N/A

Revised Term and Condition No. 22Wildlife Mitigation and Monitoring Plan

Revised Term and Condition No. 22	
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent, Government of Nunavut-Department of Environment, and Kitikmeot Inuit Association
Project Phase:	Pre-construction, construction
Objective:	To collect baseline information on wolverine and grizzly bear populations in the area in order to assess impacts of the Project.
Term or Condition:	The Proponent, in consultation with Government of Nunavut- Department of Environment and Kitikmeot Inuit Association, shall immediately begin the design and implementation of baseline data collection methods to establish both the wolverine and grizzly bear population of the Hope Bay Belt region. Any baseline data results shall be reported to NIRB's Monitoring Officer.
Reporting Requirements:	To be included in the Proponent's annual wildlife report to the NIRB.
Commentary:	The Proponent has collected the baseline data and continues to collect ongoing monitoring data and the results are incorporated as appropriate into the Proponent's Wildlife Mitigation and Management Plan.
Status for 2019:	Complete
TMAC Comments:	Monitoring data is collected on wolverine and grizzly bear through the wildlife camera project and wildlife interactions documented by Project personnel. The results of observations from these programs are included in the 2019 Wildlife Mitigation and Monitoring Plan Compliance Report.
Reference:	See Sections 3.6 Grizzly Bear and 3.7 Wolverine for monitoring results in the 2019 Wildlife Mitigation and Monitoring Program Compliance Report (ERM 2020a), Appendix C-3.

Revised Term and Condition No. 23

Revised Term and Condition No. 23	
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the impacts of the Project on wildlife and compare these effects to the impact predictions in the 2005 Doris North Final Environmental Impact Statement and the 2015 Amendment Application.
Term or Condition:	The Proponent shall designate one of its employees as a primary wildlife contact for the mine, who will work with the Nunavut Impact Review Board's Monitoring Officer and regulatory officials in communicating on-site activities and to fulfill reporting requirements.
Reporting Requirements:	To be included in the Proponent's annual report and annual wildlife report to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	Reports of wildlife interactions, incidents and mortalities are reported to NIRB by the environmental coordinator and included as results and appendix in the annual Wildlife Mitigation and Monitoring Program Compliance report.
Reference:	See Section 3.2.2 Wildlife Interactions, Incidents and Mortalities in the 2019 Wildlife Mitigation and Monitoring Program Compliance Report (ERM 2020a), Appendix C-3.

Revised Term and Condition No. 24

Revised Term and Condition No. 24	
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure staff are prepared and are following commitments made for the Project.
Term or Condition:	As part of the training for the Proponent's on-site wildlife specialist, the Proponent shall provide training to that person in areas of bear encounters and safety, effects of noise on wildlife, recording wildlife sightings, waste management, records management, and reporting to the Nunavut Impact Review Board's Monitoring Officer and regulatory officials.
Reporting Requirements:	To be included in the Proponent's annual report and annual wildlife report to the NIRB as required.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC provides site orientation to all employees and contractors and regular reminders during staff meetings to contribute wildlife observations and interaction reporting. There is a strict protocol for reporting bear sightings with consequences if they are not followed. Quarterly reports of wildlife interactions, incidents and mortalities are reported to NIRB by the Environmental Superintendent and included as results and appendix in the annual wildlife report.
Reference:	See Section 3.2.2 Wildlife Interactions, Incidents and Mortalities in the 2019 Wildlife Mitigation and Monitoring Program Compliance Report (ERM 2020a), Appendix C-3.

Revised Term and Condition No. 25

Revised Term and Condition No. 25	
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the impacts of the Project on the wildlife and compare these effects to the impact predicted in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	The Proponent shall file a monitoring plan focused on assessing and mitigating interaction between wildlife and humans at the mine site, including associated infrastructure such as the TIA (Tailings Impoundment Area), roads, and activity at the waterfall and Roberts Bay. An annual report must be sent by March 30 each year to NIRB's Monitoring Officer on interactions that have occurred, any effect the interaction might have had on humans and wildlife, and mitigation measures taken to avoid similar interactions in the future. The Proponent shall file a report to NIRB within 48 hours should any incident occur which results in wildlife mortality.
Reporting Requirements:	To be included in the Proponent's annual wildlife report and annual report as appropriate to the NIRB.
Commentary:	The NIRB would expect that the reporting be coordinated with the legislated requirement for TMAC Resources Inc. to report mortalities of grizzly bear, Polar Bear, muskox, caribou, wolf, and Wolverine to the local conservation officer in Cambridge Bay.
Status for 2019:	Complete
TMAC Comments:	TMAC submitted to NIRB an updated Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a) in December 2019. The 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a), Appendix C-3, was submitted to NIRB's monitoring officer April 1, 2020. The Environmental Superintendent reports any cases of wildlife mortality to NIRB.
Reference:	See Section 3.2.2 Wildlife Interactions, Incidents and Mortalities in the 2019 Wildlife Mitigation and Monitoring Program Compliance Report (ERM 2020a), Appendix C-3.

Revised Term and Condition No. 26

Revised Term and Condition No. 26	
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To alleviate concerns related to wildlife on the Project site.
Term or Condition:	The Proponent shall consult with local Elders, Kitikmeot Hunters and Trappers Organizations, the Nunavut Wildlife Management Board, Government of Nunavut-Department of Environment, Environment and Climate Change Canada, and the Nunavut Impact Review Board's Monitoring Officer to review and discuss the results of wildlife monitoring and develop mitigation measures, including measures to discourage wildlife and birds from coming into contact with the Tailings Impoundment Area and contaminated areas of the mill site. The Proponent shall incorporate a plan for this consultation into a reviewed Wildlife Monitoring and Mitigation Plan.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	In progress
TMAC Comments:	<p>TMAC updated the Wildlife Mitigation and Monitoring Plan (WMMP) in December 2019 and this plan is circulated to Inuit organizations, stakeholders and government agencies as part of the annual NIRB report for comment.</p> <p>TMAC reports the results of ongoing wildlife monitoring plans in the Wildlife Mitigation and Monitoring Plan Report (WMMP Report), included in the annual NIRB report and circulated to the same groups and agencies for comment.</p> <p>In addition to providing the WMMP and WMMP Report for review of planned wildlife mitigation and monitoring and monitoring results TMAC conducts focused consultation on wildlife through a variety of avenues.</p> <p>TMAC established an Inuit Environmental Advisory Group (IEAC), where wildlife mitigation and the results of monitoring are discussed with Inuit elders familiar with the Project area. TMAC chaired two IEAC meetings in the spring and fall of 2019. The objectives of the meeting were to update the group on Project activities but more specifically to gain perspectives on TMAC's future No Net Loss Plan and caribou monitoring for the Madrid-Boston Project.</p> <p>TMAC also held focused workshops with local Elders and landusers in 2016 and 2017 which included site visits and review of current and proposed mitigation. A meeting was held in the fall of 2018 to review updates to the analyses of long-term bird datasets with relevant stakeholders.</p>
Reference:	2019 Wildlife Mitigation and Monitoring Program Compliance Report (Appendix C-3)

Revised Term and Condition No. 27

Revised Term and Condition No. 27	
Category:	Wildlife Mitigation and Monitoring Plan including Cumulative Effects Assessment
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To assess the environmental impact of the Project on wildlife and compare these effects to the impact predicted in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	The Proponent shall update and revise the Wildlife Mitigation and Monitoring Plan (WMMP) to reflect Project terms and conditions and shall revise the Wildlife Mitigation and Monitoring Plan and submit to the Nunavut Impact Review Board (NIRB) for review. The NIRB may consult with relevant Government departments and the Nunavut Wildlife Management Board prior to approving the revised WMMP. The revised WMMP must be submitted within three (3) months after the updated Project Certificate is issued. The Proponent must also submit an updated plan on an annual basis which must also be approved by NIRB.
Reporting Requirements:	The Proponent is to report to the NIRB in its annual report.
Commentary:	Monitoring measures included in the Wildlife Mitigation and Monitoring Plan should be appropriate to confirm impact predictions, monitoring impacts, and to support adaptive implementation of mitigation measures. Specific to caribou, during construction and operations the Proponent must annually review relevant available data from on site and caribou collar data and shall consider revisions to the Wildlife Mitigation and Monitoring Plan.
Status for 2019:	Complete
TMAC Comments:	TMAC submitted to NIRB an updated Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a) in December 2019. The 2019 Wildlife Mitigation and Monitoring Program Compliance Report (ERM 2020a), Appendix C-3, was submitted to NIRB's monitoring officer April 1, 2020.
Reference:	Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a)

Revised Term and Condition No. 28

The Socio-Economic Impact of the Project on Affected Communities of Nunavut:

Revised Term and Condition No. 28	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, the Government of Nunavut, and Indigenous and Northern Affairs Canada
Project Phase:	All Phases
Objective:	To assess the socio-economic impact of the Project on affected communities of Nunavut and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	<p>The Hope Bay Belt Socio-Economic Monitoring Committee is continued and renamed as the Hope Bay Socio-Economic Working Group. The invited members of the Hope Bay Socio-Economic Working Group shall include the Proponent, the Government of Nunavut, Indigenous and Northern Affairs Canada, and the Kitikmeot Inuit Association and any other invitees the members of the Working Group may, from time to time invite to participate.</p> <p>The central focus of the Hope Bay Socio-Economic Working Group shall be on collaborating to ensure that the Hope Bay Socio-Economic Monitoring Plan provides for appropriate Project-specific socio-economic effects monitoring as required throughout the life of the Project. The Hope Bay Socio-Economic Monitoring Plan shall apply to the Project as described in both the 2005 FEIS and the 2015 Amendment Application.</p> <p>The Proponent, reflecting the input of the Hope Bay Socio- Economic Working Group shall produce an annual Hope Bay Socio-Economic Monitoring Plan report.</p>
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	The NIRB strongly suggests the use of a standardized reporting template to ensure consistent data collection and tracking of data trends in a comparable form to be shared upon request at the regional level and to minimize the duplication of efforts.
Status for 2019:	An updated Hope Bay Socio-Economic Monitoring Plan, incorporating changes required as a result of NIRB Project Certificate 009, was submitted to the Hope Bay Socio-Economic Working Group (HBSEWG) and the NIRB in February 2020. This Plan incorporates all comments received from the HBSEWG in 2019 and a requested indicator summary table. Report pending. An updated Socio-Economic Monitoring Program (SEMP) report is planned to be submitted for review to the HBSEWG in May of 2020. Finalizing the report will take place once comments from regulators are received.
TMAC Comments:	The Hope Bay Belt Socio-Economic Monitoring Committee continues to operate, now as the Hope Bay Socio-Economic Working Group. The 2019 Hope Bay SEMP report is being drafted and is planned to be submitted for review to the Hope Bay Socio-Economic Monitoring Working Group and the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC) in May of 2020, as is the practice for annual SEMP reporting. Finalizing the report will take place once comments from regulators are received.
Reference:	Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020), will be submitted to the NIRB once finalized.

Revised Term and Condition No. 29

Noise:

Revised Term and Condition No. 29	
Category:	Noise
Responsible Parties:	The Proponent, Government of Nunavut-Department of Environment, Environment and Climate Change Canada, Health Canada, Fisheries and Oceans Canada, and Workers Compensation Board
Project Phase:	All phases
Objective:	To assess noise impacts of the Project on wildlife and humans and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	The Proponent shall develop and implement a noise abatement plan to protect people and wildlife from mine activity noise, including blasting, drilling, equipment, vehicles and aircraft. The noise abatement plan will be developed in consultation with the Government of Nunavut- Department of Environment, Environment and Climate Change Canada, and Health Canada, and should be updated on an as required basis.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	The Local Study Area refers to the combined spatial boundaries set by the Proponent in its Final Environmental Impact Statement for each sensitive Valued Ecosystemic Component including arctic char, lake trout, lake whitefish, ninespine stickleback, Caribou, grizzly bear, Wolverine, upland breeding birds, waterfowl, and raptors. Also the noise abatement plan will consider potential blasting time restrictions with Fisheries and Oceans Canada's (DFO) Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky 1998) as modified by DFO for use in the North. The Proponent should also consult with Health Canada, the Government of Nunavut-Department of Environment, and the Workers Compensation Board in locating and designing the sound meters.
Status for 2019:	Complete
TMAC Comments:	TMAC does not maintain a standalone Noise Abatement Plan. For the protection of people, TMAC implements noise monitoring and abatement under its occupational health and safety management program which is reviewed by the WSCC Mines Inspector. For the protection of wildlife, TMAC implements its noise management under its wildlife mitigation and monitoring program. TMAC submitted to NIRB an updated Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a) in December 2019. The 2019 Wildlife Mitigation and Monitoring Program Compliance Report (ERM 2020a), Appendix C-3, was submitted to NIRB's monitoring officer April 1, 2020.
Reference:	Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a) Hope Bay Health and Safety Management Plan (TMAC 2017)

Revised Term and Condition No. 30

Air Quality:

Revised Term and Condition No. 30	
Category:	Air Quality
Responsible Parties:	The Proponent, Environment and Climate Change Canada
Project Phase:	All Phases
Objective:	To assess air quality impact of the Project in the project area and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	The Proponent will install and fund an atmospheric monitoring station. This station and its location shall be developed in consultation with Environment and Climate Change Canada and Health Canada air quality officials and focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported every six (6) months to the Nunavut Impact Review Board through the Monitoring Officer, and from there to all of the parties.
Reporting Requirements:	Reported every six (6) months.
Commentary:	Installation of the atmospheric monitoring station was completed.
Status for 2019:	Complete
TMAC Comments:	TMAC operates and funds an atmospheric monitoring station. TMAC submitted two semi-annual air quality reports in 2019 and is providing the updated report with this submission.
Reference:	Q1-Q3 2019 Atmospheric Compliance Monitoring Program Report (Nunami Stantec 2020), Appendix C-1 of the 2019 NIRB Annual Report

Revised Term and Condition No. 31

Closure and Reclamation:

Revised Term and Condition No. 31	
Category:	Closure and Reclamation
Responsible Parties:	The Proponent
Project Phase:	Operations, Care and Maintenance
Objective:	To ensure a plan was in place due to the short lifespan of the Project.
Term or Condition:	The Proponent shall maintain a complete Closure and Reclamation Plan on file with the Nunavut Water Board prepared in accordance with requirements of the Nunavut Water Board and other regulators.
Reporting Requirements:	The NIRB would require this prior to the closure as the mine is subject to NIRB Review.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	The project is in compliance with this requirement to prepare a complete Closure and Reclamation Plan. An updated November 2017 Interim Closure and Reclamation Plan for the Doris-Madrid portions of the Project and a November 2017 Conceptual Closure and Reclamation Plan for the Boston portion of the Project were submitted to the NWB and approved with licence issuance in early 2019.
Reference:	Hope Bay Project Boston Conceptual Closure and Reclamation Plan (SRK 2017a) Hope Bay Project Doris-Madrid Interim Closure and Reclamation Plan (SRK 2017b)

Revised Term and Condition No. 32Environment, Health and Safety Management System:

Revised Term and Condition No. 32	
Category:	Environment, Health and Safety Management System
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure all plans are approved and in place prior to commencement of construction.
Term or Condition:	Prior to the commencement of operation the Proponent shall have a complete Environment, Health and Safety Management System in place which includes the following: Wildlife Mitigation and Monitoring Plan; Environmental Protection Plan; Emergency Response and Spill Contingency Plan; Occupational Health and Safety Plan; Human Resources Plan; Community Relations Plan; Monitoring and Follow-up Plan; and Auditing and Continuous Improvement Plan. When complete, these Plans shall be forwarded to the Nunavut Impact Review Board's Monitoring Officer.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB as required.
Commentary:	<p>The Proponent is expected to contact federal and territorial Government Departments immediately regarding the preparation of these plans. The Government of Nunavut, in particular, is involved with the approval of many of the plans and is encouraged to designate an official to approve the plans as applicable. Please see Appendix E for a list of Government of Nunavut contacts.</p> <p>NIRB considers the Environmental, Health and Safety Management System to be complete once MHL has submitted all required plans. NIRB expects the Environmental Health and Safety Management System to be completed prior to the commencement of construction.</p>
Status for 2019:	In progress
TMAC Comments:	TMAC has been submitting the plans that make-up the Environment, Health and Safety Management System to the Monitoring Officer as they are revised or completed. The existing and implemented Hope Bay Project Management Plans are shown in Section 10 of this report and updated plans are provided to the NIRB via stand-alone submissions when required. For use in 2020, a Shipping Management Plan (TMAC, August 2019) is being provided.
Reference:	2019 NIRB Report, Section 10.

Revised Term and Condition No. 33

Fuel and Hazardous Materials:

Revised Term and Condition No. 33	
Category:	Fuel and Hazardous Materials
Responsible Parties:	The Proponent
Project Phase:	All phases
Objective:	To ensure best practices are being utilized on site.
Term or Condition:	The Proponent shall ensure spill kits are at hand at the Roberts Bay oil handling facility at all times, and that appropriate containment measures are used to prevent, contain and respond to a spill in accordance with the Most recent version of the Oil Pollution Emergency Plan and Oil Pollution Prevention Plan reviewed by Transport Canada.
Reporting Requirements:	N/A
Commentary:	The NIRB expects that Term and Condition 33 would work together with Term and Condition 20.
Status for 2019:	Complete
TMAC Comments:	<p>The project is in compliance with this requirement to ensure that areas used for fuel storage and hazardous materials are contained using the safest methods practical. Location of spill kits can be found in the updated Hope Bay Project Spill Contingency Plan (March 2020).</p> <p>Fuel storage areas on the Project site are constructed in compliance with required engineering standards, and the fuel tanks at Doris are registered with CIRNAC (formerly Indigenous and Northern Affairs Canada). These facilities are also in compliance with the Type A Water Licence for Doris 2AM-DOH1335. TMAC has a Transport Canada approved Oil Pollution Preparedness/Oil Pollution Emergency Plan (OPPP/OPEP) TMAC Resource Inc. August 2019.</p>
Reference:	Hope Bay Project Spill Contingency Plan (TMAC 2020b) and Oil Pollution Preparedness/Oil Pollution Emergency Plan (OPPP/OPEP) (TMAC 2019c)

Revised Term and Condition No. 34

Planned Changes:

Revised Term and Condition No. 34	
Category:	Planned Changes
Responsible Parties:	The Proponent
Project Phase:	Pre-construction, construction, operations, care and maintenance
Objective:	To ensure all future developments are reported on a timely bases due to the short mine life.
Term or Condition:	The Proponent shall give notice of any planned significant changes to the mine facility, including the Tailings Impoundment Area, mining infrastructure such as the mill, to the regulatory authorities and the Nunavut Impact Review Board (NIRB) through its Monitoring Officer, in a timely basis.
Reporting Requirements:	To be reported by the Proponent to the NIRB as required.
Commentary:	“Planned Changes” refers to changes that may cause an environmental effect. Significant means any change to the mine facilities, which would require a reconsideration of the project certificate or an amendment of the Type “A” Water Licence. Please see related Terms and Conditions #17, #5, and #6.
Status for 2019:	Complete
TMAC Comments:	The project will continue to notify NIRB of planned changes to the mine facility, including the TIA, and its operations. It is understood that changes should be reported based on their anticipated social and environmental impacts to the Hope Bay Project. Given the pandemic it is likely that reductions to planned activities will be realized in 2020.
Reference:	N/A

Revised Term and Condition No. 35Duty to Comply:

Revised Term and Condition No. 35	
Category:	Duty to Comply
Responsible Parties:	The Proponent
Project Phase:	All Phases
Objective:	N/A
Term or Condition:	The Proponent shall comply with all terms and conditions and any noncompliance constitutes a violation of the approval and is grounds for NIRB's reconsideration and recommendation to the Minister under Article 12, Part 8 of the NLCA.
Reporting Requirements:	N/A
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	The Project will remain in compliance with this requirement as described herein.
Reference:	N/A

New Term and Condition No. 36

New Term and Condition No. 36	
Category:	Freshwater
Responsible Parties:	The Proponent and the Nunavut Water Board
Project Phase:	Pre-construction, construction, and operations
Objective:	To assess the environmental impact of the Project on Doris Lake and fish and fish habitat.
Term or Condition:	The Proponent shall continue year-round monitoring and recording of Doris Lake water levels during construction and operations. This will allow for detection of actual Doris Lake draw down below the sill level; computation of the amount of drawdown, quantification of the project impact, and implementation of adaptive mitigation and management measures as appropriate.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	The project monitors and records Doris Lake Water Levels. Results of year-round monitoring and recording are provided in the Nunavut Water Board Annual Report submitted to the NWB and is available on the NWB ftp site. Additionally, TMAC has provided the 2019 Aquatic Effects Monitoring Program Report as Appendix C-4 to this report that addresses lake levels.
Reference:	2019 Aquatic Effects Monitoring Program Report (ERM 2020) Appendix C-4 of the 2019 NIRB Annual Report

New Term and Condition No. 37

New Term and Condition No. 37	
Category:	Freshwater
Responsible Parties:	The Proponent, The Nunavut Water Board, and Indigenous and Northern Affairs Canada
Project Phase:	Pre-construction, construction, operations, care and maintenance
Objective:	To assess the environmental impact of the Project on groundwater due to mining in a talik.
Term or Condition:	The Proponent shall develop and submit a detailed Groundwater Management Plan for review during the water licensing process and to the Nunavut Impact Review Board as part of the plans available on the Doris North project. The plan shall acknowledge uncertainties pertaining to predictions of groundwater quantity and quality and inform the Groundwater Management Plan. Indigenous and Northern Affairs Canada should be consulted with respect to the contents of the Plan and any required mitigation measures.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC implements the Hope Bay Project Ground Water Management Plan (TMAC 2020). It was recently updated and submitted in coordination with the 2019 Nunavut Water Board Annual Report.
Reference:	Hope Bay Project Ground Water Management Plan (TMAC 2020)

New Term and Condition No. 38

New Term and Condition No. 38	
Category:	Marine Environment
Responsible Parties:	The Proponent and Indigenous and Northern Affairs Canada
Project Phase:	Operations, care and maintenance, and closure
Objective:	To assess the environmental impact of the Project on the seabed and marine environment if the effluent discharge pipeline is abandoned in place or removed.
Term or Condition:	At least six (6) months prior to construction of the effluent pipeline and diffuser system the Proponent shall provide the NIRB with a detailed design for the system that includes the location of the pipeline in relation to the existing roadway, the location of the small jetty supporting the pipeline and the design of the diffuser.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB in the year which it is developed.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC submitted a detailed design of the pipeline and marine outfall system to the NIRB on August 29, 2018.
Reference:	TMAC correspondence to the NIRB Re: Marine Outfall Berm, Detailed Design Drawings and Hazard and Operability Study submitted on August 29, 2018.

New Term and Condition No. 39

New Term and Condition No. 39	
Category:	Marine Environment
Responsible Parties:	The Proponent and Indigenous and Northern Affairs Canada
Project Phase:	Operations, care and maintenance, and closure
Objective:	To assess the environmental impact of the Project on the seabed and marine environment if the effluent discharge pipeline is abandoned in place or removed.
Term or Condition:	At least six (6) months prior to operation of the effluent pipeline and diffuser system, the Proponent shall conduct and submit to the Board a hazard and operability study of the pipeline and marine outfall system as part of the land authorization process.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB in the year it is to be developed.
Commentary:	The jetty is also defined as the marine outfall berm.
Status for 2019:	Complete
TMAC Comments:	TMAC submitted a hazard and operability study of the pipeline and marine outfall system to the NIRB on August 29, 2018.
Reference:	TMAC correspondence to the NIRB Re: Marine Outfall Berm, Detailed Design Drawings and Hazard and Operability Study submitted on August 29, 2018.

New Term and Condition No. 40

New Term and Condition No. 40	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent and Hope Bay Socio-Economic Working Group
Project Phase:	All phases
Objective:	To monitor the socio-economic effects of the Project on affected communities of Nunavut and compare these effects to the impact predictions in the 2005 FEIS and the 2015 Amendment Application.
Term or Condition:	An updated Hope Bay Project Socio-Economic Monitoring Program Update was finalized in December of 2019. The Hope Bay Project: 2019 Socio-Economic Monitoring Program report is completed according to program update.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	The updated program reflects Phase 2 FEIS Final Hearing Report considerations. The HBSEWG has approved the updated program and this document filed with the NIRB in February 2020. This updated Program is now the basis for Socio-Economic Monitoring for the Hope Bay Belt including Phase II.
Reference:	Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2019)

New Term and Condition No. 41

New Term and Condition No. 41	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group, Kitikmeot Socio-Economic Monitoring Committee (K-SEMC)
Project Phase:	End of Operations, Temporary or Final Closure
Objective:	To prepare for, monitor and mitigate the potential socio-economic effects of temporary or permanent mine closure on the affected communities of Nunavut.
Term or Condition:	Two (2) years prior to the planned Final Closure of the Project, the Proponent shall, in collaboration with the Hope Bay Socio-Economic Working Group submit an updated Doris North Socio-Economic Monitoring Plan to the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC) that will also include detail regarding specific measures that may mitigate the potential for negative effects as a result of Project closure.
Reporting Requirements:	Required updated Doris North Socio-Economic Monitoring Plan to be submitted to the NIRB at the same time as the K-SEMC.
Commentary:	N/A
Status for 2019:	Not applicable
TMAC Comments:	Two years prior to planned Final Closure TMAC will, in collaboration with the Hope Bay Socio-Economic Working Group, submit an updated Hope Bay Socio-Economic Monitoring Plan to the Kitikmeot Socio-Economic Monitoring Committee.
Reference:	N/A

New Term and Condition No. 42

New Term and Condition No. 42	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group, Kitikmeot Socio-Economic Monitoring Committee (K-SEMC)
Project Phase:	End of Operations, Temporary or Final Closure
Objective:	To mitigate the potential socio-economic effects of temporary or permanent mine closure on the affected communities of Nunavut
Term or Condition:	Within six (6) months following an unanticipated temporary or final closure of the Project the Proponent shall, in collaboration with the Hope Bay Socio-Economic Working Group submit an updated Doris North Socio-Economic Monitoring Plan to the K-SEMC that will also include detail regarding specific measures that may mitigate the potential for negative effects as a result of the Project's temporary or permanent closure.
Reporting Requirements:	Required updated Doris North Socio-Economic Monitoring Plan to be submitted to the NIRB at the same time as the K-SEMC.
Commentary:	N/A
Status for 2019:	Not applicable
TMAC Comments:	Six (6) months following an unanticipated temporary or final closure of the Project TMAC will, in collaboration with the Hope Bay Socio-Economic Working Group, submit an updated Hope Bay Socio-Economic Monitoring Plan to the Kitikmeot Socio-Economic Monitoring Committee.
Reference:	N/A

New Term and Condition No. 43

New Term and Condition No. 43	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group, and the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC)
Project Phase:	End of Operations, Temporary or Final Closure
Objective:	To mitigate the potential socio-economic effects of temporary or permanent mine closure on the affected communities of Nunavut.
Term or Condition:	Two (2) years prior to the planned Final Closure of the Project, the Proponent shall submit to the NIRB an updated Human Resource Plan and Wellness Strategy for the Project that includes a Workforce Transition Strategy designed to mitigate the potential negative effects of Project closure on the affected communities of Nunavut.
Reporting Requirements:	Updated Human Resource Plan and Wellness Strategy submitted to the NIRB in accordance with the timelines prescribed.
Commentary:	For greater clarity, under this term and condition the update to the Human Resources Plan and Wellness Strategy for the Project (including a Workforce Transition Strategy) is required to be filed at least two (2) years prior to the Proponent's planned Final Closure of the Project, regardless of whether the Project has, at that time, already ceased operations, is being maintained in a temporarily closed phase or has already entered the final closure phase.
Status for 2019:	Not applicable
TMAC Comments:	Two years prior to planned Final Closure of the Project, TMAC will submit to the NIRB and updated Human Resources Plan and Wellness Strategy, including a Workforce Transition Strategy, for the Project.
Reference:	N/A

New Term and Condition No. 44

New Term and Condition No. 44	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Government of Nunavut, and the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC)
Project Phase:	All Phases
Objective:	To support co-ordination and collaboration of education and training initiatives with Government of Nunavut Initiatives.
Term or Condition:	Within six (6) months following an unanticipated temporary or final closure of the Project the Proponent shall submit to the NIRB an updated Human Resource Plan and Wellness Strategy for the Project that includes a Workforce Transition Strategy designed to mitigate the potential negative effects of Project closure on the affected communities of Nunavut.
Reporting Requirements:	Updated Human Resource Plan and Wellness Strategy submitted to the NIRB in accordance with the timelines prescribed.
Commentary:	N/A
Status for 2019:	Not applicable
TMAC Comments:	Six (6) months following an unanticipated temporary or final closure TMAC will submit to the NIRB and updated Human Resources Plan and Wellness Strategy for the Project.
Reference:	N/A

New Term and Condition No. 45

New Term and Condition No. 45	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent and the Government of Nunavut
Project Phase:	All Phases
Objective:	To support co-ordination and collaboration of education and training initiatives with Government of Nunavut Initiatives.
Term or Condition:	To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall share information with the Government of Nunavut, Department of Education with respect to the Proponent's youth employment initiatives in their Human Resources Plan, and other programs that may relate to education and will, to the extent possible integrate the Proponent's activities into the existing Department of Education program, and communication and delivery plans.
Reporting Requirements:	Collaboration and integration initiatives to be included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Ongoing
TMAC Comments:	TMAC continues to coordinate and collaborate with the Government of Nunavut Department of Education, Department of Family Services and Nunavut Arctic College on education and training matters. This includes continued participation in the Nunavut Mine Training Roundtable, the KIA Employment and Training Stakeholder Working Group, and through specific scheduled meetings with officials. Also in 2019, TMAC worked with the Kitikmeot Inuit Association to negotiate a draft Memorandum of Understanding (MOU) with the Government of Nunavut that would further formalize coordination and collaboration efforts. This final draft MOU is in the hands of the Department of Economic Development and Transportation, the key lead Government of Nunavut Department. It is anticipated that the MOU will be signed and agreed to in 2020.
Reference:	N/A

New Term and Condition No. 46

New Term and Condition No. 46	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent and the Government of Nunavut
Project Phase:	All Phases
Objective:	To support co-ordination and collaboration of education and training initiatives with Government of Nunavut Initiatives
Term or Condition:	<p>To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall provide the Government of Nunavut (GN) and the NIRB information regarding the labour force needs of the Project as it proceeds:</p> <ul style="list-style-type: none"> • the title and number of positions required by department or work area; • the potential start dates; • to the level of education required (with reference to the specific positions); and • whether on-the-job or other forms of training and certification will be required (with reference to the specific positions).
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB or when the Proponent anticipates significant changes in labour force needs for the Project.
Commentary:	N/A
Status for 2019:	Ongoing
TMAC Comments:	<p>TMAC continues in 2019 the practice of providing the public, prospective employees and Government of Nunavut officials listings of current Hope Bay jobs. This listing has been enhanced to include a listing of post secondary college, university or technical schools that provide relevant training to each type of job listed as a further inducement for interested persons to seek necessary training for Hope Bay jobs. In particular, during the Nunavut Labour Market Forum meeting in November 2019, TMAC provided a detailed analysis of our labour force needs and recruitment challenges to Government of Nunavut officials including those from the Department of Family Services.</p>
Reference:	N/A

New Term and Condition No. 47

New Term and Condition No. 47	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Hope Bay Socio-Economic Working Group, and the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC)
Project Phase:	All Phases
Objective:	To assess the effects of the Proponent's education and training initiatives in the affected Nunavut communities.
Term or Condition:	To the extent that such communications are consistent with and not limited by the Proponent's obligations under the 2015 Hope Bay Inuit Impact and Benefit Agreement (IIBA), the Proponent shall share relevant data (quantitative and qualitative) concerning the implementation and success of training and education programs, with other socio-economic monitoring initiatives including the Hope Bay Socio-Economic Working Group and the Kitikmeot Socio-Economic Monitoring Committee.
Reporting Requirements:	Collaboration and integration initiatives to be included in the Proponent's annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	In 2019, TMAC continues the practise of including detailed and standardized on-the-job training statistics and program summaries as part of our annual Socio-Economic Monitoring reporting.
Reference:	Hope Bay Project: 2018 Socio-Economic Monitoring Program (ERM 2019b)

New Term and Condition No. 48

New Term and Condition No. 48	
Category:	Cultural, Archaeological and Paleontological Impacts
Responsible Parties:	The Proponent and the Government of Nunavut - Department of Culture and Heritage (GN-DCH)
Project Phase:	All Phases
Objective:	To ensure that all archaeological resources that the Proponent identifies in the project development area are fully documented.
Term or Condition:	By February 28 of each year when there are significant footprint changes to the project development area or an archaeological permit is requested, the Proponent will provide the GN-DCH with a series of maps and tables indicating the current status of all archaeological sites within the project development area. The Proponent shall consult with the GN-DCH to establish the contents of the maps and tables that must be submitted.
Reporting Requirements	Recognizing that these detailed maps are to remain confidential, the Proponent is only required to submit this information to the applicable Government of Nunavut representative (Territorial Archaeologist or designate).
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	This condition has been satisfied in consultation with the GN-DCH.
Reference:	Hope Bay Project 2019 Archaeological Investigation Final Permit Report (Points West Heritage Consulting Ltd. 2020) Appendix C-2 of the 2019 NIRB Annual Report

New Term and Condition No. 49

New Term and Condition No. 49	
Category:	Socio-Economic Impacts
Responsible Parties:	The Proponent, Government of Nunavut - Nunavut Housing Corporation, and the Kitikmeot Socio-Economic Monitoring Committee (K-SEMC)
Project Phase:	All Phases
Objective:	To monitor whether the predictions of Project-induced effects of in-migration remain accurate and mitigation measures intended to limit these effects are sufficient.
Term or Condition:	If the Government of Nunavut and the Nunavut Housing Corporation develop an anonymous voluntary housing survey, the Proponent shall make the survey available to Nunavummiut site personnel and the Proponent will return any completed surveys to the Government of Nunavut.
Reporting Requirements:	N/A
Commentary:	It should be noted that interpretation of the results, modifications to the surveys and any reporting of the results remain the responsibility of the authors of the survey, the Government of Nunavut and Nunavut Housing Corporation.
Status for 2019:	N/A
TMAC Comments:	TMAC has received a draft copy and has commented on a proposed housing questionnaire survey in 2019 from the Nunavut Housing Corporation (NHC). To date, it is unknown when and if the Nunavut Housing Corporation will conduct the survey of Hope Bay workers. TMAC remains open to facilitating the delivery of the survey when requested by the NHC.
Reference:	N/A

New Term and Condition No. 50

New Term and Condition No. 50	
Category:	Marine Environment
Responsible Parties:	The Proponent, Indigenous and Northern Affairs Canada, Environment and Climate Change Canada, and Fisheries and Oceans Canada
Project Phase:	Operations, care and maintenance, and closure
Objective:	To assess the environmental impact of the Project on the seabed and marine environment if the effluent discharge pipeline is abandoned in place or removed.
Term or Condition:	The Proponent shall remove the subsea pipeline and diffuser in Roberts Bay when the pipeline is no longer in use unless it can be demonstrated to the satisfaction of the Nunavut Impact Review Board that this infrastructure will provide a net positive environmental effect to the local ecosystem.
Reporting Requirements:	To be included in the Proponent's annual reporting to the NIRB as required.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	TMAC will review options with the Nunavut Impact Review Board at the time when the pipeline and diffuser in Roberts Bay is no longer in use.
Reference:	N/A

6.2 MADRID-BOSTON PROJECT CERTIFICATE NO. 009

New Term and Condition No. 1

New Term and Condition No. 1	
Category	Air Quality - Air Quality Management Plan
Responsible Parties	The Proponent, Environment and Climate Change Canada
Project Phase	All Phases
Objective	To ensure that impacts of the Project on air quality are identified, effectively mitigated and adaptively managed.
Term or Conditions	<p>The Proponent shall maintain an Air Quality Management Plan that addresses the following areas/issues:</p> <ul style="list-style-type: none"> a) regular stack testing of incinerators to demonstrate emissions are within levels predicted or within applicable guidelines or standards; b) continuous NO₂ monitoring and demonstration that NO₂ emissions do not exceed levels impact predictions nor relevant guidelines; and c) implementation of dust suppression measures and demonstration that dustfall and concentrations of suspended particulate matter are within levels predicted or committed to, and within levels or limits established by applicable guidelines and regulations.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, and reported on annually (or more frequently for monitoring results that may already be required under Project Certificate No. 003, such as Term and Condition #30). For years when stack testing has been conducted, the stack testing results must also be reported to Environment and Climate Change Canada (ECCC) as ECCC directs.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC's Air Quality Management Plan (TMAC 2019) addresses this term and condition. The updated Air Quality Management Plan was submitted to the NIRB in April 2019.
Reference:	Hope Bay Project Air Quality Management Plan (TMAC 2019a)

New Term and Condition No. 2

New Term and Condition No. 2	
Category	Climate and Meteorology - Greenhouse Gas Reduction Plan
Responsible Parties	The Proponent
Project Phase	Construction and Operations
Objective	To monitor and reduce greenhouse gas emissions produced by the Project.
Term or Conditions	<p>The Proponent shall maintain a Greenhouse Gas Emissions (GHG) Reduction Plan which includes:</p> <ul style="list-style-type: none"> a) an estimate of the Project's GHG baseline emissions; b) a description of monitoring measures to be undertaken, including the methods, frequency, parameters, and a description the analysis that will be carried out on the monitoring data generated; and c) a description of mitigative and adaptive strategies to reduce project-related greenhouse gas emissions over the Project lifecycle.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	The Project's Greenhouse Gas (GHG) Emissions baseline emissions estimate, monitoring measures, and description of mitigative and adaptive strategies to reduce project-related GHG emissions over the Project lifecycle is provided in Madrid-Boston FEIS, Section 1.6. TMAC will continue to maintain this GHG Reduction Plan as required, including consideration prior to the development of wind power generation.
Reference:	N/A

New Term and Condition No. 3

New Term and Condition No. 3	
Category	Climate and Meteorology - Mine Closure and Reclamation Plan
Responsible Parties	The Proponent
Project Phase	Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective	To ensure mitigation, monitoring, and adaptive management measures are in place for the long-term stability, containment, and integrity of project components and the protection of environmental features.
Term or Conditions	<p>The Proponent shall maintain a Mine Closure and Reclamation Plan that addresses the following areas/issues:</p> <ul style="list-style-type: none"> a) adaptive management approaches for monitoring and mitigation measures to ensure long-term containment of the Tailings Storage Facility and Waste Rock Storage Areas; b) measures to maintain the integrity of the groundwater quality within and adjacent to the Project; and c) estimates of the approximate fill time for the mine pits.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB.
Commentary:	The terms “Tailings Storage Facility”, “Waste Rock Storage Areas” and “mine pit” are intended to apply to the underground workings.
Status for 2019:	Complete
TMAC Comments:	An updated November 2017 Interim Closure and Reclamation Plan for the Doris-Madrid portions of the Project and a November 2017 Conceptual Closure and Reclamation Plan for the Boston portion of the Project were submitted to the NWB and approved with licence issuance in early 2019. No ‘mine pits’ are expected at closure and therefore estimated fill times were not considered. As per the respective Type A Water Licence(s), Closure and Reclamation Plans will be updated every five years.
Reference:	<p>Hope Bay Project Boston Conceptual Closure and Reclamation Plan (SRK 2017a)</p> <p>Hope Bay Project Doris-Madrid Interim Closure and Reclamation Plan (SRK 2017b)</p>

New Term and Condition No. 4

New Term and Condition No. 4	
Category	Noise and Vibration - Noise Abatement and Monitoring
Responsible Parties	The Proponent, Government of Nunavut-Department of Environment, Environment and Climate Change Canada, Health Canada, Fisheries and Oceans Canada
Project Phase	All Phases
Objective	To minimize sensory disturbance to humans and wildlife
Term or Conditions	<p>The Proponent shall, in consultation with the Government of Nunavut-Department of Environment, Environment and Climate Change Canada, and Health Canada, maintain a Noise Abatement Monitoring Plan that addresses the following areas/issues:</p> <ul style="list-style-type: none"> a) measures to protect people, fish, and wildlife, from mine activity noise and vibration, including blasting, drilling, equipment, vehicles and aircraft; b) monitoring of noise at least once during each phase of the Project and following quarry blasts to demonstrate that noise levels c) adaptive management and monitoring measures to be implemented should monitoring identify an exceedance; and d) the procedure employees should follow if they have any noise complaints.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, and reported on annually (or more frequently for monitoring results that may already be required under Project Certificate No. 003, such as Term and Condition #29).
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	<p>TMAC does not maintain a standalone Noise Abatement Plan. For the protection of people, TMAC implements noise monitoring and abatement under its occupational health and safety management program which is reviewed by the WSCC Mines Inspector. For the protection of wildlife, TMAC implements its noise management under its wildlife mitigation and monitoring program. TMAC submitted to NIRB an updated Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a) in December 2019. The 2019 Wildlife Mitigation and Monitoring Program Compliance Report (ERM 2020a), Appendix C-3, was submitted to NIRB's monitoring officer April 1, 2020.</p>
Reference:	<p>Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a)</p> <p>Hope Bay Health and Safety Management Plan (TMAC 2017)</p>

New Term and Condition No. 5

New Term and Condition No. 5	
Category	Acid Rock Drainage and Metal Leaching Management
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To mitigate potential impacts from acid rock drainage and metal leaching.
Term or Conditions	<p>The Proponent shall maintain a stand-alone Acid Rock Drainage and Metal Leaching Management Plan (or equivalent as may be specified under the Type “A” Water Licence) that includes the following information:</p> <ul style="list-style-type: none"> a) procedures for inspection and sampling/testing of waste rock, ore, tailings storage facilities, and quarry source material; b) thermal monitoring of waste rock and tailings storage facilities, including tailings management areas; c) seepage management and monitoring; d) a schedule for reporting of results and periodic updating of predictions for seepage water quality; e) planning for optimal cover conditions above-ground mine- and quarry-related material storage facilities; f) contingency measures that may be implemented if required, including measures to address the potential for leaching of arsenic from waste rock and ore stockpiles, and tailings under neutral pH conditions; g) plans for comparing monitoring results from receiving waters to model predictions; and h) identification of thresholds that will trigger specific management actions, including active water treatment, if trends analyses indicate water quality objectives may be exceeded.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	TMAC has existing Management Plans and standard operating procedures that are in place to address this term and condition including; Hope Bay Project Quarry Management Plan (Dec 2017), Hope Bay Project Waste Rock, Ore and Mine Backfill Management Plan (March 2019), Aquatic Effects Monitoring Plan, and the Doris TIA Operations, Maintenance and Surveillance Manual (SRK 2020). These plans are subject to annual review and will be updated as required and submitted to the NWB and NIRB.
Reference:	<p>Hope Bay Project Quarry Management Plan (TMAC 2017)</p> <p>Hope Bay Project Waste Rock, Ore and Mine Backfill Management Plan (TMAC 2019)</p> <p>Hope Bay Project Aquatic Effects Monitoring Plan (TMAC 2018)</p> <p>Operations, Maintenance and Surveillance Manual: Hope Bay Project, Phase 2, Doris Tailings Impoundment Area - DRAFT (SRK 2020)</p> <p>Type A Water Licence 2AM-DOH1335</p>

New Term and Condition No. 6

New Term and Condition No. 6	
Category	Site-specific Geotechnical Studies, Permafrost Monitoring, Mapping and Thermal Analysis
Responsible Parties	The Proponent
Project Phase	Pre-construction
Objective	To prevent potential impacts to sensitive land features and to ensure the integrity of site infrastructure is maintained through better characterization and monitoring of ground ice conditions and identification of sensitive terrain in the project area.
Term or Conditions	<p>In consultation with applicable regulatory agencies and experts such as Natural Resources Canada, the Proponent shall undertake additional site-specific geotechnical investigations, permafrost monitoring, mapping and thermal analysis to:</p> <ul style="list-style-type: none"> a) document permafrost conditions, including seasonal thaw, amount of ground ice; b) inform the detailed design of project infrastructure, including foundations, such as water management structures, mine site and haul roads, waste rock storage facilities, and tailings storage facilities, including dam structures associated with the Doris North Tailings Impoundment Area; c) inform updates/revisions to management plans related to waste rock, ore, and tailings storage facilities, including adaptive management strategies with clear thresholds for implementation to minimize the potential for impacts from these facilities; and d) ensure the integrity of project infrastructure and components, including tailings cover, is maintained post-closure.
Reporting Requirements:	Results from these studies and updated/revised plans should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction of applicable project components or facilities, with results or updates submitted annually thereafter as when necessary.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	<p>TMAC has existing standard operating procedures that are in place to address this term and condition. The Doris, Madrid and Boston foundation conditions have been well-studied and documented in the Geotechnical Design Parameters and Overburden Summary Report. Construction is executed as per the Technical Specifications and Earthworks and Geotechnical Engineering Report. If required, site specific data and analysis is initiated at the recommendation of the licensed design engineer.</p> <p>Design details are made available in advance of construction as required under Part D, Item 1 of TMAC's Water Licence 2AM-DOH1335 Amendment No. 2. Submissions made to the NWB in 2019 include the Madrid North and South All-Weather Road Detail Design Package and the Madrid North Contact Water Pond Berm. A copy of these reports can be found on the Nunavut Water Board ftp site.</p> <p>Subsequent geotechnical inspections of all surface infrastructure are an annual requirement in response to Part I, Item 9 of Water Licence 2AM-DOH1335. The objective of these annual inspections is to ensure permafrost integrity and confirm that the project's surface infrastructure is performing as intended from a geotechnical perspective.</p>
Reference:	<p>Geotechnical Design Parameters and Overburden Summary Report (SRK 2017)</p> <p>Technical Specifications Earthworks and Geotechnical Engineering Hope Bay Project, Nunavut Canada Revision H - Issue for Construction (SRK 2018)</p> <p>Doris Annual Geotechnical Inspection Report (SRK 2020)</p>

New Term and Condition No. 7

New Term and Condition No. 7	
Category	Erosion Management Plan
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure management of erosion from land disturbance.
Term or Conditions	<p>The Proponent shall maintain an Erosion Management Plan designed to prevent or minimize erosion and its resulting effects from project-related land disturbance. The Plan shall include the following:</p> <ul style="list-style-type: none"> a) identification of specific project activities that require erosion control; b) description of associated erosion issues; and c) specific measures to prevent or minimize erosion.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB.
Commentary:	N/A
Status for 2019:	Completed
TMAC Comments:	TMAC has an existing Doris-Madrid Water Management Plan, which has recently been updated in March 2020, and a Boston Water Management Plan (TMAC 2017b) in place which provide erosion control management measures to prevent and minimize erosion and its resulting effects from project-related land disturbances.
Reference:	<p>Hope Bay Project Doris-Madrid Water Management Plan (TMAC 2020)</p> <p>Hope Bay Project Boston Water Management Plan (TMAC 2017)</p>

New Term and Condition No. 8

New Term and Condition No. 8	
Category	Mine Closure and Reclamation Plan - Progressive Reclamation and Restoration Reflecting Natural Aesthetics and Community Aesthetic Values
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure that disturbed land parcels no longer required for operations are progressively reclaimed with the natural aesthetics restored to the extent practicable.
Term or Conditions	As part of the Mine Closure and Reclamation Plan (or equivalent), the Proponent shall develop and implement a program to progressively reclaim disturbed areas within the project footprint, with an emphasis on restoring the natural aesthetics of the area through re-contouring to the extent practicable. Acceptability of reclamation efforts should be confirmed through the Proponent's public engagement with local communities and discussion of local aesthetic values (e.g., acceptability of the topography and landscape of the project areas following progressive reclamation efforts). Progressive reclamation efforts should also demonstrate consideration for the feasibility of topsoil/organic matter salvage to promote revegetation.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	An updated November 2017 Interim Closure and Reclamation Plan for the Doris-Madrid portions of the Project and a November 2017 Conceptual Closure and Reclamation Plan for the Boston portion of the Project, including a description of the progressive reclamation programs, were submitted and approved by the NRB with licence issuance in early 2019. As per the respective Water Licence(s), the Closure and Reclamation Plan is intended to be updated every five years.
Reference:	Hope Bay Project Boston Conceptual Closure and Reclamation Plan (SRK 2017a) Hope Bay Project Doris-Madrid Interim Closure and Reclamation Plan (SRK 2017b)

New Term and Condition No. 9

New Term and Condition No. 9	
Category	Talik Distribution and Flow
Responsible Parties	The Proponent
Project Phase	All phases
Objective	To provide information on potential project impacts on talik distribution and flow.
Term or Conditions	The Proponent shall implement a Thermal Monitoring Plan to identify potential changes in talik distribution and flow paths that may result from the development of project infrastructure, including underground workings, tailings storage facilities, and water impoundment areas.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, with subsequent updates submitted annually thereafter or as may otherwise be required by the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	Thermal monitoring required of project components is addressed under existing project management plans previously provided to the NIRB or various standard operating procedures and engineering requirements. A geotechnical inspection of the underground workings is conducted annually by a qualified Geotechnical Engineer and considers the groundwater conditions underground and groundwater inflow in the underground mine workings. Thermal monitoring is undertaken as part of the annual geotechnical inspections required under TMAC's Water Licences. These include the Boston Advanced Exploration Project, the Doris-Madrid Project and the Tailings Impoundment Area. If warming of foundations did occur it would be identified through the existing monitoring instrumentation and procedures and mitigation or remediation measures would be evaluated. If relevant, possible impacts to talik distribution and flow paths would be identified.
Reference:	Doris Annual Geotechnical Inspection Report (SRK 2020) Hope Bay Project Groundwater Management Plan (TMAC 2020)

New Term and Condition No. 10

New Term and Condition No. 10	
Category	Surface Water Hydrology, Surface Water Quality, Sediment Quality and Freshwater Aquatic Environment - Aquatic Effects Monitoring Plan, and Water Management Plan
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To mitigate potential impacts to surface waters.
Term or Conditions	<p>Subject to potential receipt of more detailed direction from the Nunavut Water Board, the Proponent shall:</p> <ul style="list-style-type: none"> a) monitor the effects of project activities and infrastructure on surface water quality conditions; b) ensure the monitoring data is sufficient to compare the impact predictions made for the Project with actual monitoring results; c) ensure that the sampling locations and frequency of monitoring is consistent with and reflects the requirements of the Aquatic Effects Monitoring Plan, and Water Management Plan; and d) on an annual basis, compare monitoring results with the impact assessment predictions in the FEIS and will identify any significant discrepancies between impact predictions and monitoring results.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	<p>TMAC has an existing Management Plans in place to address these items including the Doris-Madrid Water Management Plan (TMAC 2020) Boston Water Management Plan (TMAC 2017) and the Aquatic Effects Monitoring Plan (TMAC 2018). These plans are subject to annual review and have been submitted to the NWB and NIRB as required.</p> <p>Surface water quality and hydrology monitoring results, along with comparisons to FEIS impact predictions are presented in the 2019 Aquatic Effects Monitoring Program Report (Appendix C-4) and also in Section 8.</p>
Reference:	<p>Hope Bay Project Aquatic Effects Monitoring Plan (TMAC 2018)</p> <p>Doris Project: 2019 Aquatic Effects Monitoring Program Report</p> <p>Hope Bay Project Doris-Madrid Water Management Plan (TMAC 2020)</p> <p>Hope Bay Project Boston Water Management Plan (TMAC 2017)</p>

New Term and Condition No. 11

New Term and Condition No. 11	
Category	Groundwater and Surface Water Quality, Sediment Quality and Freshwater Aquatic Environment - Aquatic Effects Monitoring Plan
Responsible Parties	The Proponent, Nunavut Water Board, Environment and Climate Change Canada, and Fisheries and Oceans Canada
Project Phase	All Phases
Objective	To mitigate potential impacts to groundwater, surface waters and freshwater aquatic environment.
Term or Conditions	<p>The Proponent shall, reflecting any direction from responsible authorities, maintain an Aquatic Effects Monitoring Program (AEMP) designed to appropriately characterize the receiving environment and ensure that adequate data is available to assess impact predictions made for the Project and prevent adverse impacts from occurring. The AEMP should include measures to:</p> <ul style="list-style-type: none"> a) determine the short and long-term effects in the aquatic environment resulting from the Project; b) evaluate the accuracy of Project effect predictions; c) assess the effectiveness of mitigation and management measures on Project effects; d) identify additional mitigation measures to avert or reduce environmental effects due to Project activities; e) comply with Metal and Diamond Mining Effluent Regulations requirements, should an Environmental Effects Monitoring program be triggered; f) reflect site-specific water quality conditions; g) include details comparing the watershed features from the Aimaokatalok, Windy, and Doris watersheds to the reference watersheds (Reference A, Reference B, Reference C and Reference D lakes and streams); and h) evaluate the mixing and non-mixing portion of the pit.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board (NIRB) prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	<p>TMAC has an existing Hope Bay Project Aquatic Effects Monitoring Plan (TMAC 2018) that includes Boston and Madrid sites to evaluate these measures. This plan is subject to annual review and updated as required.</p> <p>Water quality monitoring results, along with comparisons to FEIS impact predictions are presented in the 2019 Aquatic Effects Monitoring Program Report (Appendix C-4) and also in Section 8.</p>
Reference:	Doris Project: 2019 Aquatic Effects Monitoring Program Report Hope Bay Project Aquatic Effects Monitoring Plan (TMAC 2018)

New Term and Condition No. 12

New Term and Condition No. 12	
Category	Freshwater Aquatic Environment - Setbacks
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To mitigate impacts of runoff/sedimentation from project quarries and borrow pits into freshwater aquatic habitat.
Term or Conditions	Unless otherwise authorized, the Proponent shall maintain an appropriate setback distance between project quarries and borrow pits from fish-bearing or permanent waterbodies as required to prevent acid rock drainage or metal leaching into such waterbodies and to mitigate the potential for impacts from runoff/sedimentation associated with project quarries and borrow pits.
Reporting Requirements:	The Proponent shall provide information regarding quarry setback distances maintained and/or mitigation measures implemented in fulfillment of this Term and Condition in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC continues to maintain an appropriate setback distance between project quarries and borrow pits from fish-bearing or permanent waterbodies as required to prevent to water quality impacts associated with project quarries and borrow pits.
Reference:	Hope Bay Project Quarry Management Plan (TMAC 2017)

New Term and Condition No. 13

New Term and Condition No. 13	
Category	Freshwater Aquatic Environment - Watercourses
Responsible Parties	The Proponent, Fisheries and Oceans Canada
Project Phase	All Phases
Objective	To prevent blockages or restrictions to fish passages.
Term or Conditions	The Proponent shall ensure that all project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent or limit the movement of water or fish species in fish bearing streams and rivers, unless otherwise authorized by Fisheries and Oceans Canada.
Reporting Requirements:	The Proponent shall report on how it has maintained and/or implemented mitigation measures in fulfillment of this Term and Condition in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC continues to ensure that all project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent or limit the movement of water or fish species in fish bearing streams and rivers, unless otherwise authorized by Fisheries and Oceans Canada. See Section 2 of the 2019 NIRB Report for relevant fisheries related authorizations.
Reference:	2019 NIRB Report, Section 2

New Term and Condition No. 14

New Term and Condition No. 14	
Category	Freshwater Aquatic Environment - Blasting
Responsible Parties	The Proponent, Fisheries and Oceans Canada
Project Phase	All Phases
Objective	To mitigate impacts of explosives use on fish and fish habitat.
Term or Conditions	The Proponent shall engage with Fisheries and Oceans Canada to develop project specific thresholds, mitigation and monitoring for any blasting activities that would exceed the requirements of Fisheries and Oceans Canada's <i>Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters</i> .
Reporting Requirements:	If project-specific thresholds, mitigation and monitoring requirements are developed, the Proponent shall identify these requirements in the annual report provided to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	No project-specific thresholds, mitigation and monitoring requirements were developed or sought from Fisheries and Oceans Canada for blasting activities in 2019.
Reference:	-

New Term and Condition No. 15

New Term and Condition No. 15	
Category	Freshwater Aquatic Environment - Winter Ice Road
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To mitigate impacts to fish and fish habitat.
Term or Conditions	The Proponent shall implement all applicable Fisheries and Oceans Canada best management practices to avoid and mitigate serious harm to fish as a result of the construction, operations, and decommissioning of winter ice roads, and from under ice water withdrawals. This includes adequately screening the water intake pipes to prevent impingement and entrainment of fish.
Reporting Requirements:	Information regarding best management practices and/or mitigation measures implemented by the Proponent in fulfillment of this Term and Condition shall be provided in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	Water was used from Doris Lake and Patch Lake for seasonal winter ice track construction in January, February, and April 2019. Water use during winter track construction and operations was supervised by TMAC's Environmental Department to ensure applicable Fisheries and Oceans Canada guidance was followed, including adequately screening the water intake pipes to prevent impingement and entrainment of fish.
Reference:	-

New Term and Condition No. 16

New Term and Condition No. 16	
Category	Freshwater Aquatic Environment - Water Crossings
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To mitigate impacts to fish and fish habitat.
Term or Conditions	The Proponent shall implement all applicable Fisheries and Oceans Canada best management practices to avoid and mitigate serious harm to fish as a result of water crossing construction, operations, and decommissioning for all fish-bearing water crossings.
Reporting Requirements:	Information regarding best management practices and/or mitigation measures implemented by the Proponent in fulfillment of this Term and Condition shall be provided in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC continues to implement applicable Fisheries and Oceans Canada management practices to avoid and mitigate harm to fish as a result of water crossing construction, operations, and decommissioning for all fish-bearing water crossings. For all fish bearing water crossings, TMAC consults with Fisheries and Oceans Canada prior to commencement of any work to discuss required approvals, preferred approaches and applicable management practices. See Section 2 of the 2019 NIRB Report for relevant fisheries related authorizations for the Project.
Reference:	2019 NIRB Report, Section 2

New Term and Condition No. 17

New Term and Condition No. 17	
Category	Vegetation - invasive and rare plant species
Responsible Parties	The Proponent, Government of Nunavut
Project Phase	All Phases
Objective	To prevent the introduction of invasive plant species and protect rare plant species.
Term or Conditions	<p>The Proponent shall maintain a section in the Wildlife Mitigation and Monitoring Plan (WMMP) on invasive plant species and rare plant species with details on the following:</p> <ul style="list-style-type: none"> a) mitigation to prevent the introduction of invasive plant species, for example, via inspection of vehicles and equipment brought to site; b) protocols for monitoring for invasive plant species, with reference to geographic scope and frequency, and commitment to monitor through post-closure; c) measures to ensure that any introductions of non-indigenous plant species are promptly reported to the Government of Nunavut - Department of Environment; d) mitigation to prevent the successful establishment of invasive species that may be introduced to the project area as a result of project activities.; and e) summary of loss of potential rare plant habitat when construction occurs in new areas.
Reporting Requirements:	A description of monitoring and mitigation undertaken and a summary of related results related to introduction of invasive plant and protection of rare plants shall be provided in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	<p>The WMMP (December 2019) provides an overview of mitigation for invasive plants and a requirement to report any observations to the Government of Nunavut - Department of Environment.</p> <p>The WMMP (December 2019) includes a provision to report on loss of potential rare plant habitat when construction occurs in new areas.</p>
Reference:	-

New Term and Condition No. 18

New Term and Condition No. 18	
Category	Vegetation - revegetation
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To encourage re-establishment of native plant species in disturbed areas.
Term or Conditions	The Proponent shall ensure that the progressive reclamation efforts outlined in its Mine Closure and Reclamation Plan or equivalent encourage recolonization by native plant species. These efforts are expected to be informed by revegetation trials in the Project area and must include monitoring protocols over sufficient timeframes to measure success and ensure invasive plant species have not established.
Reporting Requirements:	The extent of progressive reclamation activities undertaken and measures of their success shall be summarized within the Proponent's annual reports submitted to the NIRB.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	An updated November 2017 Interim Closure and Reclamation Plan for the Doris-Madrid portions of the Project and a November 2017 Conceptual Closure and Reclamation Plan for the Boston portion of the Project, including a description of the progressive reclamation programs, were submitted and approved by the NWB with licence issuance in early 2019. As per the respective Water Licence(s), the Closure and Reclamation Plan is intended to be updated every five years however TMAC will report on progressive reclamation results as they become available. See the 2019 Nunavut Water Board Annual Report, Section 13.1 for more detail on TMAC's 2019 progressive reclamation efforts.
Reference:	Hope Bay Project Boston Conceptual Closure and Reclamation Plan (SRK 2017a) Hope Bay Project Doris-Madrid Interim Closure and Reclamation Plan (SRK 2017b) 2019 Nunavut Water Board Annual Report, Section 13.1 (TMAC 2020)

New Term and Condition No. 19

New Term and Condition No. 19	
Category	Wildlife and Wildlife Habitat - Wildlife Mitigation and Monitoring Plan
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure a holistic and comprehensive approach to mitigate, monitor, and adaptively manage potential impacts to wildlife.
Term or Conditions	<p>The Proponent shall maintain either a Project-specific Wildlife Mitigation and Monitoring Plan (WMMP) or include the Project-specific details in a belt-wide plan (integrated with the similar plans required in Project Certificate No. 003 for the Doris North Gold Mine Project). The WMMP must include detailed monitoring, mitigation, and adaptive management measures for wildlife (including identification of any enhanced mitigation associated with Species At Risk), with consideration for each Project activity predicted to affect wildlife, with specific triggers for mitigation and adaptive management intervention. Other wildlife-specific management plans required by the Project Certificate may also be incorporated into the WMMP as appropriate, provided they are clearly identified within the document. The WMMP should highlight the Proponent's efforts to align its Project-specific wildlife monitoring with broader regional initiatives for wildlife monitoring and addressing cumulative effects.</p> <p>The Proponent is expected to develop an audit process with relevant parties to identify updates to the WMMP that may be required, particularly to address significant changes in Project development plans, monitoring results indicating biologically-meaningful changes, significant updates to the understanding of best management practices, Inuit Qaujimaningit or Traditional Knowledge which is shared with the Proponent, changes in climatic conditions that might subject wildlife to unexpected impacts, or as otherwise necessary.</p>
Reporting Requirements:	The Proponent shall submit a revised Plan to the Nunavut Impact Review Board (NIRB) within one (1) year of issuance of the Project Certificate. The Proponent shall provide summaries of its implementation in respect to the requirements of the Plan within its annual reporting to the NIRB, with required updates identified through its audit process highlighted.
Commentary:	The term "audit process" is not intended to impose the requirement to adopt a standardized audit protocol, but rather to require that a process is adopted by the Proponent, in collaboration with the parties, to ensure periodic review of the WMMP occurs and updates to the WMMP are undertaken when the review identifies that revisions are necessary.
Status for 2019:	Complete
TMAC Comments:	TMAC has updated the Wildlife Mitigation and Monitoring Plan (WMMP) in December 2019 as a single plan to address wildlife issues for both NIRB certificate 003 and 009 across the Hope Bay belt.
Reference:	WMMP (December 2019).

New Term and Condition No. 20

New Term and Condition No. 20	
Category	Wildlife and Wildlife Habitat - Road Traffic Management
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To minimize impacts to terrestrial wildlife from road traffic.
Term or Conditions	<p>The Proponent shall maintain a Road Management Plan which includes:</p> <ul style="list-style-type: none"> a) maintenance of traffic logs and traffic counters along the all-weather road between the Doris-Madrid mine sites and Madrid-Boston mine sites. Where traffic levels exceed levels predicted for the Project, the Proponent shall develop and implement appropriate enhancements to its wildlife protection measures; b) information regarding the road design, safety barriers, berms and features designed to ensure safe wildlife movement; c) description of safety protocols and enforcement by the Proponent, including restrictions imposed during periods of low visibility, and training provided to road users; and d) program to monitor snow bank heights along Project roads to ensure they do not pose a barrier to movement of wildlife or other land users.
Reporting Requirements:	The Plan shall be provided to the Nunavut Impact Review Board (NIRB) prior to the commencement of construction. An annual summary of the monthly maximum, minimum, and average traffic levels shall be provided to the NIRB in the Proponent's annual report, with an analysis of the effectiveness of mitigation for adverse impacts to wildlife from road operations.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC has updated the Wildlife Mitigation and Monitoring Plan (WMMP) in December 2019 as a single plan to address wildlife issues for both NIRB certificate 003 and 009 across the Hope Bay belt, including road traffic management, as described in Term & Condition #20.
Reference:	WMMP (December 2019). Road management is discussed in Section 2.6.

New Term and Condition No. 21

New Term and Condition No. 21	
Category	Wildlife and Wildlife Habitat - Wildlife Mitigation Measures
Responsible Parties	The Proponent, the Government of Nunavut
Project Phase	All Phases
Objective	To ensure that specific criteria and procedures are developed should wildlife be deemed project-tolerant.
Term or Conditions	In consultation with the Government of Nunavut and other relevant authorities, the Proponent shall include criteria and procedures within its Wildlife Mitigation and Monitoring Plan (WMMP) governing the deterrence of wildlife from blast zones and the relaxation of mitigation measures for animals deemed Project-tolerant.
Reporting Requirements:	The Proponent shall provide a summary discussion of its implementation of this Term and Condition to the Nunavut Impact Review Board (NIRB) through the Proponent's annual monitoring report.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC has updated the Wildlife Mitigation and Monitoring Plan (WMMP) in December 2019 as a single plan to address wildlife issues for both NIRB certificate 003 and 009 across the Hope Bay belt, including mitigation for caribou and other wildlife near blasting areas.
Reference:	WMMP (December 2019). Mitigation for caribou and other wildlife surrounding blasting is included in Section 2.9.

New Term and Condition No. 22

New Term and Condition No. 22	
Category	Wildlife and Wildlife Habitat - Caribou and Muskox Mitigation Measures
Responsible Parties	The Proponent, the Government of Nunavut
Project Phase	All Phases
Objective	To mitigate potential impacts to caribou and muskox from project activities.
Term or Conditions	In collaboration with the Government of Nunavut, the Proponent shall specify within its Wildlife Mitigation and Monitoring Plan specific mitigation measures, trigger distances, and group size thresholds for the protection of caribou and muskox in proximity to project activities (e.g., blasting, heavy truck traffic, and aircraft).
Reporting Requirements:	The Proponent shall provide a summary discussion of its implementation of this Term and Condition to the Nunavut Impact Review Board (NIRB) through the Proponent's annual monitoring report.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC has updated the Wildlife Mitigation and Monitoring Plan (WMMP) in December 2019 as a single plan to address wildlife issues for both NIRB certificate 003 and 009 across the Hope Bay belt, including measures for the protection of caribou and muskox in proximity to Project activities.
Reference:	WMMP (December 2019). Mitigation for potential effects of noise on caribou and muskox is included in Section 2.2.2.

New Term and Condition No. 23

New Term and Condition No. 23	
Category	Wildlife and Wildlife Habitat - Wildlife Monitoring and Adaptive Management Measures
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure that all direct wildlife mortalities are reported and considered in the development of adaptive management protocols.
Term or Conditions	The Proponent shall file an incident report with the local wildlife conservation office for all direct wildlife mortalities that occur in association with the Project. Incident reports should include sufficient detail to demonstrate how monitoring and mitigation measures failed to prevent the mortality, as well as information pertaining to what measures would be put in place to prevent the incident from reoccurring.
Reporting Requirements:	A summary regarding incidents reported in fulfillment of this Term and Condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	Reports of wildlife interactions, incidents and mortalities are reported to NIRB by the Environmental Superintendent as required and are included as results and appendix in the annual Wildlife Mitigation and Monitoring Plan Compliance report.
Reference:	See Section 3.2.2 Wildlife Interactions, Incidents and Mortalities in the 2019 Wildlife Mitigation and Monitoring Program Compliance Report (ERM 2020a).

New Term and Condition No. 24

New Term and Condition No. 24	
Category	Wildlife and Wildlife Habitat - Wildlife Mitigation and Monitoring Measures
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To mitigate potential impacts to wildlife through interaction with water attenuation ponds and/or tailings storage areas.
Term or Conditions	The Proponent shall implement measures to prevent the use of water attenuation ponds and tailings storage areas by wildlife, including waterfowl, other migratory birds, and caribou, with sufficient monitoring to assess whether these measures are effective or whether further deterrents may be required.
Reporting Requirements:	The Proponent shall provide a summary discussion of its implementation of this Term and Condition to the Nunavut Impact Review Board (NIRB) through the Proponent's annual monitoring report.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC has updated the Wildlife Mitigation and Monitoring Plan (WMMP) in December 2019 as a single plan to address wildlife issues for both NIRB certificate 003 and 009 across the Hope Bay belt, including measures to mitigate potential effects of wildlife interacting with Project ponds.
Reference:	WMMP (December 2019). Mitigation for wildlife use of Project ponds is discussed in Sections 2.2.6, 2.2.7, and 3.1.11.1.

New Term and Condition No. 25

New Term and Condition No. 25	
Category	Wildlife and Wildlife Habitat - Transmission Lines
Responsible Parties	The Proponent
Project Phase	Pre-construction
Objective	To ensure wildlife movement and use of project areas is not adversely affected by transmission lines.
Term or Conditions	The Proponent shall conduct an assessment of the potential for its planned transmission lines to impact the movement and use of project areas by caribou, birds and other wildlife species, as well as other land users. The Proponent will demonstrate how its assessment has informed the selection of a final design for this infrastructure, its siting, operation and decommissioning, and any associated updates to its Wildlife Mitigation and Monitoring Plan to evaluate the effectiveness of planned mitigation.
Reporting Requirements:	The Proponent shall provide the Nunavut Impact Review Board with the outcomes of its assessment and associated updates to its Plan in support of the implementation of this Term and Condition at least 180 days prior to construction of transmission lines for the Project.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	To be completed at least 180 days prior to construction of transmission lines for the Project. No transmission lines are planned to be constructed in 2020.
Reference:	-

New Term and Condition No. 26

New Term and Condition No. 26	
Category	Birds and Bird Habitat - Tailings Impoundment Area
Responsible Parties	The Proponent, Environment and Climate Change Canada, Inuit Environmental Advisory Committee
Project Phase	All Phases
Objective	To mitigate potential impacts to birds from the Tailings Impoundment Area and contact water ponds.
Term or Conditions	<p>The Proponent shall monitor usage of contact water ponds by water birds and shorebirds and shall conduct a baseline survey for water birds and shorebirds at the Tailings Impoundment Area (TIA) to characterize the bird community and use of the TIA. Survey methodology shall be determined in consultation with Environment and Climate Change Canada (ECCC).</p> <p>If surveys indicate that birds are using the TIA or other contact water ponds, the Proponent shall conduct a toxicological risk assessment in consultation with ECCC; and if that risk assessment indicates that there is a reasonable risk to birds from the TIA, the Proponent shall monitor for ongoing bird usage of the TIA and shall engage with the Inuit Environmental Advisory Committee and ECCC to establish appropriate methods for deterrence of water birds.</p>
Reporting Requirements:	A summary of the results of baseline surveys, risk assessment, engagement with the Inuit Environmental Advisory Committee (IEAC) and Environment and Climate Change Canada (ECCC), and follow-up monitoring shall be provided in the Proponent's annual report submitted to the NIRB (or more frequently for monitoring results that may already be required under Project Certificate No. 003, such as Term and Condition #26).
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	<p>TMAC has updated the Wildlife Mitigation and Monitoring Plan (WMMP) in December 2019 as a single plan to address wildlife issues for both NIRB certificate 003 and 009 across the Hope Bay belt. The WMMP Plan includes measures for monitoring water quality in the TIA, conducting a toxicological risk assessment if needed, and deterring birds if necessary.</p> <p>Characterization of the bird community surrounding the TIA and reference ponds was conducted in 2018 in collaboration with ECCC and reported to the NIRB and ECCC as part of the 2018 WMMP Report.</p>
Reference:	WMMP (December 2019). Mitigation for waterbirds in the TIA is discussed in Section 3.1.11.1.

New Term and Condition No. 27

New Term and Condition No. 27	
Category	Birds and Bird Habitat - Raptor Mitigation Measures
Responsible Parties	The Proponent
Project Phase	Pre-Construction and Construction
Objective	To mitigate potential impacts to raptors from project construction.
Term or Conditions	<p>Should it be necessary to undertake Project-related construction within the raptor-breeding period, the Proponent shall conduct a pre-construction survey of potential cliff-nesting habitat within two (2) kilometres (km) of the construction area to ensure all nesting sites have been accounted for in advance of construction commencing. If an active cliff nest is located within one (1) km of the planned construction areas, construction activities shall not commence until a nest-site protection plan has been developed in consultation with the Government of Nunavut - Department of Environment (GN-DoE) to address:</p> <ul style="list-style-type: none"> a) inclusion of appropriate setbacks and buffers, with exceptions potentially requiring formal authorization from the Government of Nunavut; b) measures for instances where raptors build a nest on project infrastructure such as a service building and cessation of construction activities would not apply; and c) monitoring and mitigation measures for all potential nest sites within one (1) km of project activities.
Reporting Requirements:	The Proponent shall report on its implementation of this Term and Condition and provide a summary of the results of pre-construction raptor nest surveys undertaken and nest-specific management plans developed within the Proponent's annual report submitted to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC has updated the Wildlife Mitigation and Monitoring Plan (WMMP) in December 2019 as a single plan to address wildlife issues for both NIRB certificate 003 and 009 across the Hope Bay belt. The WMMP Plan includes measures for monitoring of raptors should construction occur during the breeding season and the development of a nest management plan in consultation with the GN-DoE.
Reference:	WMMP (December 2019). Mitigation for raptor nests is discussed in Sections 3.1.12 and Section 2.5.

New Term and Condition No. 28

New Term and Condition No. 28	
Category	Birds and Bird Habitat - Site-wide and wind-turbine monitoring
Responsible Parties	The Proponent
Project Phase	Operations
Objective	To prevent adverse impacts to birds from project activities and infrastructure including wind turbines.
Term or Conditions	<p>The Proponent shall maintain in either a separate Migratory Birds Protection Plan or with these contents clearly identified, as an addition to the Wildlife Mitigation and Monitoring Plan, a plan which:</p> <ul style="list-style-type: none"> a) specifies measures designed for the protection of birds from operation of wind turbines, with additional preventative measures to be implemented during periods of poor visibility within peak bird migration periods; b) includes protocols for bird mortality monitoring within the general area of the wind turbines, and for contribution of data to regional bird research / monitoring programs; and c) includes adaptive management measures - including those that may be in place at other sites in northern Canada - that may be implemented should mortalities be greater than expected.
Reporting Requirements:	The Plan described above shall be provided to the Nunavut Impact Review Board (NIRB) prior to installation of wind turbines for the Project, with a summary of monitoring results included in the Proponent's annual report to the NIRB.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	No wind turbines were constructed in 2019, nor expected to commence in 2020. To be completed prior to installation of wind turbines for the Project.
Reference:	-

New Term and Condition No. 29

New Term and Condition No. 29	
Category	Marine Environment - Shipping Management Plan
Responsible Parties	Proponent
Project Phase	All Phases
Objective	To ensure that the general public can access information on how potential impacts from project-related shipping activities will be mitigated.
Term or Conditions	<p>The Proponent shall maintain a standalone Shipping Management Plan which provides an overview of:</p> <ul style="list-style-type: none"> a) applicable legislation, regulations, guidelines, and commitments designed to address potential adverse ecosystemic effects of shipping activities to the marine environment; b) non-confidential contracting provisions imposed by the Proponent on contractors used for project-related marine shipping that are designed to address potential adverse ecosystemic effects of shipping activities to the marine environment; c) procedures for providing advance notice of Project-related shipping activities to potentially-affected communities; and d) updates to Project shipping activities implemented to address concerns identified through the Proponent's public engagement efforts.
Reporting Requirements:	The Plan should be submitted to the Nunavut Impact Review Board prior to the start of shipping activities, with subsequent updates or revisions to the Plan submitted annually thereafter.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC maintains a Shipping Management Plan (TMAC 2020) for the Project that addresses applicable legal requirements, requirements of contractors to address potential adverse ecosystemic effects to the marine environment, and relevant notification procedures. This plan is a living document that will continue to be updated as required to address concerns identified through the Proponent's public engagement efforts. The Hope Bay Shipping Management Plan was presented and explained to the public and interested stakeholders at a meeting in October 2019 conducted by the Ekaluktutiak Hunters and Trappers Organization and Transport Canada in reference to icebreaking.
Reference:	Hope Bay Project Shipping Management Plan (TMAC 2020)

New Term and Condition No. 30

New Term and Condition No. 30	
Category	Marine Environment - Shipping Contractors
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure that marine shipping contractors meet all applicable regulatory requirements.
Term or Conditions	The Proponent shall contract only Transport Canada certified vessels to carry cargo or fuel for the Project and shall ensure shippers are informed of the Proponent's applicable management plans and commitments designed to address potential adverse ecosystemic effects of shipping activities to the marine environment.
Reporting Requirements:	The Proponent shall demonstrate its compliance with this Term and Condition within its Plan and associated annual reporting to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC confirms it contracts only Transport Canada certified vessels to carry cargo or fuel for the Project as required by law. TMAC issues the Shipping Management Plan (TMAC 2020) to shippers to inform them of any relevant commitments and management requirements designed to address potential adverse ecosystemic effects of shipping activities to the marine environment related to the Project.
Reference:	Hope Bay Project Shipping Management Plan (TMAC 2020)

New Term and Condition No. 31

New Term and Condition No. 31	
Category	Marine Environment - Marine Wildlife Mitigation
Responsible Parties	Proponent, Fisheries and Oceans Canada, and Environment and Climate Change Canada
Project Phase	All Phases
Objective	To ensure that marine shipping activities avoid adversely impacting seabirds and marine mammals.
Term or Conditions	The Proponent shall provide its contracted vessel operators with maps and descriptions of key marine bird habitats as well as information on sensitive marine mammal habitats in the Northwest Passage, updated annually to include newly published information as it becomes available. The guidance package shall specify that, subject to vessel safety requirements, key wildlife habitats shall be avoided by a distance of at least 500 metres, and wildlife are to be given the right of way. The Proponent shall work with Fisheries and Oceans Canada to ensure that marine mammal mitigation measures common for all vessels in the Canadian Arctic are applied to project-contracted vessels as appropriate.
Reporting Requirements:	The Proponent shall demonstrate its compliance with this Term and Condition within its Plan and shall comment on the effectiveness of these measures within its associated annual reporting to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC issues the Shipping Management Plan (TMAC 2020) to shippers which provides vessel operators with maps and descriptions of key marine bird habitats as well as information on sensitive marine mammal habitats in the Northwest Passage. The Shipping Management Plan specifies that, subject to vessel safety requirements, indicated key wildlife habitats shall be avoided by a distance of at least 500 metres, and wildlife are to be given the right of way.
Reference:	Hope Bay Project Shipping Management Plan (TMAC 2020)

New Term and Condition No. 32

New Term and Condition No. 32	
Category	Marine Shipping - Vessel strikes
Responsible Parties	Proponent
Project Phase	All Phases
Objective	To ensure that marine shipping activities avoid seabirds and marine mammals.
Term or Conditions	The Proponent shall ensure that shippers retained for project related shipping immediately report any accidental contact by project vessels with marine mammals or seabird colonies to Fisheries and Oceans Canada and Environment and Climate Change Canada respectively. The Proponent shall also ensure that the circumstances of the incident are investigated to determine if additional mitigative measures are required.
Reporting Requirements:	A summary of any vessel strikes, and any adaptive management steps undertaken, shall be included in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC issues the Shipping Management Plan (TMAC 2020) to shippers which includes provisions to report any accidental contact by project vessels with marine mammals or seabird colonies to TMAC and the appropriate regulatory authority as required by legislation and within 24 hours.
Reference:	Hope Bay Project Shipping Management Plan (TMAC 2020)

New Term and Condition No. 33

New Term and Condition No. 33	
Category	Marine Environment - Noise Monitoring
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure that project activities and project-related marine shipping do not cause unacceptable noise exposure to marine wildlife.
Term or Conditions	The Proponent shall develop a monitoring protocol for assessing disturbance to marine wildlife resulting from project-related underwater noise in Roberts Bay, and to facilitate assessment of the potential short term, long term, and cumulative effects of project-related noise (including vessel noise in Roberts Bay) on marine wildlife. The Proponent is expected to work with Fisheries and Oceans Canada to determine appropriate indicators and thresholds that can be used to determine if negative impacts on marine wildlife are occurring, and adaptive management measures to mitigate adverse impacts of project-related noise.
Reporting Requirements:	The monitoring protocol should be incorporated into an appropriate management plan and shall be provided to the Nunavut Impact Review Board (NIRB) prior to commencement of construction and project-related shipping, with summary discussion of associated implementation included within annual reporting to the NIRB.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	To be addressed prior to the start of marine construction activities which are related to Madrid-Boston. No marine infrastructure related to Madrid-Boston was constructed in 2019, nor expected to commence in 2020.
Reference:	-

New Term and Condition No. 34

New Term and Condition No. 34	
Category	Economic Development and Opportunities - Socio-Economic Monitoring
Responsible Parties	The Proponent, the Kitikmeot Inuit Association, Government of Nunavut, Indigenous and Northern Affairs Canada, and Kitikmeot communities
Project Phase	All Phases
Objective	To assess the socio-economic impact of the Project on affected communities of Nunavut.
Term or Conditions	<p>The Proponent shall continue to be an active member in the Hope Bay Socio-Economic Working Group. Invited members of this Working Group shall include the Proponent, the Government of Nunavut, Indigenous and Northern Affairs Canada, and the Kitikmeot Inuit Association. Working Group members may invite new participants on an as needed basis.</p> <p>The central focus of the Hope Bay Socio-Economic Working Group shall be on collaborating to ensure that the Hope Bay Socio-Economic Monitoring Plan provides for appropriate Project-specific socio-economic effects monitoring as required throughout the life of the Project. The Hope Bay Socio-Economic Monitoring Plan shall apply to the Project as described in the Final Environmental Impact Statement (FEIS) for the Project.</p> <p>The Proponent shall submit an updated Hope Bay Socio-Economic Monitoring Plan to the Hope Bay Socio-Economic Working Group for review within one (1) year of the issuance of a Project Certificate.</p>
Reporting Requirements:	The Proponent shall, reflecting the input of the Hope Bay Socio-Economic Working Group, report annually to the Nunavut Impact Review Board (NIRB) on implementation of the Hope Bay Socio-Economic Monitoring Plan. The NIRB strongly suggests the use of a standardized reporting template to ensure consistent data collection and tracking of data trends in a comparable form to be shared upon request at the regional level and to minimize the duplication of efforts.
Related Terms and Conditions in PC No. 003 (as amended)	Terms and Conditions No. 28 and 40
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC continues to be an active member of the Hope Bay Socio-Economic Monitoring Working Group (SEMWG) and completes annual Hope Bay Socio-Economic Monitoring Program Reports in consultation with the SEMWG. In April 2019, TMAC submitted a final draft of a revised Hope Bay Socio-Economic Monitoring Program to the SEMWG. The updated program reflects Phase 2 FEIS Final Hearing Report considerations and commitments, as well as relevant Terms and Conditions of the Madrid-Boston (Phase 2) Project Certificate. The SEMWG has approved the updated program and this document filed with the NIRB. The document was finalized in December of 2019.
Reference:	Hope Bay Project: Socio-Economic Monitoring Program Update (ERM 2019)

New Term and Condition No. 35

New Term and Condition No. 35	
Category	Economic Development and Opportunities - Temporary or Final Closure
Responsible Parties	The Proponent, Hope Bay Socio-Economic Working Group, and the Kitikmeot Socio-Economic Monitoring Committee
Project Phase	Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective	To prepare for, monitor and mitigate the potential socio-economic effects of temporary or permanent mine closure on the affected communities of Nunavut.
Term or Conditions	Within six (6) months following an unanticipated temporary or final closure, and at least two (2) years prior to the planned Final Closure of the Project, the Proponent shall, in collaboration with the Hope Bay Socio-Economic Working Group submit an updated Hope Bay Socio-Economic Monitoring Plan to the Kitikmeot Socio-Economic Monitoring Committee that will also include detail regarding specific measures that may mitigate the potential for negative effects as a result of the Project's temporary or permanent closure.
Reporting Requirements:	The Proponent shall submit the updated Hope Bay Socio-Economic Monitoring Plan to the Nunavut Impact Review Board (NIRB) at the same time as to the Kitikmeot Socio-Economic Monitoring Committee.
Related Terms and Conditions in PC No. 003 (as amended)	Terms and Conditions No. 41 and 42
Commentary:	The term "collaboration" as used in this term and condition and throughout the Project Certificate requires the Proponent and parties identified to work jointly together in respect of the issues specified and is indicative of more active participation by collaborating parties in joint decision-making than is expected when the requirements for third party involvement with the Proponent are stated to require "consultation" or "communication" with other parties.
Status for 2019:	N/A
TMAC Comments:	No temporary or final closure of the Madrid-Boston portions of the Project occurred in 2019.
Reference:	-

New Term and Condition No. 36

New Term and Condition No. 36	
Category	Economic Development and Opportunities - Temporary or Final Closure
Responsible Parties	The Proponent, Hope Bay Socio-Economic Working Group, and the Kitikmeot Socio-Economic Monitoring Committee
Project Phase	Temporary Closure/Care and Maintenance, Closure and Post-Closure
Objective	To prepare for, monitor and mitigate the potential socio-economic effects of temporary or permanent mine closure on the affected communities of Nunavut.
Term or Conditions	Within six (6) months following an unanticipated temporary or final closure, and at least two (2) years prior to the planned Final Closure of the Project (regardless of whether the Project has, at that time, already ceased operations, is being maintained in a temporarily closed phase or has already entered the final closure phase), the Proponent shall, submit an updated Human Resources Plan and Wellness Strategy for the Project that includes a Workforce Transition Strategy designed to mitigate the potential negative effects of Project closure on the affected communities of Nunavut.
Reporting Requirements:	The Proponent shall submit the updated plans to the Nunavut Impact Review Board (NIRB) in accordance with the timelines prescribed.
Related Terms and Conditions in PC No. 003 (as amended)	Terms and Conditions No. 43 and 44
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	No temporary or final closure of the Madrid-Boston portions of the Project occurred in 2019.
Reference:	-

New Term and Condition No. 37

New Term and Condition No. 37	
Category	Economic Development and Business Opportunities - Impacts on Existing Customers
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To monitor the extent to which businesses shift their businesses to become dependent on exclusively providing goods and services to the Proponent, resulting in existing customers losing access to necessary goods and services.
Term or Conditions	The Proponent shall track and report on project procurement of local and regional businesses and competition for access to local and regional businesses by existing customers. Specific indicator(s) to assess the potential for these effects shall be chosen and developed as agreed to by the Hope Bay Socio-Economic Working Group (HBSEWG). Activities related to monitoring and development of mitigation, including use and disclosure of information and data, will adhere to the HBSEWG Terms of Reference.
Reporting Requirements:	Summaries of Socio-Economic Working Group activities, list of indicators, and results of indicator monitoring shall be provided in the Proponent's Socio-Economic Monitoring Program reports as part of the Proponent's annual reports to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC revised the Hope Bay Socio-Economic Monitoring Program in 2019 in consultation with the Hope Bay Socio-Economic Monitoring Working Group (SEMWG). Revisions to monitoring indicators and methods were considered and confirmed with the SEMWG. The Hope Bay Socio-Economic Monitoring Program update was finalized in December 2019 and filed with the NIRB. Reporting requirements are provided in the Hope Bay 2020 Socio-Economic Monitoring Program report.
Reference:	Hope Bay Project: Socio-Economic Monitoring Program Update (ERM 2019) Hope Bay Project: 2020 Socio-Economic Monitoring Program (ERM 2020)

New Term and Condition No. 38

New Term and Condition No. 38	
Category	Employment - Staff Schedule
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To produce accurate labour market information regarding available Project employment and skill requirements for the Project to support economic and employment forecasting.
Term or Conditions	<p>The Proponent is strongly encouraged to submit staff schedule forecasts that, at a minimum, include the following:</p> <ul style="list-style-type: none"> a) Title of positions required by department and division; b) Quantity of positions available by project phase and year; c) Transferable skills, both certified and uncertified which may be required for, or gained during, employment within each position; d) The National Occupational Classification code for each individual position.
Reporting Requirements:	The staff schedule forecasts should be provided on an annual basis to the Kitikmeot Socio-Economic Monitoring Committee, with a summary of forecasting provided in the annual reports to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	During the annual meetings of the Hope Bay Socio-Economic Monitoring Working Group (April 9, 2019) and the Kitikmeot Socio-Economic Monitoring Committee (April 10-11, 2019), TMAC provided a report from its recruitment databased that detailed job vacancies and advertisements. In addition, TMAC's hiring list is updated weekly on the Project website, and the same information is provided to the communities and Community Economic Development Officers (CEDOs). Labour force projections are also shared with GN Department of Family Services.
Reference:	-

New Term and Condition No. 39

New Term and Condition No. 39	
Category	Socio-Economic Impacts - Employment
Responsible Parties	The Proponent, Hope Bay Socio-Economic Working Group
Project Phase	All Phases
Objective	To monitor the socio-economic effects of the Project, including employment, on affected communities of Nunavut and compare these effects to the impact predictions made for the Project.
Term or Conditions	The Proponent, reflecting input from the Hope Bay Socio-Economic Working Group and the Kitikmeot Socio-Economic Monitoring Committee, should include in its annual Hope Bay Socio-Economic Monitoring Plan report levels of Inuit employment at the Project as well as barriers and opportunities to achieving the high levels of employment described on page 3-137 of the Madrid Boston Project Final Environmental Impact Statement.
Reporting Requirements:	Summary information addressing the Proponent's fulfillment of this Term and Condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.
Related Terms and Conditions in PC No. 003 (as amended)	Terms and Conditions No. 28 and 40
Commentary:	To reflect the concerns of the Kitikmeot Inuit Association, the Responsible Ministers have varied the wording in NIRB's recommended Term and Condition #39.
Status for 2019:	Complete
TMAC Comments:	Reporting requirements are provided in the Hope Bay 2020 Socio-Economic Monitoring Program report. Indicators reported describe levels of Inuit employment at the Project, and employment barriers and opportunities are discussed. Comparison to high levels of employment described on page 3-137 of the Madrid-Boston Project FEIS (Characterization of Madrid-Boston Potential Effect on Labour Force Capacity, Operation Phase) will be applicable to socio-economic monitoring when the Madrid-Boston Project enters operation.
Reference:	Hope Bay Project: 2020 Socio-Economic Monitoring Program (ERM 2020)

New Term and Condition No. 40

New Term and Condition No. 40	
Category	Education and Training- Registration of Trades Workers
Responsible Parties	The Proponent, Government of Nunavut
Project Phase	All Phases
Objective	To ensure that the Government of Nunavut has accurate information to assist in its role as overseer of the apprenticeship program in Nunavut and in providing access to training initiatives and programs.
Term or Conditions	The Proponent is encouraged to identify and register all trades occupations, journeypersons, and apprentices working with the Project and make this information available to the Government of Nunavut to assist in delivery of training initiatives and programs.
Reporting Requirements:	Summary information addressing the Proponent's fulfillment of this Term and Condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	All Hope Bay apprentices are registered with the Government of Nunavut Department of Family Services Nunavut Apprenticeship Certification Unit in Iqaluit.
Comments:	To be reported in the 2019 NIRB Annual Report as necessary.
Reference:	-

New Term and Condition No. 41

New Term and Condition No. 41	
Category	Education and Training—Training Opportunities and Transferrable Skills
Responsible Parties	The Proponent, Government of Nunavut, Training Organizations
Project Phase	All Phases
Objective	To ensure that the local, regional, and territorial training opportunities associated with the Project maximize opportunities for the regional workforce to obtain transferable skills and certifications.
Term or Conditions	The Proponent is encouraged to work with training organizations and/or government departments offering mine-related or other training to ensure that Project-specific training programs can yield additional opportunities for residents and employees to gain meaningful and transferable skills and certifications. The Proponent shall maintain an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during project employment. The listing should indicate which of these certifications and licences would be transferable to a similar job site within Nunavut.
Reporting Requirements:	The Proponent should summarize the results of these efforts in the annual Hope Bay socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kitikmeot Socio-Economic Monitoring Committee throughout the life of the Project.
Commentary:	N/A
Status for 2019:	N/A
Comments:	TMAC continues to be an active member of the Nunavut Mine Training Roundtable, a territorial group lead by the Government of Nunavut Department of Economic Development and Transportation aimed at coordinating and supporting mine training, and including representatives from Nunavut Arctic College and the Department of Family Services. TMAC continues to be an active member of the Kitikmeot Employment and Training Stakeholder Working Group lead by the Kitikmeot Inuit Association aimed at coordinating and sharing information on employment and training matters within the Kitikmeot Region. The Working Group provides for representation from municipalities, training organizations, territorial government representatives, and major regional employers. TMAC has worked with the KIA and the Government of Nunavut Department of Economic Development and Transportation in 2019 to negotiate a Memorandum of Understanding between the three parties in order to regularly collaborate and coordinate efforts on priority items such as employment and training. It is anticipated that the MOU will be signed in 2020. TMAC continues to provide to training organizations and government department annual summaries of Hope Bay job listings that include position title, duty summary, necessary skills and certifications, job experience requirements, and a list of Canadian institutions where relevant training and education can be obtained for each position.
Reference:	-

New Term and Condition No. 42

New Term and Condition No. 42	
Category	Population Demographics - Monitoring Demographic Changes
Responsible Parties	The Proponent and the Kitikmeot Socio-Economic Monitoring Committee
Project Phase	Pre-Construction, Construction, Operation, Temporary Closure/Care and Maintenance, Closure, and Post-Closure Monitoring
Objective	Monitoring demographic changes affecting the Kitikmeot communities and the territory as a whole is important to understand and evaluate the Proponent's predictions with regards to population demographics and whether any trends are identified which may be correlated with the Project.
Term or Conditions	Provided the collection and sharing of such information is consistent with and not limited by any Inuit Impact and Benefit Agreement with the Kitikmeot Inuit Association and that employees are willing to voluntarily provide this information, the Proponent should collect and provide project-specific data concerning employee community of residence and number of employees that relocated from the year prior (where available, to and from, for Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak, Kugaaruk). The details of this process will be captured in the terms of reference for the project specific Phase 2 Hope Bay Belt Socio-Economic Monitoring Committee.
Reporting Requirements:	Summaries of this information should be included in the annual Phase 2 Hope Bay Belt socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kitikmeot Socio-Economic Monitoring Committee throughout the life of the Project.
Commentary:	N/A
Status for 2019:	N/A
Comments:	Employee Migration has been included as a Socio-Economic indicator in the updated Hope Bay Socio-Economic Monitoring Plan.
Reference:	-

New Term and Condition No. 43

New Term and Condition No. 43	
Category	Traditional Activity and Knowledge
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To demonstrate the incorporation of Inuit Qaujimaningit through monitoring plans developed for the Project.
Term or Conditions	The Proponent should ensure that the development of all project monitoring plans, associated reporting and updates are undertaken with active engagement of Kitikmeot communities, land users, and harvesters. The Proponent should work with the Kitikmeot Inuit Association, the local Hunters and Trappers Organizations and the Kitikmeot Socio-Economic Monitoring Committee to report on the collection and integration of Inuit Qaujimaningit through its monitoring programs for the Project.
Reporting Requirements:	To the extent that the sharing of such information is consistent with, and not limited by, confidentiality or other agreements, summaries addressing the Proponent's fulfillment of this Term and Condition should be included in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	TMAC continued to make use of the Hope Bay Inuit Environmental Advisory Committee ("IEAC") in 2019. The IEAC met twice in 2019 to provide TMAC and the Kitikmeot Inuit Association with advice on caribou monitoring and fisheries offsetting.
Reference:	-

New Term and Condition No. 44

New Term and Condition No. 44	
Category	Non-Traditional Activity and Resource Use
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To assess and monitor potential project effects on non-traditional activity and knowledge.
Term or Conditions	The Proponent is strongly encouraged to consult with outfitting and guiding businesses that operate in or travel through the regional study area regarding whether project infrastructure or activities is adversely affecting their use and experience of the surrounding environment.
Reporting Requirements:	Summaries of consultation and monitoring undertaken by the Proponent in fulfillment of this Term and Condition should be provided within the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	These summaries can include information regarding positive effects of the Project on non-traditional land users such as support and aid provided by the Proponent to other users of the area.
Status for 2019:	N/A
Comments:	In January 2019, the Bathurst Inlet Hunters and Trappers Organization requested TMAC provide air charter landing services at Doris Mine for sports hunters and guides. Upon review, TMAC refused this request as it was determined that the security risk posed by firearms being brought into the mine site was too great.
Reference:	-

New Term and Condition No. 45

New Term and Condition No. 45	
Category	Heritage Resources - Archaeological and Palaeontological Resources Surveys
Responsible Parties	The Proponent
Project Phase	Pre-construction, Construction, Operations
Objective	To prevent adverse impacts to heritage resources and provide parties with updated information on the status of heritage resources in the project footprint.
Term or Conditions	The Proponent shall conduct archaeological and palaeontological surveys prior to land disturbance related to the Project and report survey results to applicable parties, including the Government of Nunavut - Department of Culture and Heritage.
Reporting Requirements:	Evidence of meeting the requirements of this Term and Condition shall be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	This condition has been satisfied in consultation with the GN-DCH. See Appendix C-2 of the 2019 NIRB Annual Report to describing 2019 archaeological surveys.
Reference:	Hope Bay Project 2019 Archaeological Investigation Final Permit Report (Points West Heritage Consulting Ltd. 2020) Appendix C-2 of the 2019 NIRB Annual Report

New Term and Condition No. 46

New Term and Condition No. 46	
Category	Heritage Resources - Archaeological and Palaeontological Discoveries
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure that any heritage resources encountered are reported to appropriate regulatory authorities.
Term or Conditions	<p>The Proponent shall report any archaeological or palaeontological sites discovered during the construction, operation, and closure phases to the Government of Nunavut - Department of Culture and Heritage and the Kitikmeot Inuit Association. Upon discovering a heritage resources site, the Proponent shall:</p> <ul style="list-style-type: none"> a) Take all reasonable precautions necessary to protect the site until further direction is received from the Government of Nunavut - Department of Culture and Heritage; and b) If it becomes necessary to disturb a heritage resources site, the Proponent shall consult with the Government of Nunavut - Department of Culture and Heritage, the Kitikmeot Inuit Association, and potential impacted communities to establish a site-specific mitigation plan and obtain all necessary authorizations.
Reporting Requirements:	Evidence of meeting the requirements of this Term and Condition shall be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	This condition has been satisfied in consultation with the KIA and GN-DCH. See Appendix C-2 of the 2019 NIRB Annual Report to describing 2019 archaeological surveys.
Reference:	<p>Hope Bay Project 2019 Archaeological Investigation Final Permit Report (Points West Heritage Consulting Ltd. 2020)</p> <p>Appendix C-2 of the 2019 NIRB Annual Report</p>

New Term and Condition No. 47

New Term and Condition No. 47	
Category	Individual and Community Wellness - Health and Wellness
Responsible Parties	The Proponent, the Government of Nunavut
Project Phase	Operations
Objective	To promote employee health and well-being.
Term or Conditions	<p>The Proponent shall</p> <ul style="list-style-type: none"> a) provide workers access to sexual health information throughout the life of the Project; b) inform workers of the range of health and wellness services available on site throughout the life of the Project; and c) participate in discussions and dialogue with the Government of Nunavut Department of Health in connection with project activities, policies, or project-induced health issues that may affect health and social services facilities, programs and services.
Reporting Requirements:	Evidence of meeting the requirements of this Term and Condition, including outcomes from the Proponent's engagement with the Government of Nunavut regarding public health and social services issues of relevance to the Project and communities of the Kitikmeot Region shall be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	Sexual Health information and prophylactics are available at Doris Mine through the site medic. TMAC has determined that frequent community health center closures due to staff shortages, arranging for medical assistance for family members, and scheduling medical appointments and travel is a source of concern and anxiety for TMAC staff from within the Kitikmeot Region. In 2019, TMAC performed a trial of an online private medical service in the Kitikmeot region. It was determined that the online service worked well within the region and could serve to assist employees obtain better quality and timely health care as an employee benefit. TMAC plans to implement the delivery of the selected private online medical service for TMAC employees in early 2020.
Reference:	-

New Term and Condition No. 48

New Term and Condition No. 48	
Category	Individual and Community Wellness - Cross-cultural awareness
Responsible Parties	The Proponent
Project Phase	Operations
Objective	To support the elimination of cultural barriers and promote recognition for Inuit Qaujimaningit to establish a healthy workplace for all Project employees.
Term or Conditions	The Proponent is encouraged to promote consideration for Inuit culture and Inuit Qaujimaningit through the establishment of cross-cultural training initiatives, for all Project employees and on-site sub-contractors. The Proponent should actively monitor the implementation of these initiatives throughout the life of the Project.
Reporting Requirements:	Evidence of meeting the requirements of this Term and Condition shall be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	TMAC continues to deliver cross cultural training to every new Hope Bay employee.
Reference:	-

New Term and Condition No. 49

New Term and Condition No. 49	
Category	Community Involvement Plan
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure appropriate stakeholders are included in ongoing consultation and engagement.
Term or Conditions	<p>The Proponent shall maintain a current Community Involvement Plan which reflects relevant stakeholders with respect to the Project.</p> <p>a) Records of communication and engagement undertaken by the Proponent with stakeholders, including potentially impacted communities, are to be maintained throughout the life of the Project with outcomes reflected in this Plan.</p>
Reporting Requirements:	The Proponent shall provide summaries of any significant community engagement undertaken and resultant updates to the Community Involvement Plan within its annual reports to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	N/A
TMAC Comments:	Details of activities conducted as part of the Community Involvement Plan are included in the 2019 NIRB Annual Report. TMAC currently implements the Hope Bay Project: Community Involvement Plan (TMAC 2016), on a project-wide basis.
Reference:	-

New Term and Condition No. 50

New Term and Condition No. 50	
Category	Human Health and Ecological Risk Assessment - Assessment of Risks from Consumption of Berries near Project Area
Responsible Parties	The Proponent
Project Phase	Construction and Operation
Objective	To minimize the potential risks from consumption of berries containing potential toxic metals.
Term or Conditions	The Proponent shall conduct soil sampling to determine metal levels of soils in areas with berry-producing plants near any of the potential development areas, prior to commencing operations.
Reporting Requirements:	A summary of the results of these additional studies shall be included in the Proponent's annual report to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	<p>During 2019, development occurred at Madrid North and the crown pillar recovery area. These areas are dominated by rock outcrops and open meadows with high soil moisture. Berry-producing plants are not abundant at either location.</p> <p>The area surrounding the Madrid North footprint and the area in the crown pillar recovery was identified by vegetation terrestrial ecosystem mapping as predominantly Wet Meadow, Polygonal Ground, Eriophorum Tussock Meadow and Dryas Herb Mat. Shrub communities and berry-producing plants typically require better drained soils than those found at the site.</p> <p>Soil metals were collected in 2010 during baseline surveys immediately down-wind (within 1.5 km) of the Madrid North and crown pillar recovery areas. The soil samples at these sites contained metals below the Canadian Council of Ministers of the Environment (CCME) Soil Quality Guidelines for the protection of environmental health; Parkland and Industrial Guidelines and Agricultural Guidelines.</p>
Reference:	Madrid-Boston Project: Final Environmental Impact Statement (2018), V4-7A Terrain and Soils Baseline (2010)

New Term and Condition No. 51

New Term and Condition No. 51	
Category	Human Health and Ecological Risk Assessment - Assessment of Risks from Consumption of Fish from Marine/Freshwater Aquatic Environment
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To minimize the potential risks from consumption of fish containing toxic metals including metalloids.
Term or Conditions	The Proponent shall conduct additional studies prior to and during operations as part of its freshwater and marine aquatic effects analyses to ensure that toxic trace elements concentrations anticipated to increase in the aquatic and marine environments during operation (and potentially accumulating in fish tissue) do not exceed regulatory requirements. The results of these studies should inform the Proponent's assessment of potential risks from consumption of fish, using Health Canada's hazard quotients as a descriptive tool.
Reporting Requirements:	A summary of the results of these studies and associated assessment of potential risks to human health shall be included in the Proponent's annual reports to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Potentially toxic metals in marine and freshwater environments are tracked through the AEMP. To date, there have been no Project-related exceedances of regulatory requirements (CCME guidelines). The EEM program in Roberts Bay which is currently being designed will continue to monitor metals in the marine environment and inform assessments of potential risks from consumption of fish.
TMAC Comments:	N/A
Reference:	ERM. 2020. Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report. Prepared for TMAC Resources Inc. by ERM Consultants Canada Ltd.

New Term and Condition No. 52

New Term and Condition No. 52	
Category	Accidents and Malfunctions - Spills Response and Emergency Preparedness
Responsible Parties	The Proponent, Transport Canada
Project Phase	All Phases
Objective	To ensure adequate spill response and emergency preparedness is in place to prevent fuel and chemical spills to the terrestrial and marine environment.
Term or Conditions	<p>The Proponent shall ensure that areas used to store fuel or hazardous materials include sufficient secondary containment and that all oil handling facilities have the required Oil Pollution Emergency Plan (OPEP) in place. The OPEP or other emergency response plans applicable to fuel or hazardous material storage areas are expected to include, as a minimum, the following:</p> <ul style="list-style-type: none"> a) information on the placement of spill prevention and response equipment as necessary to initiate rapid response during an emergency; b) an up to date listing of critical TMAC and government spill response contacts, and a list of authorised emergency response personnel; c) an up to date listing of emergency response training conducted by TMAC's emergency response personnel; d) easily accessible and up to date spill report forms; and e) a listing of community organizations that would be contacted to inform traditional land users of any spills or response actions implemented to ensure continued public safety. <p>The Proponent shall also demonstrate that the provisions of the OPEP or other applicable emergency response plans associated with the fuel tank farm at Roberts Bay are coordinated with the individual shipboard OPEPs required for vessels servicing the Project, and that the Shipping Management Plan addresses how response procedures between ship and shore will be coordinated.</p>
Reporting Requirements:	The Oil Pollution Emergency Response Plan (OPEP) and any other applicable emergency response plans should be provided to the Nunavut Impact Review Board (NIRB) prior to construction of the Project. Within its annual reporting to the NIRB, the Proponent shall include a discussion of any pollution incidents associated with the Project and identify any required plan updates.
Related Terms and Conditions in PC No. 003 (as amended)	Terms and Conditions No. 20 and 33
Commentary:	The term "Shipboard OPEP" has the same meaning as the term "Ship Oil Pollution Emergency Plan (SOPEP)".
Status for 2019:	Complete
TMAC Comments:	TMAC ensures that areas used for fuel and hazardous materials include sufficient secondary containment and have a comprehensive emergency response plan (see Hope Bay Project Spill Contingency Plan, March 2020). TMAC's Roberts Bay facility has a Transport Canada approved Oil Pollution Preparedness/Oil Pollution Emergency Plan (OPPP/OPEP) (TMAC 2019).
Reference:	Hope Bay Project Spill Contingency Plan (TMAC 2020b) and Oil Pollution Preparedness/Oil Pollution Emergency Plan (OPPP/OPEP) (TMAC 2019c)

New Term and Condition No. 53

New Term and Condition No. 53	
Category	Tailings Pipeline Monitoring - land-based infrastructure
Responsible Parties	The Proponent
Project Phase	All phases
Objective	To prevent potential impacts to permafrost and sensitive land features, including the freshwater environment, by maintaining the integrity of the tailings pipeline infrastructure.
Term or Conditions	<p>The Proponent shall implement a monitoring and mitigation program for the tailings pipelines that includes the following:</p> <ul style="list-style-type: none"> a) regular inspections to assess the stability of the tailings pipeline and land within the footprint of this infrastructure; b) early warning system(s) to identify a pipeline breach; c) measures to respond to and mitigate any accidental spills of tailings from the pipeline; and d) adaptive management to address unanticipated changes to land within the footprint of the tailings pipeline to ensure that the integrity of this infrastructure is maintained for the life of the Project.
Reporting Requirements:	Details regarding the monitoring and mitigation program shall be submitted to the Nunavut Impact Review Board (NIRB) prior to the installation of tailings pipeline infrastructure, with subsequent updates on the implementation of the Program submitted annually thereafter or as may otherwise be required by the NIRB for the life of the Project.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	TMAC evaluates these measures as part of the existing Doris TIA Operations, Maintenance and Surveillance Manual (TMAC 2018) which includes tailings pipeline monitoring. The manual is currently being updated in 2020 to help make the document more usable and includes details about the early warning systems to identify a pipeline breach. These include daily inspections, annual pressure testing, and monitoring of the mill control panel and pumping parameters. In addition, tailings pipeline and other land-based infrastructure are assessed annually as part of the Doris TIA Annual Geotechnical Inspection.
Reference:	Doris TIA Operations, Maintenance and Surveillance Manual - DRAFT (SRK 2020) 2019 Annual Geotechnical Inspection Tailings Impoundment Area Hope Bay Project, Hope Bay, Nunavut (SRK 2020)

New Term and Condition No. 54

New Term and Condition No. 54	
Category	Cumulative effects - activities in the Hope Bay Belt Property
Responsible Parties	The Proponent
Project Phase	All Phases
Objective	To ensure all potential cumulative effects associated with ongoing exploration and possible future phases of development are adequately and fully assessed.
Term or Conditions	The Proponent shall provide detailed updates to the Board on the status of ongoing exploration programs and other related physical activities associated with the Hope Bay Belt Property.
Reporting Requirements:	Evidence of meeting the requirements of this Term and Condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.
Commentary:	N/A
Status for 2019:	Complete
TMAC Comments:	See Section 3.2 of the 2019 NIRB Report providing an update on 2019 exploration activities and Section 4.2 on exploration work plans for 2020.
Reference:	2019 NIRB Report, Section 3.2 and 4.2.

7. Compliance with Regulatory Instruments

7.1 ANNUAL INSPECTION ACTIVITIES

In 2019 TMAC hosted regulatory inspections for CIRNAC, NIRB, KIA, and WSCC. Details of when those visits occurred and a summary of the reports and follow up from those visits are detailed in Table 7.1-1.

7.2 UNAUTHORIZED DISCHARGES AND SPILLS

During 2019, fourteen spills were reported to the Nunavut Spill Line, Water Licence Inspector and KIA Major Projects. No spills were reported to Environment and Climate Change Canada. These fourteen spills met the reporting threshold as outlined in the Nunavut Spill Contingency Planning and Reporting Regulations. In addition to the required Spill Line report, a more detailed follow-up report was filed within thirty days of each reported spill that included a description of the event together with the immediate cause, corrective and preventative action. The fourteen reportable spill events are summarized in Table 7.2-1. The follow-up spill reports detail basic causes and short/long term corrective actions.

The remaining spills that occurred during 2019 were minor in nature, occurring on land, with quick response and clean up resulting in negligible impact to the receiving environment. TMAC tracks all unauthorized discharges and spills on site, regardless if they are externally reportable or not, and identifies any observable trends. Based on those results, root cause analysis and corrective actions are recorded, tracked and implemented. Inspectors have the opportunity to review the information on demand or when at site conducting inspections.

7.3 WATER LICENCE COMPLIANCE (TYPE A 2AM-DOH1335, TYPE B 2BB-BOS1727, TYPE B 2BB-MAE1727, AND TYPE B 2BE-HOP1222)

During 2019, water management at Hope Bay Project Site was in line with the authorized Type A Water Licence for Doris and Madrid 2AM-DOH1335, the Type B Regional Exploration Licence 2BE-HOP1222, and the Type B Water Licence for Boston 2BB-BOS1727. No activities occurred under the Type A Water Licence 2AM-BOS1835 for Boston or the Type B Water Licence 2BB-MAE1727 for Madrid, therefore no water was used or waste produced from activities associated with these licences.

An overview of the sampling programs for each of the sites (Doris, Windy, Madrid and Boston) including site photographs showing the locations of monitoring sites as well as annual water sampling programs for the Hope Bay Project are provided in Appendix D the 2019 Nunavut Water Board Annual Report submitted to the NWB on March 31, 2020 and available on the NWB FTP site at <ftp://ftp.nwb-oen.ca>.

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Table 7.1-1. Summary of Annual Inspection Activities

Date	Agency	Summary	Follow up	Response
May 7-8-2019	Crown-Indigenous Relations and Northern Affairs Canada	Inspection to verify compliance with the Type A water license, 2AM-DOH1335. The inspection focus was on fuel storage, waste and water management, site infrastructure as well as drilling and mining activities. Inspection of Crown Lease 77A/3-1-2 was also conducted.	The inspector noted multiple snow piles within the Single Tank Farm at Roberts Bay. Inspector wants TMAC Resources to stop pushing snow into the berm at the Bulk Fuel Storage at the Single Tanks Farm.	TMAC would like to clarify that snow is not pushed into any of the secondary containment berms on site. Snow within the secondary containment berms are routinely consolidated into piles to be removed from the secondary containment berms in order to maintain a 110% volumetric storage capacity of the fuel tank in the event of a tank failure.
June 18-20, 2019	Kitikmeot Inuit Association	On June 18-20 the KIA inspected the Doris Commercial Lease area and infrastructure including Roberts Bay, the Jetty, Doris Site and Area, the North Dam and Tailings Impoundment Area infrastructure, and the Doris Windy All-Weather Road. Windy Camp and Boston were also toured.	Roads throughout camp show signs of wear and tear, especially areas with heavy traffic. All roads should be resurfaced to fix potholes. The Roberts Bay tank farm containment area will be adding another 5 ML tank that is currently being built. The rock face wall behind is not reinforced; this is a big safety concern. There is a lot of debris all around the crushing and milling plant that is currently being cleaned and put into C-cans. The berm is cracking at the Tank Farm in main camp, which needs to be repaired.	Roads with heavy traffic often require resurfacing after spring thaw. Road maintenance is a regularly occurring task. Spring clean-up of the site was underway during the time of the inspection. All areas identified will continue to be monitored by TMAC.
July 16-18, 2019	Worker's Safety and Compensation Commission	Inspection to verify compliance with Mines Health & Safety Regulations. The inspection focused on exploration activities, underground mining as well as surface infrastructure including the camp facility and warehouse. The inspector issued two orders for action.	Order issues.	Compliance report was submitted from TMAC within 30 days.
August 13-15, 2019	Crown-Indigenous Relations and Northern Affairs Canada	Inspection to verify compliance with water licenses 2AM-DOH1335, 2BB-BOS1727, and 2BE-HOP1222. The inspection focus was on fuel storage, waste and water management, site infrastructure as well as drilling and mining activities. Inspection of Crown Leases 77A/3-1-7 and 77A/3-3-2 were also conducted.	No follow up items identified.	N/A
August 13-15, 2019	Kitikmeot Inuit Association	On August 13-15 the KIA inspected the Doris Commercial Lease area and infrastructure including Roberts Bay, the Jetty, Doris Site and Area, the North Dam and Tailings Impoundment Area infrastructure, and the Doris Windy All-Weather Road. Windy Camp and Boston were also toured.	Roads throughout camp show signs of wear and tear, especially areas with heavy traffic. All roads should be resurfaced to fix potholes. The Roberts Bay tank farm containment area will be adding another 5 ML tank that is currently being built. The rock face wall behind is not reinforced; this is a big safety concern. The Explosive Magazine has a C-can that does not have a lock on it. Sarah and I were able to access the explosives because the C-can doesn't have a lock. This is a Very big security concern, if we were able to access the explosives without security clearance, others can as well.	The explosives magazine gate was secured immediately upon recognizing the security lock was missing. All areas identified will continue to be monitored by TMAC.
November 12-14, 2019	Crown-Indigenous Relations and Northern Affairs Canada	Inspection to verify compliance with water license 2AM-DOH1335. The inspection focus was on fuel storage, waste and water management, site infrastructure as well as drilling and mining activities. Inspection of Crown Leases 77A/3-1-7 and 77A/3-3-2 were also conducted.	During the inspection of this facility the inspector noted silt screen was still on this berm. The Inspector requested this material be removed from the Marine outfall berm to prevent the material from freezing to the surface of the berm. No further concerns were identified during the inspection.	TMAC removed the silt fence from the berm immediately.
December 10-11, 2019	Worker's Safety and Compensation Commission	Inspection to verify compliance with Mines Health & Safety Regulations. The inspection focused on exploration activities, underground mining as well as surface infrastructure including the camp facility and warehouse. The inspector issued 13 orders for action.	Order issues.	Compliance report was submitted from TMAC within 30 days.

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Table 7.2-1. Summary of Reportable Spills in 2019

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
9-Feb-19	19-048	10-Feb-18	Glycol 50-60 liters	<p>On February 9, 2019 an operator was loading ore using a 988 loader on the mill ore stockpile to transport to the mill crusher. The operator had scooped up the load and turned to begin backing up when he identified a trail of fluid originating from under the loader. The operator stopped the equipment immediately and called for assistance. Mechanics reported to the scene and found that a coolant hose line had failed allowing the radiator of the loader to drain onto the ground. A total of 50-60 L of ethylene glycol 60-40 coolant was released to the snow covered crush pad. Mechanics determined that extreme cold temperatures occurring at the time of the spill, combined with normal wear and tear of the equipment had caused the failure.</p> <p>Spill pads were placed beneath the leak to reduce the amount of spill contacting the ground surface. The loader was then taken to the mechanical shop to replace the hose line. Contaminated materials were removed from the surface of the pad (spill pads, snow and crush) and taken to the waste management facility to be stored for offsite disposal.</p> <p>The loader operator had conducted a pre-operational check of the equipment prior to beginning the task and had not noted any issues or leaks with the coolant hose lines. Preventative maintenance is conducted on this piece of equipment after every 500 operating hours and includes checks of all hose lines. Worn hose lines are replaced if integrity issues are identified. The preventative maintenance had been conducted within the recommended schedule for this equipment at the time of the spill.</p> <p>TMAC internally reviewed the incident and identified the following corrective actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Continue performing pre-operational checks on all equipment prior to use to identify potential issues prior to using the equipment; and • Continue performing preventative maintenance programs on all equipment at the recommended interval (every 500 operating hours). 	5-Mar-19
10-Mar-19	19-101	10-Mar-19	Glycol 10-20 liters	<p>At 7:30 am on March 10, 2019, the powerhouse operator identified ethylene glycol coolant on the ground beneath one of the powerhouse generator modules while conducting the daily morning inspection. Glycol was found to be leaking out of the radiator cap on the top of the cooling system. The fluid leaked onto the roof of the generator module and some of the coolant flowed over the side of the building onto the crush pad and concrete foundation below. The follow</p>	03-Apr-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>up investigation identified that failed head gaskets on two of the cylinders had caused oil to pressurize the glycol cooling system. Pressure and volume increased until glycol leaked out of the radiator cap at the top of the system.</p> <p>The generator was immediately shut down to prevent further release. Absorbent pads were used to clean glycol off the generator module to reduce the amount of spill contacting the ground surface. Contaminated materials were removed from the surface of the pad (spill pads, snow and crush) and taken to the waste management facility to be stored for offsite disposal. Clean-up efforts included hand excavation of contaminated snow from the camp pad and spill pads were used to remove fluid from side of the building and the concrete foundation. A small amount of coolant (estimated to be less than 1 L) was inaccessible to the clean-up efforts. This material was located under a sheet of stainless steel that was buried under snow and ice.</p> <p>Preventative maintenance is conducted on this generator after every 500 operating hours. The preventative maintenance had been conducted on March 4, 2019, within the recommended schedule for this equipment at the time of the spill. TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Continue performing walk around checks twice daily on all generator components to identify potential issues; and • Continue performing preventative maintenance programs on all generators at the recommended interval (every 500 operating hours). <p>Additionally, TMAC will ensure proper housekeeping around the powerhouse pad so that all foreign objects are cleared from the area once the summer thaw permits.</p>	
11-Mar-19	19-103	11-Mar-19	Tailings/Process Water 500-600 liters	<p>On March 11, 2019, while driving along the Tailings Impoundment Area (TIA) access road, the Environmental Technician identified a build-up of discoloured ice along the TIA reclaim pipeline. Mill Maintenance and Site Services personnel were notified and upon inspecting the area, determined that a leak was occurring from a flange in the reclaim pipeline used to transport reclaim water from the TIA to the Process Plant. An estimated 500-600 L of reclaim water was released to surrounding tundra. No material was released to any waterbody.</p> <p>Upon investigation, it was determined that the bolts on a flange connecting two sections of pipe together had become loose. This allowed the two sections of pipe to separate slightly causing the release.</p>	3-Apr-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>The Environmental Supervisor, Mill Maintenance and Site Services personnel were immediately notified. Snow and ice covering the line was removed to expose the pipe and flange. The loose bolts on the flange were tightened stopping the leak.</p> <p>A sample of the reclaim water was collected at the time of the release and was below the discharge criteria outlined in Schedule 4 of the Metal and Diamond Mining Effluent Regulations. As the sample results met this criteria, no additional efforts were made to excavate frozen reclaim water from the surface of the tundra. Excavation would result in damage to tundra and introduce a risk of future permafrost degradation in the area. Contaminated snow and ice that was hand excavated to expose the reclaim pipeline was disposed of in the Tailings Impoundment Area.</p> <p>TMAC internally reviewed the incident and identified the following corrective actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Implement routine preventative maintenance program for reclaim water pipeline, including checks of flange bolts and pipe connections; and • Place delineators at flange locations along reclaim pipeline in summer of 2019 to identify flange locations during winter months and allow effective snow removal at these locations to facilitate inspections. 	
26-Mar-19	19-132	26-Mar-19	Glycol 50 liters	<p>At 6:30 am on March 26, 2019, the powerhouse operator responded to an alarm within the powerhouse. It was discovered that generator #5 engine had experienced a catastrophic failure and released oil and glycol on to the deck of the generator module. The ethylene glycol coolant was dripping from the deck of the module and onto the crush pad and concrete foundation below the module.</p> <p>Absorbent pads were used to contain and absorb the dripping and pooling glycol underneath the module. Contaminated materials were removed from the surface of the pad (spill pads, snow and crush) and taken to the waste management facility to be stored for offsite disposal. Preventative maintenance is conducted on this generator after every 500 operating hours. The preventative maintenance had been conducted on March 5, 2019, and the unit was within the recommended schedule at the time of the spill.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Continue performing walk around checks twice daily on all generator components to identify potential issues; 	19-Apr-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<ul style="list-style-type: none"> Continue performing preventative maintenance programs on all generators at the recommended interval (every 500 operating hours); Prior to placement of a replacement generator, the floor of the module will be inspected and any holes caused by the incident will be repaired; and A solution to seal the seams of each generator module enclosure is being investigated in order to contain any spills inside the module from reaching the crush pad and concrete foundation. 	
21-Apr-19	19-165	22-Apr-19	Cement 375 kilograms	<p>On April 21, 2019, an employee was attempting to remove a mega-bag of cement mix out of a C-can with the telehandler. While removing the mega-bag, it caught a sharp edge on the inside of the C-can. As a result, approximately 375 kg of the mega-bag spilled onto the ground in front of the C-can. The majority of the contents remained contained within the mega-bag.</p> <p>The cement bag was placed into another C-can while the hole was being repaired and the area being was cleared. Contaminated snow was removed with shovels and a Bobcat, placed into another mega-bag, and taken to the Tailings Storage Facility for disposal.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> A spotter must be used for accessing and replacing material in C-cans; Spotter and operator will properly assess challenges of area prior to making pick. During this time, they will also discuss the signal language to be used that will allow them to best support the move. 	21-May-19
26-Apr-19	19-177	26-Apr-19	Glycol 950 liters	<p>On April 26, 2019, an employee was attempting to remove a plastic tote of ethylene glycol 60-40 coolant from a C-can with a telehandler. While loading the tote, the forks of the telehandler shifted and punctured the tote. Approximately 950 L of coolant was released into the C-can and onto the camp pad in front of the C-can doors. In the investigation of this incident, it was found that a spotter was not used. A spotter may have been able to identify a shift in the telehandler forks before a puncture, and assist with any potential issues that may arise when moving material.</p> <p>The operator immediately reported the spill to the supervisor, who contacted the Environmental department. Spill pads were placed to absorb spilled coolant. Contaminated snow was removed by hand and with equipment. This included material that migrated beneath the C-cans. To do so, the C-cans were moved and the contaminated material was excavated from the camp pad</p>	22-May-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>surface. Contaminated material was placed into drums and taken to the waste management facility to be stored for offsite disposal.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • A spotter must be used for accessing and replacing material in C-cans; • Spotter and operator will agree on a signal language to be used during pick; • Spotter and operator will assess the material and the location for potential challenges associated with the pick. Challenges will be properly mitigated; and • The procedure for the unloading of totes will be thoroughly reviewed and gone over with the team members. 	
10-May-19	19-200	11-May-19	Glycol 15 liters	<p>On May 10, 2019, an employee was clearing snow from a laydown area at the Roberts Bay Waste Management facility when a leak of ethylene glycol coolant was identified. The leak was traced to a C-can container located on the third level of a stack of C-cans used to store waste materials. The C-can was brought down for an immediate inspection. An overturned lined mega-bag of clean plastic was identified as the source of the leak. It was found that a 20 L pail of waste ethylene glycol coolant had been mixed in with the clean plastic waste. The coolant had drained from the pail onto the floor of the C-can, leached under the doors and ran down the C-can stack. Approximately 10-15 L spilled to the camp pad.</p> <p>The C-can container was brought down from the stack, opened and cleaned. C-cans stacked below were also removed. Contaminated snow and crush was removed from the camp pad surface with a skid-steer loader and placed into drums for disposal.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Thoroughly inspect materials being brought to Waste Management, and log violations for follow-up. • Ensure that mega-bags are placed into C-cans upright and secure, to reduce movement during handling of C-cans. 	02-Jun-19
15-Jun-19	19-240	15-Jun-19	Turbid Water Unknown Volume	<p>On June 15, 2019, while stripping a surface layer of overburden for the development of the Naartok East - Crown Pillar Recovery Trench at Madrid North, surface runoff containing sediment within the footprint of the stripping area migrated overland through the active layer of tundra to the shoreline of</p>	15-Jul-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>Patch Lake. This release was noted during a daily construction inspection, at approximately 17:15. The runoff bypassed sediment control installations and entered Patch Lake approximately 100m downstream from the disturbed area. Two separate overland flows, exhibiting visible turbidity, were observed flowing towards and to the shoreline of Patch Lake. The ice had not yet fully melted along the shoreline of the lake, and the sediment was confined to a pool above the ice between the two overland flows.</p> <p>An incident investigation was conducted soon after the incident to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> • Failure of sediment controls installed between stripping footprint and Patch Lake due to uncertainty of site drainage locations prior to work and under estimation of the volume and rate of water that would be released from the area; and • Failure to select the appropriate sedimentation control measures for the specific terrain and conditions. <p>On June 16, two turbidity curtains were installed in areas where sediment was observed on the shoreline of Patch Lake. The installation of these curtains ensured that sediment was contained close to the shore, minimizing the potential migration into Patch Lake after the lake ice had melted. This additional measure was observed to be effective in containing much of the sediment between the curtain and the shore. On June 17, a newly constructed rock berm was initiated around the perimeter of the stripping area to divert water around the work area and to keep water contained within the footprint prior to resuming stripping activities to reduce the likelihood of a reoccurrence. In addition to the corrective actions, water samples were collected for acute lethality testing and water quality characterization.</p> <p>The incident investigation concluded with the following preventative actions for future overburden stripping in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Assessment of sedimentation installations prior to commencing overburden stripping activities; • Additional training for personnel on sedimentation control installations; • Conduct thorough assessment of drainage locations (based on historic photos if necessary) to identify flow paths and areas of risk; • Preinstall turbidity curtains where practical; and • Installation of rock berms in high-risk areas prior to stripping of overburden. 	

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>Representative samples of both flows were collected at the shore where turbidity was observed to be entering Patch Lake. The samples were collected approximately four hours after the event was initially observed, and for two subsequent days after. This was done to quantify the impact of the mitigation measures and potential impacts to Patch Lake. Representative samples were also collected on the day the release was observed for acute lethality testing. A review of the analytical results showed both streams entering Patch Lake to be non-acutely lethal with a 100% survival rate for both Rainbow trout (96-hour LC50 test) and Daphnia magna (48-hour LC50 test).</p> <p>Water quality results were compared to the Metal and Diamond Mining Effluent Regulations (MDMER) Schedule 4 - Authorized Limits of Deleterious Substances. All parameters were below both the Maximum Authorized Monthly Mean Concentration and the Maximum Authorized Concentration in a Grab Sample with the exception of Total Suspended Solids (TSS). TSS results for NE-C were 93.7, 17.1, and 4.3 mg/L on June 15, 16, and 17 respectively. TSS results for NE-D were 29.3, 8.9, and 3.5 mg/L on June 15, 16, and 17 respectively. Water quality results and photos of the location were appended to the 30-day follow-up report.</p>	
23-Jun-19	19-252	24-Jun-19	Sewage 100 liters	<p>On June 23, 2019, while conducting an inspection of the camp lift station and pipeline facilities at the Boston Camp, an employee identified that the pipe support of the main kitchen grey water line to the camp lift station had failed resulting in the pipe dropping approximately 1ft. While the grey water line was being repaired, two sections of the pipeline separated resulting in approximately 100 L of grey water being released to the tundra below. Upon investigation, it was found that a 2" HDPE pipeline had been glued to an ABS pipeline. The additional strain resulting from the pipeline dropping caused the glue to separate at this location. The pipe support was also found to be weathered and no longer adequate to support the weight of the pipe.</p> <p>The pipeline was temporarily shored with new wood materials to realign the pipeline and release strain from the connection. The pipe support materials along the length of this pipeline will be replaced once the area can be accessed by equipment with minimal risk of damage to the tundra. The pipe sections were reconnected and insulated; a Victaulic clamp appropriate for the pipeline materials (HDPE to ABS connection) has been ordered and was installed at this location to reduce the risk of a reoccurrence.</p> <p>Grey water released from the pipeline had soaked into the tundra and could not be recovered. Post-incident water quality sampling was conducted at the</p>	23-Jul-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>shoreline of Aimaokatalok Lake located approximately 80 m downstream of the spill location and compared to a sample collected on June 17, 2019 (BOS-1) prior to the incident. Results of this sampling were provided in the 30-day follow-up report.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Use Victaulic fittings for pipe connections that are appropriate for the pipe material; • Conduct assessment of pipe connections along entire length of the grey water pipeline at Boston Camp and replace if necessary; and • Replace current pipe support with robust materials that are less susceptible to weathering and failure. 	
28-Jul-19	19-301	28-Jul-19	Sewage 7 cubic metres	<p>On July 28, 2019, a sewage spill was discovered at the north-west corner of the Boston Camp complex. Sewage and grey water from the north section of the camp was released to the camp pad beneath the building and onto the tundra north-west of the building. This section of the camp had been opened on July 20 and was occupied between July 20 and 28 when the spill was discovered. An estimated 7,000 L of sewage/grey water was released during this time. Upon investigation, it was discovered that a Fernco fitting on the main sewage line had disconnected at some point prior to occupying this section of the camp. It is believed that this fitting had been installed incorrectly and that freeze/thaw conditions over time contributed to the failure. It was also identified that the cribbing under this pipeline is in poor condition and may have contributed to the failure of the fitting. Due to snow drifts around the buildings when Boston Camp was opened in June 2019, this section of the camp was not accessible to conduct an inspection of this infrastructure and a miscommunication between cross-shifts resulted in pre-use inspections of this infrastructure to be overlooked prior to occupying this section of the camp in July 2019.</p> <p>A small pump was used to recover pooled material under the building and on the tundra into plastic totes for treatment in the Sewage Treatment Plant and lime was placed on the crush pad beneath the building to neutralize odours and bacteria. The failed Fernco fitting was replaced to reconnect the pipes and prevent further release of materials. To reduce the risk of failure resulting from freeze/thaw conditions, an expansion joint was ordered and installed on the pipe to replace the Fernco fitting.</p>	22-Aug-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Conduct pre-operational inspections of all sewage and greywater infrastructure during camp commissioning prior to occupying camp, including testing of all infrastructure with fresh water to identify leaks, and document these inspections; • Conduct daily operational inspections of all sewage and greywater infrastructure while camp is occupied and document these inspections; • Use of expansion joint fittings for pipe connections where appropriate to reduce risk of failure due to freeze/thaw conditions; • Conduct full assessment of all connections of sewage and grey water pipelines at Boston Camp and replace as necessary; and • Conduct full assessment of support and cribbing infrastructure for all pipelines at Boston Camp and replace as necessary. 	
29-Oct-19	19-445	29-Oct-19	Treated Effluent 1 cubic metre	<p>On October 29, 2019, an operator was completing commissioning work in a water treatment facility at the Doris camp. During this work, the operator inadvertently caused damage to a PVC valve on the treated effluent line. Treated effluent from the damaged valve spilled out of the door and onto the crushed aggregate pad the facility sits on. This is an unauthorized discharge point.</p> <p>An incident investigation was conducted soon after the incident occurred to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> • Unsupported and un-guarded PVC drain valves located 1" above floor; • Flaw in design of spill containment capacity of building. <p>Although the mine site was not currently discharging the effluent being treated into to the environment, commissioning of the water treatment facility was on-going and samples of the treated effluent were collected at a regular basis to evaluate treatment performance. Based on samples taken at the time of the spill, results were below the Maximum Authorized Monthly Mean Concentration for a deleterious substance as outlined in Schedule 4 of the MDMER. Analytical results for the released effluent were provided in the 30-day follow-up report.</p> <p>The operator immediately isolated the line to prevent further spillage. Contaminated snow, ice, and crush was excavated and removed for disposal in the Tailings Impoundment Area. In order to reduce the likelihood of a reoccurrence,</p>	19-Nov-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>the incident investigation concluded with the following preventative actions for future work at this water treatment facility:</p> <ul style="list-style-type: none"> • Sump and sump pump will be relocated to more adequately capture any released effluent; • Sump pump line will be insulated and/or heat traced to prevent freezing in winter months; and • Supports or protective guards will be placed on all PVC drain valves located on or near floor level. 	
30-Oct-19	19-448	30-Oct-19	Untreated Mine Effluent 12 cubic metres	<p>At the time of the spill event, TMAC was in the process of commissioning components of the Roberts Bay Discharge System (RBDS). The RBDS is designed to transport a single compliant effluent stream consisting of effluent from the Tailings Impoundment Area (TIA) and the underground mine workings. Underground workings at the Doris-Madrid Project are dewatered to allow for continued mining activities. In this process, effluent is pumped from an underground sump to a tank in a water treatment pump house (Tank-001). Prior to the incident, a sump pump underground was replaced, resulting in an increase in effluent reporting to Tank-001 than previously observed. This additional effluent, and increased flow, exceeded the capacity of the pump that conveys effluent from Tank-001 to the TIA. Due to this exceedance in pumping capacity, the effluent level in Tank-001 increased above its holding capacity, and effluent began to flow through an overflow pipe on the tank to a sump on the facility floor. Concurrently to the overflow of Tank-001, an electrical fault caused the pump for the sump receiving the overflow to fail, and as a result, untreated mine effluent overflowed the floor sump and eventually over the doorsills and spilled onto the crushed aggregate pad outside of the pump house.</p> <p>An incident investigation was conducted soon after the incident occurred to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> • Inadequate communication between work groups; • Failure to monitor the pump house building continually during commissioning; • Undersized breaker for sump pump was not identified during dry-commissioning; and • Inadequate warning systems in place prior to wet-commissioning. 	25-Nov-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>Upon discovery, the underground effluent pumping was ceased, stopping the active spill. Contaminated snow, ice, and crush was excavated and removed for disposal in the TIA. A larger capacity electrical breaker was also installed to ensure that this particular pump functions as required.</p> <p>In order to reduce the likelihood of a reoccurrence, the incident investigation concluded with the following preventative actions for future work between these work groups, and for future work in the pump house facility:</p> <ul style="list-style-type: none"> • When conditions change underground, or when pumping activities are altered, notifications will be provided to Mill personnel; • Continual physical monitoring of the pump house facility will occur until cameras and automatic controls are installed in the Mill Control Room; and • A high-level alarm for Tank-001 has been installed to notify the control Mill Control Room in advance of a potential overflow situation. 	
5-Nov-19	19-453	5-Nov-19	Untreated Mine Effluent 45 cubic metres	<p>TMAC is in the process of commissioning components of the Roberts Bay Discharge System (RBDS). The RBDS is designed to transport a single compliant effluent stream consisting of effluent from the Tailings Impoundment Area (TIA) and the underground mine workings. Underground workings at the Doris-Madrid Project are dewatered to allow for continued mining activities. In this process, effluent is pumped intermittently from an underground sump to a tank (Tank-001) located in a water treatment pump house. Tank-001 is drained by Pump-001.</p> <p>At the time of the incident (approx. 02:10am), Pump-001 had shut down as no water was being pumped from the underground workings and the level of Tank 001 was low. When pumping from underground recommenced and filled Tank 001, Pump-001 failed to restart. Effluent began to overflow from Tank-001 onto the floor which activated the sump pump. A high level alarm for Tank-001 had been installed to notify the Mill Control Room in advance of a potential overflow situation, however this alarm failed to initiate during this event. The sump pump directed the effluent into an alternate storage tank in the water treatment pump house (Tank-140). As a result of the heightened load, the level in Tank-140 also increased beyond capacity and effluent began to overflow from this tank onto the floor of the facility. Effluent seeped into the Motor Control Centre (MCC) room and triggered an electrical fault, causing power in the facility to be lost. No alarm was activated when the facility lost power, and the status of the building was not discovered until the next control room rounds at 06:00am. Untreated mine effluent overtopped the doorsills of the building and spilled onto</p>	05-Dec-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>the crush aggregate pad outside the pumphouse. Effluent froze to the surface of the camp pad and no effluent was released to the surrounding environment.</p> <p>An incident investigation was conducted soon after the incident occurred to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> • Inadequate communications between hardware, software and process when the high level alarm failed to communicate to the Mill control room of the potential overflow situation when Pump-001 did not restart; • Inadequate warning systems as no alarm was in place to alert the Mill control room that power was lost in the facility (loss of communications alarm); and • Inadequate barriers in place to prevent water from entering MCC room. <p>The following corrective/preventative actions were identified to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Review of control programming and field verification of all alarms. Ensure new alarms are tested prior to recommencing operations; • New alarm will be installed to notify the Mill Control Room if a loss of communications/power has occurred within the facility; • Construct concrete berm at the MCC doorway; • Install an emergency drainage pipe system from the pump house building to the Sedimentation Control Pond to manage overflow in the event the sump pump system is overwhelmed within the facility. 	
18-Nov-19	19-465	18-Nov-19	Sewage 100 liters	<p>While performing daily inspections, the Sewage Treatment Plant operator identified that the main lift station in Doris Camp had begun to overflow. An estimated 100 L of untreated sewage was released to the gravel floor inside the lift station building. No material was released to the camp pad surrounding the building. At the time of the incident, maintenance was being performed in this section of the camp and a planned power shut down of this area had been conducted. Power to the main lift station had been cut to allow this maintenance to proceed resulting in shutdown of the pump from the main lift station to the Sewage Treatment Plant. Secondary lift stations from other sections of the camp continued to feed into the main camp lift station sump resulting in the overflow.</p> <p>An incident investigation was conducted soon after the incident occurred to determine the root cause. The investigation concluded with the following root causes:</p>	11-Dec-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<ul style="list-style-type: none"> • Failure to identify risk of overflow within the system when initiating the power shutdown; and • Inadequate procedures related to shutdown of facilities in this section of the camp which would identify the need to provide backup power to the main lift station pump. <p>Upon discovery, a vacuum truck was used to remove material from within the lift station for transfer to the Sewage Treatment Plant to prevent further overflow until the maintenance was completed and power was restored. Contaminated crush was hand excavated from around the lift station sump and lime was placed on the impacted area to prevent the development of odors or pathogens.</p> <p>The following corrective/preventative actions were identified to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Improved task planning to be completed by Supervisor prior to initiating planned electrical shutdowns; and • Identify all infrastructure affected during planned maintenance, the potential risks to that infrastructure and develop mitigation measures to minimize those risks prior to starting a task. 	
9-Feb-19	19-048	10-Feb-18	Glycol 50-60 liters	<p>On February 9, 2019 an operator was loading ore using a 988 loader on the mill ore stockpile to transport to the mill crusher. The operator had scooped up the load and turned to begin backing up when he identified a trail of fluid originating from under the loader. The operator stopped the equipment immediately and called for assistance. Mechanics reported to the scene and found that a coolant hose line had failed allowing the radiator of the loader to drain onto the ground. A total of 50-60L of ethylene glycol 60-40 coolant was released to the snow covered crush pad. Mechanics determined that extreme cold temperatures occurring at the time of the spill, combined with normal wear and tear of the equipment had caused the failure.</p> <p>Spill pads were placed beneath the leak to reduce the amount of spill contacting the ground surface. The loader was then taken to the mechanical shop to replace the hose line. Contaminated materials were removed from the surface of the pad (spill pads, snow and crush) and taken to the waste management facility to be stored for offsite disposal.</p> <p>The loader operator had conducted a pre-operational check of the equipment prior to beginning the task and had not noted any issues or leaks with the coolant hose lines. Preventative maintenance is conducted on this piece of</p>	5-Mar-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>equipment after every 500 operating hours and includes checks of all hose lines. Worn hose lines are replaced if integrity issues are identified. The preventative maintenance had been conducted within the recommended schedule for this equipment at the time of the spill.</p> <p>TMAC internally reviewed the incident and identified the following corrective actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Continue performing pre-operational checks on all equipment prior to use to identify potential issues prior to using the equipment; and • Continue performing preventative maintenance programs on all equipment at the recommended interval (every 500 operating hours). 	
10-Mar-19	19-101	10-Mar-19	Glycol 10-20 liters	<p>At 7:30 am on March 10, 2019, the powerhouse operator identified ethylene glycol coolant on the ground beneath one of the powerhouse generator modules while conducting the daily morning inspection. Glycol was found to be leaking out of the radiator cap on the top of the cooling system. The fluid leaked onto the roof of the generator module and some of the coolant flowed over the side of the building onto the crush pad and concrete foundation below. The follow up investigation identified that failed head gaskets on two of the cylinders had caused oil to pressurize the glycol cooling system. Pressure and volume increased until glycol leaked out of the radiator cap at the top of the system.</p> <p>The generator was immediately shut down to prevent further release. Absorbent pads were used to clean glycol off the generator module to reduce the amount of spill contacting the ground surface. Contaminated materials were removed from the surface of the pad (spill pads, snow and crush) and taken to the waste management facility to be stored for offsite disposal. Clean-up efforts included hand excavation of contaminated snow from the camp pad and spill pads were used to remove fluid from side of the building and the concrete foundation. A small amount of coolant (estimated to be less than 1 L) was inaccessible to the clean-up efforts. This material was located under a sheet of stainless steel that was buried under snow and ice.</p> <p>Preventative maintenance is conducted on this generator after every 500 operating hours. The preventative maintenance had been conducted on March 4, 2019, within the recommended schedule for this equipment at the time of the spill. TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Continue performing walk around checks twice daily on all generator components to identify potential issues; and 	03-Apr-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<ul style="list-style-type: none"> Continue performing preventative maintenance programs on all generators at the recommended interval (every 500 operating hours). <p>Additionally, TMAC will ensure proper housekeeping around the powerhouse pad so that all foreign objects are cleared from the area once the summer thaw permits.</p>	
11-Mar-19	19-103	11-Mar-19	Tailings/Process Water 500-600 liters	<p>On March 11, 2019, while driving along the TIA access road, the Environmental Technician identified a build-up of discoloured ice along the TIA reclaim pipeline. Mill Maintenance and Site Services personnel were notified and upon inspecting the area, determined that a leak was occurring from a flange in the reclaim pipeline used to transport reclaim water from the TIA to the Process Plant. An estimated 500-600 L of reclaim water was released to surrounding tundra. No material was released to any waterbody.</p> <p>Upon investigation, it was determined that the bolts on a flange connecting two sections of pipe together had become loose. This allowed the two sections of pipe to separate slightly causing the release.</p> <p>The Environmental Supervisor, Mill Maintenance and Site Services personnel were immediately notified. Snow and ice covering the line was removed to expose the pipe and flange. The loose bolts on the flange were tightened stopping the leak.</p> <p>A sample of the reclaim water was collected at the time of the release and was below the discharge criteria outlined in Schedule 4 of the Metal and Diamond Mining Effluent Regulations. As the sample results met this criteria, no additional efforts were made to excavate frozen reclaim water from the surface of the tundra. Excavation would result in damage to tundra and introduce a risk of future permafrost degradation in the area. Contaminated snow and ice that was hand excavated to expose the reclaim pipeline was disposed of in the Tailings Impoundment Area.</p> <p>TMAC internally reviewed the incident and identified the following corrective actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> Implement routine preventative maintenance program for reclaim water pipeline, including checks of flange bolts and pipe connections; and Place delineators at flange locations along reclaim pipeline in summer of 2019 to identify flange locations during winter months and allow effective snow removal at these locations to facilitate inspections. 	3-Apr-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
26-Mar-19	19-132	26-Mar-19	Glycol 50 liters	<p>At 6:30 am on March 26, 2019, the powerhouse operator responded to an alarm within the powerhouse. It was discovered that generator #5 engine had experienced a catastrophic failure and released oil and glycol on to the deck of the generator module. The ethylene glycol coolant was dripping from the deck of the module and onto the crush pad and concrete foundation below the module.</p> <p>Absorbent pads were used to contain and absorb the dripping and pooling glycol underneath the module. Contaminated materials were removed from the surface of the pad (spill pads, snow and crush) and taken to the waste management facility to be stored for offsite disposal. Preventative maintenance is conducted on this generator after every 500 operating hours. The preventative maintenance had been conducted on March 5, 2019, and the unit was within the recommended schedule at the time of the spill.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Continue performing walk around checks twice daily on all generator components to identify potential issues; • Continue performing preventative maintenance programs on all generators at the recommended interval (every 500 operating hours); • Prior to placement of a replacement generator, the floor of the module will be inspected and any holes caused by the incident will be repaired; and • A solution to seal the seams of each generator module enclosure is being investigated in order to contain any spills inside the module from reaching the crush pad and concrete foundation. 	19-Apr-19
21-Apr-19	19-165	22-Apr-19	Cement 375 kilograms	<p>On April 21, 2019, an employee was attempting to remove a mega-bag of cement mix out of a C-can with the telehandler. While removing the mega-bag, it caught a sharp edge on the inside of the C-can. As a result, approximately 375 kg of the mega-bag spilled onto the ground in front of the C-can. The majority of the contents remained contained within the mega-bag.</p> <p>The cement bag was placed into another C-can while the hole was being repaired and the area being was cleared. Contaminated snow was removed with shovels and a Bobcat, placed into another mega-bag, and taken to the Tailings Storage Facility for disposal.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p>	21-May-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<ul style="list-style-type: none"> • A spotter must be used for accessing and replacing material in C-cans; • Spotter and operator will properly assess challenges of area prior to making pick. During this time, they will also discuss the signal language to be used that will allow them to best support the move. 	
26-Apr-19	19-177	26-Apr-19	Glycol 950 liters	<p>On April 26, 2019, an employee was attempting to remove a plastic tote of ethylene glycol 60-40 coolant from a C-can with a telehandler. While loading the tote, the forks of the telehandler shifted and punctured the tote. Approximately 950 L of coolant was released into the C-can and onto the camp pad in front of the C-can doors. In the investigation of this incident, it was found that a spotter was not used. A spotter may have been able to identify a shift in the telehandler forks before a puncture, and assist with any potential issues that may arise when moving material.</p> <p>The operator immediately reported the spill to the supervisor, who contacted the Environmental department. Spill pads were placed to absorb spilled coolant. Contaminated snow was removed by hand and with equipment. This included material that migrated beneath the C-cans. To do so, the C-cans were moved and the contaminated material was excavated from the camp pad surface. Contaminated material was placed into drums and taken to the waste management facility to be stored for offsite disposal.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • A spotter must be used for accessing and replacing material in C-cans; • Spotter and operator will agree on a signal language to be used during pick; • Spotter and operator will assess the material and the location for potential challenges associated with the pick. Challenges will be properly mitigated; and • The procedure for the unloading of totes will be thoroughly reviewed and gone over with the team members. 	22-May-19
10-May-19	19-200	11-May-19	Glycol 15 liters	<p>On May 10, 2019, an employee was clearing snow from a laydown area at the Roberts Bay Waste Management facility when a leak of ethylene glycol coolant was identified. The leak was traced to a C-can container located on the third level of a stack of C-cans used to store waste materials. The C-can was brought down for an immediate inspection. An overturned lined mega-bag of clean plastic was identified as the source of the leak. It was found that a 20 L pail of waste ethylene glycol coolant had been mixed in with the clean plastic waste. The coolant had drained from the pail onto the floor of the C-can, leached</p>	02-Jun-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>under the doors and ran down the C-can stack. Approximately 10-15 L spilled to the camp pad.</p> <p>The C-can container was brought down from the stack, opened and cleaned. C-cans stacked below were also removed. Contaminated snow and crush was removed from the camp pad surface with a skid-steer loader and placed into drums for disposal.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Thoroughly inspect materials being brought to Waste Management, and log violations for follow-up. • Ensure that mega-bags are placed into C-cans upright and secure, to reduce movement during handling of C-cans. 	
15-Jun-19	19-240	15-Jun-19	Turbid Water Unknown Volume	<p>On June 15, 2019, while stripping a surface layer of overburden for the development of the Naartok East - Crown Pillar Recovery Trench at Madrid North, surface runoff containing sediment within the footprint of the stripping area migrated overland through the active layer of tundra to the shoreline of Patch Lake. This release was noted during a daily construction inspection, at approximately 17:15. The runoff bypassed sediment control installations and entered Patch Lake approximately 100m downstream from the disturbed area. Two separate overland flows, exhibiting visible turbidity, were observed flowing towards and to the shoreline of Patch Lake. The ice had not yet fully melted along the shoreline of the lake, and the sediment was confined to a pool above the ice between the two overland flows.</p> <p>An incident investigation was conducted soon after the incident to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> • Failure of sediment controls installed between stripping footprint and Patch Lake due to uncertainty of site drainage locations prior to work and under estimation of the volume and rate of water that would be released from the area; and • Failure to select the appropriate sedimentation control measures for the specific terrain and conditions. <p>On June 16, two turbidity curtains were installed in areas where sediment was observed on the shoreline of Patch Lake. The installation of these curtains ensured that sediment was contained close to the shore, minimizing the potential migration into Patch Lake after the lake ice had melted. This additional measure</p>	15-Jul-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>was observed to be effective in containing much of the sediment between the curtain and the shore. On June 17, a newly constructed rock berm was initiated around the perimeter of the stripping area to divert water around the work area and to keep water contained within the footprint prior to resuming stripping activities to reduce the likelihood of a reoccurrence. In addition to the corrective actions, water samples were collected for acute lethality testing and water quality characterization.</p> <p>The incident investigation concluded with the following preventative actions for future overburden stripping in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Assessment of sedimentation installations prior to commencing overburden stripping activities; • Additional training for personnel on sedimentation control installations; • Conduct thorough assessment of drainage locations (based on historic photos if necessary) to identify flow paths and areas of risk; • Preinstall turbidity curtains where practical; and • Installation of rock berms in high-risk areas prior to stripping of overburden. <p>Representative samples of both flows were collected at the shore where turbidity was observed to be entering Patch Lake. The samples were collected approximately four hours after the event was initially observed, and for two subsequent days after. This was done to quantify the impact of the mitigation measures and potential impacts to Patch Lake. Representative samples were also collected on the day the release was observed for acute lethality testing. A review of the analytical results showed both streams entering Patch Lake to be non-acutely lethal with a 100% survival rate for both Rainbow trout (96-hour LC50 test) and Daphnia magna (48-hour LC50 test).</p> <p>Water quality results were compared to the MDMER Schedule 4 - Authorized Limits of Deleterious Substances. All parameters were below both the Maximum Authorized Monthly Mean Concentration and the Maximum Authorized Concentration in a Grab Sample with the exception of Total Suspended Solids (TSS). TSS results for NE-C were 93.7, 17.1, and 4.3 mg/L on June 15, 16, and 17 respectively. TSS results for NE-D were 29.3, 8.9, and 3.5 mg/L on June 15, 16, and 17 respectively. Water quality results and photos of the location were appended to the 30-day follow-up report.</p>	

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
23-Jun-19	19-252	24-Jun-19	Sewage 100 liters	<p>On June 23, 2019, while conducting an inspection of the camp lift station and pipeline facilities at the Boston Camp, an employee identified that the pipe support of the main kitchen grey water line to the camp lift station had failed resulting in the pipe dropping approximately 1 ft. While the grey water line was being repaired, two sections of the pipeline separated resulting in approximately 100 L of grey water being released to the tundra below. Upon investigation, it was found that a 2" HDPE pipeline had been glued to an ABS pipeline. The additional strain resulting from the pipeline dropping caused the glue to separate at this location. The pipe support was also found to be weathered and no longer adequate to support the weight of the pipe.</p> <p>The pipeline was temporarily shored with new wood materials to realign the pipeline and release strain from the connection. The pipe support materials along the length of this pipeline will be replaced once the area can be accessed by equipment with minimal risk of damage to the tundra. The pipe sections were reconnected and insulated; a Victaulic clamp appropriate for the pipeline materials (HDPE to ABS connection) has been ordered and was installed at this location to reduce the risk of a reoccurrence.</p> <p>Grey water released from the pipeline had soaked into the tundra and could not be recovered. Post-incident water quality sampling was conducted at the shoreline of Aimaakatalok Lake located approximately 80 m downstream of the spill location and compared to a sample collected on June 17, 2019 (BOS-1) prior to the incident. Results of this sampling were provided in the 30-day follow-up report.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Use Victaulic fittings for pipe connections that are appropriate for the pipe material; • Conduct assessment of pipe connections along entire length of the grey water pipeline at Boston Camp and replace if necessary; and • Replace current pipe support with robust materials that are less susceptible to weathering and failure. 	23-Jul-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
28-Jul-19	19-301	28-Jul-19	Sewage 7 cubic metres	<p>On July 28, 2019, a sewage spill was discovered at the north-west corner of the Boston Camp complex. Sewage and grey water from the north section of the camp was released to the camp pad beneath the building and onto the tundra north-west of the building. This section of the camp had been opened on July 20 and was occupied between July 20 and 28 when the spill was discovered. An estimated 7,000 L of sewage/grey water was released during this time. Upon investigation, it was discovered that a Fernco fitting on the main sewage line had disconnected at some point prior to occupying this section of the camp. It is believed that this fitting had been installed incorrectly and that freeze/thaw conditions over time contributed to the failure. It was also identified that the cribbing under this pipeline is in poor condition and may have contributed to the failure of the fitting. Due to snow drifts around the buildings when Boston Camp was opened in June 2019, this section of the camp was not accessible to conduct an inspection of this infrastructure and a miscommunication between cross-shifts resulted in pre-use inspections of this infrastructure to be overlooked prior to occupying this section of the camp in July 2019.</p> <p>A small pump was used to recover pooled material under the building and on the tundra into plastic totes for treatment in the Sewage Treatment Plant and lime was placed on the crush pad beneath the building to neutralize odours and bacteria. The failed Fernco fitting was replaced to reconnect the pipes and prevent further release of materials. To reduce the risk of failure resulting from freeze/thaw conditions, an expansion joint was ordered and installed on the pipe to replace the Fernco fitting.</p> <p>TMAC internally reviewed the incident and identified the following preventative actions in order to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Conduct pre-operational inspections of all sewage and greywater infrastructure during camp commissioning prior to occupying camp, including testing of all infrastructure with fresh water to identify leaks, and document these inspections; • Conduct daily operational inspections of all sewage and greywater infrastructure while camp is occupied and document these inspections; • Use of expansion joint fittings for pipe connections where appropriate to reduce risk of failure due to freeze/thaw conditions; • Conduct full assessment of all connections of sewage and grey water pipelines at Boston Camp and replace as necessary; and • Conduct full assessment of support and cribbing infrastructure for all pipelines at Boston Camp and replace as necessary. 	22-Aug-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
29-Oct-19	19-445	29-Oct-19	Treated Effluent 1 cubic metre	<p>On October 29, 2019, an operator was completing commissioning work in a water treatment facility at the Doris camp. During this work, the operator inadvertently caused damage to a PVC valve on the treated effluent line. Treated effluent from the damaged valve spilled out of the door and onto the crushed aggregate pad the facility sits on. This is an unauthorized discharge point.</p> <p>An incident investigation was conducted soon after the incident occurred to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> • Unsupported and un-guarded PVC drain valves located 1" above floor; • Flaw in design of spill containment capacity of building. <p>Although the mine site was not currently discharging the effluent being treated into to the environment, commissioning of the water treatment facility was on-going and samples of the treated effluent were collected at a regular basis to evaluate treatment performance. Based on samples taken at the time of the spill, results were below the Maximum Authorized Monthly Mean Concentration for a deleterious substance as outlined in Schedule 4 of the MDMER. Analytical results for the released effluent were provided in the 30-day follow-up report.</p> <p>The operator immediately isolated the line to prevent further spillage. Contaminated snow, ice, and crush was excavated and removed for disposal in the Tailings Impoundment Area. In order to reduce the likelihood of a reoccurrence, the incident investigation concluded with the following preventative actions for future work at this water treatment facility:</p> <ul style="list-style-type: none"> • Sump and sump pump will be relocated to more adequately capture any released effluent; • Sump pump line will be insulated and/or heat traced to prevent freezing in winter months; and • Supports or protective guards will be placed on all PVC drain valves located on or near floor level. 	19-Nov-19
30-Oct-19	19-448	30-Oct-19	Untreated Mine Effluent 12 cubic metres	<p>At the time of the spill event, TMAC was in the process of commissioning components of the Roberts Bay Discharge System (RBDS). The RBDS is designed to transport a single compliant effluent stream consisting of effluent from the Tailings Impoundment Area (TIA) and the underground mine workings. Underground workings at the Doris-Madrid Project are dewatered to allow for continued mining activities. In this process, effluent is pumped from an underground sump to a tank in a water treatment pump house (Tank-001). Prior to the incident, a sump pump underground was replaced, resulting in an increase in</p>	25-Nov-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>effluent reporting to Tank-001 than previously observed. This additional effluent, and increased flow, exceeded the capacity of the pump that conveys effluent from Tank-001 to the TIA. Due to this exceedance in pumping capacity, the effluent level in Tank-001 increased above its holding capacity, and effluent began to flow through an overflow pipe on the tank to a sump on the facility floor. Concurrently to the overflow of Tank-001, an electrical fault caused the pump for the sump receiving the overflow to fail, and as a result, untreated mine effluent overflowed the floor sump and eventually over the doorsills and spilled onto the crushed aggregate pad outside of the pump house.</p> <p>An incident investigation was conducted soon after the incident occurred to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> • Inadequate communication between work groups; • Failure to monitor the pump house building continually during commissioning; • Undersized breaker for sump pump was not identified during dry-commissioning; and • Inadequate warning systems in place prior to wet-commissioning. <p>Upon discovery, the underground effluent pumping was ceased, stopping the active spill. Contaminated snow, ice, and crush was excavated and removed for disposal in the TIA. A larger capacity electrical breaker was also installed to ensure that this particular pump functions as required.</p> <p>In order to reduce the likelihood of a reoccurrence, the incident investigation concluded with the following preventative actions for future work between these work groups, and for future work in the pump house facility:</p> <ul style="list-style-type: none"> • When conditions change underground, or when pumping activities are altered, notifications will be provided to Mill personnel; • Continual physical monitoring of the pump house facility will occur until cameras and automatic controls are installed in the Mill Control Room; and • A high-level alarm for Tank-001 has been installed to notify the control Mill Control Room in advance of a potential overflow situation. 	
5-Nov-19	19-453	5-Nov-19	Untreated Mine Effluent 45 cubic metres	TMAC is in the process of commissioning components of the Roberts Bay Discharge System (RBDS). The RBDS is designed to transport a single compliant effluent stream consisting of effluent from the Tailings Impoundment Area (TIA) and the underground mine workings. Underground workings at the Doris-Madrid Project	05-Dec-19

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<p>are dewatered to allow for continued mining activities. In this process, effluent is pumped intermittently from an underground sump to a tank (Tank-001) located in a water treatment pump house. Tank-001 is drained by Pump-001.</p> <p>At the time of the incident (approx. 02:10am), Pump-001 had shut down as no water was being pumped from the underground workings and the level of Tank-001 was low. When pumping from underground recommenced and filled Tank-001, Pump-001 failed to restart. Effluent began to overflow from Tank-001 onto the floor which activated the sump pump. A high level alarm for Tank-001 had been installed to notify the Mill Control Room in advance of a potential overflow situation, however this alarm failed to initiate during this event. The sump pump directed the effluent into an alternate storage tank in the water treatment pump house (Tank-140). As a result of the heightened load, the level in Tank-140 also increased beyond capacity and effluent began to overflow from this tank onto the floor of the facility. Effluent seeped into the Motor Control Centre (MCC) room and triggered an electrical fault, causing power in the facility to be lost. No alarm was activated when the facility lost power, and the status of the building was not discovered until the next control room rounds at 06:00am. Untreated mine effluent overtopped the doorsills of the building and spilled onto the crush aggregate pad outside the pumphouse. Effluent froze to the surface of the camp pad and no effluent was released to the surrounding environment.</p> <p>An incident investigation was conducted soon after the incident occurred to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> • Inadequate communications between hardware, software and process when the high level alarm failed to communicate to the Mill control room of the potential overflow situation when Pump-001 did not restart; • Inadequate warning systems as no alarm was in place to alert the Mill control room that power was lost in the facility (loss of communications alarm); and • Inadequate barriers in place to prevent water from entering MCC room. <p>The following corrective/preventative actions were identified to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> • Review of control programming and field verification of all alarms. Ensure new alarms are tested prior to recommencing operations; • New alarm will be installed to notify the Mill Control Room if a loss of communications/power has occurred within the facility; 	

Date of Occurrence	Spill Number	Date of Notification to an Inspector	Spilled Material and Volume	Details of Spill Event and Follow up Activities	Date Follow-up Report Provided to an Inspector
				<ul style="list-style-type: none"> Construct concrete berm at the MCC doorway; Install an emergency drainage pipe system from the pump house building to the Sedimentation Control Pond to manage overflow in the event the sump pump system is overwhelmed within the facility. 	
18-Nov-19	19-465	18-Nov-19	Sewage 100 liters	<p>While performing daily inspections, the Sewage Treatment Plant operator identified that the main lift station in Doris Camp had begun to overflow. An estimated 100 L of untreated sewage was released to the gravel floor inside the lift station building. No material was released to the camp pad surrounding the building. At the time of the incident, maintenance was being performed in this section of the camp and a planned power shut down of this area had been conducted. Power to the main lift station had been cut to allow this maintenance to proceed resulting in shutdown of the pump from the main lift station to the Sewage Treatment Plant. Secondary lift stations from other sections of the camp continued to feed into the main camp lift station sump resulting in the overflow.</p> <p>An incident investigation was conducted soon after the incident occurred to determine the root cause. The investigation concluded with the following root causes:</p> <ul style="list-style-type: none"> Failure to identify risk of overflow within the system when initiating the power shutdown; and Inadequate procedures related to shutdown of facilities in this section of the camp which would identify the need to provide backup power to the main lift station pump. <p>Upon discovery, a vacuum truck was used to remove material from within the lift station for transfer to the Sewage Treatment Plant to prevent further overflow until the maintenance was completed and power was restored. Contaminated crush was hand excavated from around the lift station sump and lime was placed on the impacted area to prevent the development of odors or pathogens.</p> <p>The following corrective/preventative actions were identified to reduce the likelihood of a reoccurrence:</p> <ul style="list-style-type: none"> Improved task planning to be completed by Supervisor prior to initiating planned electrical shutdowns; and Identify all infrastructure affected during planned maintenance, the potential risks to that infrastructure and develop mitigation measures to minimize those risks prior to starting a task. 	11-Dec-19

8. Summary of Post Environmental Monitoring Program

TMAC continued relevant monitoring, mitigation implementation, baseline data collection and reporting for the Project in 2019 consistent with Project Certificate No. 003 and Project Certificate No. 009. Baseline data and impact predictions were provided in the respective environmental impacts statements. A summary of monitoring activities undertaken in 2019, and updated conclusions on impact predictions, is summarized in Table 8-1 relating to Project Certificate No. 003, and Table 8-2 relating to Project Certificate No. 009.

Mitigation measures and adaptive mitigation strategies were implemented as outlined in relevant Management Plans (see Section 10). Analyses of the effectiveness of these mitigation measures in terms of potential environmental impact is also summarized in Table 8-1 and Table 8-2, as well as further discussed in the individual compliance monitoring reports submitted to the NIRB, KIA, and the NWB.

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Atmospheric Environment					
Air Quality	The Project is not expected to cause any significant effect on air quality.	<ul style="list-style-type: none">Fuel conservation.Use of a brine solution for dust suppression in the underground mine.Use of coarse rock in roads, airstrip, building pads and laydown areas to minimize dust during construction.Driving at designated speeds on site roads.Application of water to roadways to reduce dust from ore and waste rock haulage and grading to a minimum.Installation of dust covers, sonic sprays, etc. to suppress dust generation from equipment in the crushing facility.Installation of a dust scrubber on the smelting off-gas stream.Submerged release of tailings deposition to avoid tailings dust emissions.Installation of a waste oil burner unit equipped with a settling tank and filter system for particulate removal from the waste oil.Proper equipment maintenance.Adherence to all permits, authorizations and approvals.	<p>Monitoring (Jan-Sept 2019):</p> <ul style="list-style-type: none">Dustfall using Snow Core Sampling.Dustfall using Canisters (Doris and Madrid).TSP, PM₁₀ and PM_{2.5} using Partisol Samplers. <p>Results:</p> <ul style="list-style-type: none">All snow core dustfall measurements were below the ambient air quality objective for residential areas. All measurements were below the maximum dustfall prediction in the 2016 Amendment.One canister dustfall measurement was above the ambient air quality objective for residential areas, but below the air quality objective for commercial and industrial areas. The measurement was near the Doris-Madrid Road and occurred for the summer month with the lowest precipitation and highest winds. The same single canister dustfall measurement was above the maximum 2017 FEIS dustfall prediction (for Madrid Construction), but within the expected variability of the predictions.One TSP measurement was above the ambient air quality objective for operations by 1%. The exceedance is likely attributable to Crown Pillar Recovery Trench progressive reclamation (mainly backfilling) that was occurring around the time of the measurement. The measured concentration is not expected to be representative of air quality of the region due to the proximity of the monitor to the trench. The same measurement was above the 2016 FEIS predictions.All PM₁₀ and PM_{2.5} measurements were below their applicable air quality objectives.	<ul style="list-style-type: none">Air quality measurements were below their applicable criteria, except for one dustfall and one TSP measurement. Exceedances were likely due to Crown Pillar Recovery Trench progressive reclamation and dry/windy conditions.TMAC is in the process of moving station DFA1 to avoid being unduly influenced by local sources and will continue to implement road dust mitigation measures.Measurements are within the expected range of the applicable 2005 FEIS, 2016 Amendment or 2017 FEIS predictions.	<ul style="list-style-type: none">Section 5 Q1-Q3 2019 Atmospheric Compliance Monitoring Program Report - Doris Project (Numami Stantec 2020)Air Quality Management Plan (TMAC 2019)
Noise	The Project is not expected to cause any significant effect on noise levels	<ul style="list-style-type: none">Buildings, structures and material stockpiles will act as physical barriers to noise particularly for outdoor exposed equipment.Most powered equipment will be enclosed in insulated buildings.Proper equipment maintenance.Adherence to all permits, authorizations and approvals.	<ul style="list-style-type: none">For the protection of people, TMAC implements noise monitoring and abatement under its occupational health and safety management program which is reviewed by the WSCC Mines Inspector.For the protection of wildlife, TMAC implements its noise management under its wildlife mitigation and monitoring program.	<ul style="list-style-type: none">No formal noise monitoring was conducted in 2019.No complaints due to Project noise received.Historic monitoring shows consistency with FEIS predictions and mitigations measures continue to be implemented.	<ul style="list-style-type: none">Final Environmental Impact Statement (FEIS)Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a)Hope Bay Health and Safety Management Plan (TMAC 2017)

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Water Quality					
Lake Water Quality	<p>Six pathways of potential environmental effects on water quality were identified:</p> <ul style="list-style-type: none">Seepage and sediment release from permafrost degradation.Solutes and sediment release to runoff from roads, building pads, laydown areas, stockpiles, etc.Nutrient release from the blasting residues.Solute release to supernatant from tailings deposited into Tail Lake.Tailings supernatant discharges into Doris Outflow.Accidental or inadvertent release of deleterious substances. <p>Additional predictions from Water Licence Amendment:</p> <ul style="list-style-type: none">Changes in surface water quality from runoff water from proposed expanded laydown area and ore storage pad.Change from subaqueous to subaerial deposition of tailings in the TIA expected to lead to increased dust generation.	<ul style="list-style-type: none">Implementation of the Doris Aquatic Effects Monitoring Program to adaptively manage any observed effects to freshwater environment.No mining effluent has been or will be discharged to the freshwater environment, as the discharge location has been moved to Roberts Bay.Permafrost degradation was predicted as a risk from the rising water level in Tail Lake due to tailings deposition. The change from subaqueous to subaerial deposition should minimise this risk.Minimizing footprint and diversion of surface runoff to minimize the alteration to runoff patters. Runoff from the pads directed to the Pollution Control Pond.Roads and infrastructure pads sited to avoid waterbodies and designed to minimize the risk for erosion and use of silt fencing if and where necessary.Use of proven dust suppression methods to maintain dust at acceptable levels.No ANFO mixing facility to be located on surface.Management practices for explosives use, which will limit residual nitrate and nitrite present in quarried and waste rock.Identifying and using quarry rock that has a low acid generation and metal leaching potential.Completing winter construction of the roads and building pads, which will mitigate the risk of sediment release during construction.Management practices for sediment control and storm water management during and after construction to collect surface runoff.	<ul style="list-style-type: none">From 2010 to 2016, the AEMP included Doris Lake, Little Roberts Lake, Doris Outflow, and Little Roberts Outflow. The 2017 and 2018 AEMP included Doris Lake.2019 was the first year of implementation of the Belt-wide Hope Bay Project Aquatic Effects Monitoring Plan (TMAC 2018f). The 2019 AEMP included water quality monitoring in lakes near the Doris (Doris Lake) and Madrid North (Patch and Windy lakes) developments because of construction and/or operations activities occurring in these developments.To date, no water quality variables in any monitored lake or stream have exceeded CCME water quality guidelines for the protection of aquatic life as a result of Project activities at the Doris or Madrid North developments.	<p>Mitigation measures implemented to minimize the generation of dust, the transport of runoff into natural waterways, and the introduction of blasting residue or ML/ARD into freshwater waterbodies have been successful as there have been no Project-related exceedances of CCME guidelines in lakes and streams located near Doris Project infrastructure. This is consistent with Project predictions.</p>	<ul style="list-style-type: none">Section 3.3 of the Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report (ERM 2020b)Section 3.3 of Doris Project: 2016 Aquatic Effects Monitoring Program Report (ERM 2017)
Loss of Permafrost	<ul style="list-style-type: none">Permafrost on the shorelines of the TIA may degrade as the water level in the TIA rises due to tailings deposition. Degradation of permafrost may result in shoreline slumping, resulting in sediment and saline porewater releases into the TIA.Permafrost melting in the TIA caused by the Project may be confounded by existing trends in permafrost melting as a result of climate change.	<ul style="list-style-type: none">Permafrost degradation was predicted as a risk from the rising water level in Tail Lake due to tailings deposition. The change from subaqueous to subaerial deposition should minimise this risk. No shoreline slumping has been observed in the TIA.	<p>The TIA shoreline is inspected annually by a professional engineer as part of the annual geotechnical inspections. No shoreline slumping has been observed in the TIA to date.</p>	<p>No shoreline slumping has been observed and therefore no additional actions are required.</p>	<p>2019 TIA Annual Geotechnical Inspection Report (SRK 2019)</p>

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Terrestrial Environment					
Fish					
Arctic Char	FEIS: Loss of habitat in Roberts Bay due to Jetty Construction resulting in non-significant minor effect	<ul style="list-style-type: none">Loss of fish habitat compensated for as outlined in “No Net Loss” Plan (Golder 2007b).	<p>To compensate for the loss of fish habitat in Roberts Bay, four rock shoals were installed in Roberts Bay in 2008.</p> <p>Monitoring:</p> <ul style="list-style-type: none">Biological monitoring and compensation shoal structural stability of the rock shoals was conducted in 2009, 2010, and 2018.Nearshore sediment transport monitoring was conducted in 2008, 2009, 2010, 2012, 2015, and 2018.The next year of monitoring will be in Year 2 of active mine Post-Closure, the date of which will be determined according to the Mine Plan, as approved by DFO. <p>Results:</p> <ul style="list-style-type: none">The shoals appear to be functioning as intended.The density and composition of periphyton, benthic macroinvertebrates, and fish communities are similar, but typically less at enhancement sites compared to reference sites. <p>Some local changes in nearshore sediment distribution that may be related to the construction of the jetty, however, generally minimal to no consistent change in sea-floor elevation since 2006 or between surveys.</p>	<ul style="list-style-type: none">Loss of habitat in Roberts Bay has been compensated for through the construction of four rock shoals. Monitoring is on-going and indicates that compensation has been successful to date. Therefore effects on Arctic Char habitat in marine environment are as predicted in the FEIS.	<ul style="list-style-type: none">Section 4.2.1 in Doris Project “No Net Loss” Plan - Rev. 6 Final Report. (Golder 2007b)Section 3 in Doris Project: 2018 Roberts Bay Jetty Fisheries Authorization Monitoring Report (ERM 2018b)Section 3 in Doris Project: 2018 Roberts Bay Bathymetry Monitoring Report (ERM 2018c)July 6, 2016 Letter from Fisheries and Oceans Canada, Subject: Monitoring Requirements for the Doris Project. Letter from Fisheries and Oceans Canada (DFO 2016)

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Fish (cont'd)					
Lake Trout, Ninespine Stickleback	Doris FEIS: Loss of habitat in Tail Lake (Lake Trout and Ninespine Stickleback) and Tail Lake Outflow (Ninespine Stickleback only) due to MMER Schedule 2 of Tail Lake and construction of tailings dam resulting in significant moderate effect	<ul style="list-style-type: none">Loss of fish habitat in Tail Lake and Tail Lake Outflow compensated for as outlined in “No Net Loss” Plan (Golder 2007b) and subsequent updates (Rescan 2010a and 2010b).	<p>Three strategies were employed to compensate for the loss of fish habitat in Tail Lake and Tail Lake Outflow:</p> <ul style="list-style-type: none">Roberts Lake Outflow Enhancement: Improve access of fish, primarily Arctic Char, to nearby Roberts Lake to increase the productive capacity of the lake. A channel was constructed through the boulder garden “stranding zone” of Roberts Lake Outflow in 2012.Stream E09 Enhancement: Create pool habitat in a stream tributary to Roberts Lake to increase the quantity of nursery habitat for Arctic Char. Two pools were constructed approximately 350 m upstream from Roberts Lake in Stream E09 in 2012.Windy Lake Compensation Shoals: Install rock shoals in Windy Lake to increase the quantity and quality of juvenile Lake Trout rearing habitat. Six rock shoals were constructed in Windy Lake in 2011. <p>Monitoring:</p> <ul style="list-style-type: none">Monitoring of the Roberts Outflow enhancement was conducted in 2013, 2014, and 2015. No monitoring was conducted in 2019. The next year of monitoring is scheduled for 2020.Monitoring of the Stream E09 enhancement was conducted in 2013 and 2014. DFO approved the conclusion of the monitoring program in 2016. No monitoring was conducted in 2019.Monitoring of the Windy Lake compensation shoals was conducted in 2012, 2013, and 2014. DFO approved the conclusion of the monitoring program in 2016. No monitoring was conducted in 2019. <p>Results:</p> <ul style="list-style-type: none">Increased survival of Arctic Char passing through the Roberts Outflow boulder garden in post-enhancement compared to pre-enhancement years.Enhancement pools in Stream E09 are suitable for Arctic Char use, although they did not meet the success criteria as outlined in the No Net Loss Plan. However, DFO concluded in June 2016 that no net loss of fish habitat in Tail Lake was still expected due to the success of the other two compensation strategies.Windy Lake Shoals functioning as intended as compensation habitat. In June 2016, DFO concluded that the shoals had achieved the success criteria set out in the No Net Loss Plan.	<ul style="list-style-type: none">Loss of habitat in Tail Lake and Tail Lake Outflow have been partially compensated for successfully through the Windy Lake Compensation Shoals. The remaining loss of habitat in Tail Lake has been compensated for through the Roberts Lake Outflow and Stream E09 Enhancements. On-going monitoring will confirm the success of these measures. Therefore effects on Lake Trout and Ninespine Stickleback are as predicted in the FEIS.	<ul style="list-style-type: none">July 6, 2016 Letter from Fisheries and Oceans Canada, Subject: Monitoring Requirements for the Doris Project. Letter from Fisheries and Oceans Canada (DFO 2016)Section 3 in Doris Project: 2014 Windy lake Shoal Compliance Monitoring Program (ERM 2014)Section 4 in Doris Project: 2015 Roberts Lake Fish Enhancement Monitoring Program (ERM 2016a)Section 4.1 in Doris Project “No Net Loss” Plan - Rev. 6 Final Report (Golder 2007b)Hope Bay Belt Project: Updates to the Doris No Net Loss Plan for Tail Lake. (Rescan 2010b)Hope Bay Belt Project: Updates to the Doris No Net Loss Plan for Tail Outflow (Rescan 2010c)Section 4.1 in Doris Project: 2014 Roberts Lake and Outflow Fish Compliance Monitoring Program (ERM 2015a)

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Fish (cont'd)					
Lake Trout, Lake Whitefish, Ninespine Stickleback	<p>Doris FEIS: Habitat alteration due to water withdrawal in Doris Lake for potable and process water resulting in non-significant negligible effects.</p> <p>Water Licence Amendment No.1: No adverse effect to fish beyond natural variation due to drawdown of Doris Lake from mining in talik.</p>	<ul style="list-style-type: none">Doris FEIS: Withdrawal will be within the natural annual variations in lake water level.Water Licence Amendment: Use of intercepted groundwater for drilling, ensure compliance with DFO protocol for winter water withdrawal from ice-covered waterbodies, complete field programs to verify locations of Lake Trout spawning habitats an incorporate into management plans.	<p>Monitoring:</p> <ul style="list-style-type: none">Doris Lake water levels are monitored year round at the Doris Lake-2 level monitoring station. Data are downloaded and analyzed monthly and reported to the NWB (monthly and annual reporting by TMAC).Water level drawdown during the winter is monitored to ensure it does not exceed the trigger elevations for adverse effects to fish habitat described in the Doris AEMP.Ice thickness is monitored in April of each year.Collection of data to verify locations and depths of Lake Trout spawning habitats in Doris Lake. <p>Results:</p> <ul style="list-style-type: none">Doris Lake winter drawdown did not reach trigger elevations for adverse effects to fish habitat.In 2019, the maximum extent of ice penetration did not reach the maximum ice penetration threshold of -2.74 m (winter lake drawdown + ice thickness), nor the low action level threshold of -2.42 m. <p>Lake Trout spawning habitats were delineated in Doris Lake in 2015 to establish baseline and assess potential habitat alteration due to water drawdown.</p>	<ul style="list-style-type: none">There is no evidence of an adverse effect of Project-related water use on fish and fish habitat in Doris Lake. Therefore effects on fish habitat are as predicted in the FEIS.	<ul style="list-style-type: none">Section 3.1 in Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report (ERM 2020b)Section 3.1 in Doris Project: 2018 Aquatic Effects Monitoring Program Report (ERM 2019c)Section 3.1 in Doris Project: 2017 Aquatic Effects Monitoring Program Report (ERM 2018a)Section 4.1.2 and 4.1.3 in Doris Lake, Doris Creek, and Little Roberts Outflow Fisheries Assessment (ERM 2016b)

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	Doris FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Fish (cont'd)					
Arctic Char, Lake Trout, Lake Whitefish, Ninespine Stickleback	<p>Doris FEIS: Habitat alteration due to changes in water level and velocity in Doris Creek from TIA discharge resulting in non-significant negligible effects.</p> <p>Water Licence Amendment No. 1: Potential adverse effect on fish habitat due to flow alteration and change in timing, duration, and frequency of flow in Doris Creek from Doris Lake water level drawdown.</p>	<ul style="list-style-type: none">Doris FEIS: Predicted values for water level and velocity in Doris Creek maintained below published sustained swimming speed for Arctic Char.Water Licence Amendment: monitoring of Doris Lake level to assess adverse effects to fish habitat in downstream Doris Creek.	<p>Monitoring:</p> <ul style="list-style-type: none">The Doris Project FEIS predicted effects related to TIA discharge to Doris Creek although this approach is no longer applicable based on revision of mine plan in Water Licence Amendment No. 1. Under the revised mine plan, saline mine water and TIA water will be discharged directly to Roberts Bay.Hydrometric stations located upstream (TL-2) and downstream (TL-3) of the discharge location in Doris Creek were monitored until 2015 to assess potential impact predictions on downstream fish habitat. In 2016, the AEMP was revised to assess effects on fish habitat in Doris Creek through Doris Lake level monitoring.Doris Lake water levels are monitored year round at the Doris Lake-2 level monitoring station. Data are downloaded and analyzed monthly and reported in (Monthly and annual reporting by TMAC)Water level drawdown during the winter is monitored to ensure it does not exceed the trigger elevations for adverse effects to fish habitat described in the Doris AEMP.Ice thickness is monitored in April of each year. <p>Results:</p> <ul style="list-style-type: none">Hydrometric monitoring at TL-2 and TL-3 did not identify effects on fish habitat downstream of the TIA discharge that differed from the predictions in the FEIS.Doris Lake winter drawdown did not reach trigger elevations for adverse effects to fish habitat.In 2019, the maximum extent of ice penetration did not reach the maximum ice penetration threshold of -2.74 m (winter lake drawdown + ice thickness), nor the low action level threshold of -2.42 m.	<ul style="list-style-type: none">Water level and velocity effects on fish VECs due to TIA discharge to Doris Creek predicted in the FEIS are no longer applicable based on revision of mine plan in Water Licence Amendment No. 1.Monitoring indicates no adverse effects on fish habitat due to flow changes in Doris Creek as predicted in Water Licence Amendment.	<ul style="list-style-type: none">Section 3.1 in Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report (ERM 2020b)Section 3.3 Water Quality in Doris Aquatic Effects Monitoring Plan (TMAC 2016b)Section 3.1 in Doris Project: 2018 Aquatic Effects Monitoring Program Report (ERM 2019c), Appendix C-4Section 4 in Doris Project 2014 Hydrology Compliance Monitoring Program (ERM 2015b)Section 4 in Doris Project 2015 Hydrology Compliance Monitoring Program (ERM 2016c)
Arctic Char, Lake Trout, Lake Whitefish, Ninespine Stickleback	<p>Doris FEIS: Habitat alteration in Doris Creek due to reduced water quality from TIA discharge resulting in non-significant negligible effects.</p>	<ul style="list-style-type: none">Doris FEIS: Discharge will meet CCME water quality guidelines.	<p>Monitoring:</p> <ul style="list-style-type: none">The Doris Project FEIS predicted effects related to TIA discharge to Doris Creek. The original AMEP was thus designed to monitor these effects. Under the revised mine plan, saline mine water and TIA water will be discharged directly to Roberts Bay and the AEMP has been revised to reflect this change. The final year of monitoring following the original AEMP was 2016. Starting in 2017, the AEMP focused on potential effects in Doris Lake (i.e., non-point source input) which also have the potential influence fish VECs in downstream Doris Creek. <p>Results:</p> <ul style="list-style-type: none">There was no evidence of adverse water quality effects on fish resulting from exceedances of CCME water quality guidelines in 2019.	<ul style="list-style-type: none">Water quality effects on fish VECs in Doris Creek due to TIA discharge predicted in the FEIS are no longer applicable based on the change of discharge to Roberts Bay in Project Certificate No. 003, amendment No. 1 and Water Licence Amendment No. 1.There are no adverse water quality effects on fish VECs in Doris Creek due to non-point source inputs in Doris Lake.	<ul style="list-style-type: none">Doris Aquatic Effects Monitoring Plan (TMAC 2016b)Section 3.3 in Doris Project: 2016 Aquatic Effects Monitoring Program Report (ERM 2017)Section 3.3 in Doris Project: 2018 Aquatic Effects Monitoring Program Report (ERM 2019c), Appendix C-4Section 3.3 in Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report (ERM 2020b)

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Fish (cont'd)					
Arctic Char, Lake Trout, Lake Whitefish, Ninespine Stickleback (cont'd)	Doris FEIS: Habitat alteration resulting in non-significant negligible to significant major effect.	<ul style="list-style-type: none">Blasting: activities will follow federal and DFO guidelines.Fish harvesting: No-angling policy as a condition of employment.Dust deposition: predicted dust deposition not expected to affect habitat or egg survival.<ul style="list-style-type: none">Accidents, malfunctions, and unplanned events: fuel and hazardous materials storage, transfer and handling are regulated, emergency response and contingency plans in place.	Results: (cont'd) <ul style="list-style-type: none">A blasting monitoring program was developed and implemented that considers potential blasting time restrictions with Fisheries and Oceans Canada's (DFO) Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (Wright and Hopky, 1998) as modified by DFO for use in the North (see Revised Term and Condition 29).No-angling policy in effect.Dustfall is monitored via snow cores and dustfall canisters. Dust deposition does not exceed 1 mm threshold predicted to be protective of fish in the FEIS. No accidents, malfunctions, and unplanned events with significant effects on fish.	<ul style="list-style-type: none">Blasting effects on fish VECs are as predicted in the FEIS.Harvest effects on fish VECs are as predicted in the FEIS.Dust deposition effects on fish VECs are as predicted in the FEIS.<ul style="list-style-type: none">Effects of accidents, malfunctions, and unplanned events on fish VECs are as predicted in the FEIS.	<ul style="list-style-type: none">No fishing policy which is reviewed with all employees at orientationDoris Project: Q1-Q3 2019 Atmospheric Compliance Monitoring Program Report (Stantec 2020)
Socio-Economic Effects					
Community Services and Infrastructure - Health Care Services	Project may increase demand on health care services in Kitikmeot communities due to a change in health conditions of mine workers. Minimal adverse effects are predicted.	<ul style="list-style-type: none">Health and Safety Management PlanPre-Employment Medical TestingEmployee and Family Assistance Plan (EFAP)TMAC Liaison	<ul style="list-style-type: none">There is no evidence that the Project has resulted in an increased demand on health care services from residents of the Kitikmeot region. The rates of utilization remain lower in comparison to the time prior to the Project (e.g., in 2003 or 2004). At the time of writing, community utilization data for 2017, 2018, and 2019 have yet to be released by the GN.In 2018 and 2019, there was no use of community emergency medical services, compared to one incident in 2017. The Project has not resulted in an increased demand on health care services in Kitikmeot communities as a result of Project-related emergencies.	<ul style="list-style-type: none">No adverse effect on health care services. This is consistent with FEIS predictions.	<ul style="list-style-type: none">Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)
Community Services and Infrastructure - Community Well-being and Delivery of Social Services	Small increase in population in Kitikmeot communities as result of the Project, including supplier and spin-off business in Kitikmeot communities. There will be a small or negligible change in the number of Kitikmeot residents relocating. The demand for social housing will be negligible or not significant as a result of in-migration due to the Project. The demand for private housing may increase. Some workers and their families may find rotational employment stressful, leading to termination of employment. Employees may seek assistance to help deal with stress and improve their quality of life.	<ul style="list-style-type: none">Fly-in/fly-out rotationEmployee and Family Assistance Plan (EFAP)TMAC LiaisonFamily communicationsCommunity Involvement PlanInuit Impact and Benefit Agreement	<ul style="list-style-type: none">In 2019, three TMAC employees moved to Edmonton (originally residing in Kugluktuk, Arviat and Cambridge Bay); of that, one employee who initially moved from Cambridge Bay to Edmonton subsequently returned to Cambridge Bay. Although there were no TMAC employees who moved to the Kitikmeot from elsewhere, one employee moved within the region from Kugluktuk to Cambridge Bay. The Project does not appear to be a driver for population growth.The number of people on public housing waitlist increased in Gjoa Haven, Kugaaruk and Taloyoak which can be expected given natural population growth; there was no change in Kugluktuk; and one less person on the waiting list in Cambridge Bay. The number of people waiting for public housing exceeded the number of available public housing. Housing status of Project employees is unknown; the housing status survey is to be developed in the coming years, to be led by the Nunavut Housing Corporation. It is unlikely that the Project has contributed to increased demand for public housing.In 2019, four Inuit employees voluntarily left TMAC. Reasons for leaving included family commitments (3) and seeking promotion in another job (1). TMAC will continue to implement the mitigation and management measures outlined in the IIBA to address this issue.	Minimal adverse effect on community well-being. This is consistent with FEIS predictions. As a management response to monitoring results, TMAC will review employee use of the Employee and Family Assistance Program (EFAP) and other Project provisions, and determine whether the appropriate supports are in place for employees who are homesick or experiencing emotional stress.	<ul style="list-style-type: none">Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Socio-Economic Effects (cont'd)					
Community Services and Infrastructure - Community Well-being and Delivery of Social Services (cont'd)	<p>Project-related workplace accidents should be minimal in number and severity.</p> <p>An increase on demand for social services as a result of the Project is expected to be minor.</p>	<ul style="list-style-type: none">• Health and Safety Management Plan.• Employee and Family Assistance Plan (EFAP).	<ul style="list-style-type: none">• An Employee and Family Assistance Program (EFAP) was established in 2014 and continues to be available to TMAC employees. Between October 2017 and September 2018, there were 14 new counselling and life smart coaching cases, representing an increase in use compared with data for the previous year (when a total of 1.5 persons [standardized measure] accessed the service). Information for 2019 is not available.• There was only one lost time incident in 2019 and 76 minor injuries. TMAC is committed to avoiding workplace accidents, and all lost time incidences are investigated and corrective actions identified and implemented. The company promotes a Zero Harm culture as it believes that all injuries and accidents are preventable.• The number of social assistance cases slightly decreased in 2018; information for 2019 was not available at the time of writing this report.	<ul style="list-style-type: none">• As predicted, workplace accidents are minimal, and there is no observed increase in the use of social services.	
Community Services and Infrastructure - Public Safety and Protection Services	<p>Increased income from Project-related employment can lead to increased alcohol and drug use and other unhealthy choices or behaviours.</p>	<ul style="list-style-type: none">• Community Involvement Plan.• Alcohol and Drug Policy.• Pre-Employment substance abuse screening and criminal record checks	<ul style="list-style-type: none">• There is no indication that overall crime rates have increased as a result of the Project. A direct correlation between changes in Project-related employment and income, and changes in the demand for police services and crime in the Kitikmeot communities is not evident. Although the number of police calls was higher in 2016, 2017, 2018, and 2019 and there was an overall increase in crime in 2016 and 2017 (data for 2018 and 2019 is not available), on a per capita basis, those rates fall within previously recorded levels.• The change in the number of police calls by community as well as the overall crime rate can result from many interacting and complex factors, such as changes in population size, changes in employment and income levels (due to the Hope Bay Project or other projects in the communities), levels of alcohol and drug availability, the relationship between the residents and the Royal Canadian Mounted Police (RCMP), and the availability and use of community service.• In 2015, 2016, and 2017, there was an increase in total impaired driving violations and as well as assault-related violations in the Kitikmeot region; while drug-related violations increased in 2017. By community, while violations increased in some communities, they decreased in others. There is also a substantial inter-annual variation in the number of violations. These factors make it difficult to assess the effect of Project income on the number of violations in each community. Data for 2018 and 2019 is not yet available.	<ul style="list-style-type: none">• No adverse effect on public safety and protection services. This is consistent with FEIS predictions.	<ul style="list-style-type: none">• Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)

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Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Socio-Economic Effects (cont'd)					
Employment and Economy - Employment	<p>The Project will provide significant employment, including directly employing workers from the Kitikmeot region.</p> <p>Hamlet workers with suitable skills and experience may leave their jobs for work at the Project. Communities may find it difficult to find workers with the necessary skills.</p>	<ul style="list-style-type: none">• Inuit Impact and Benefit Agreement.• Human Resources Plan.• Community Involvement Plan.	<ul style="list-style-type: none">• Project employment has exceeded initial predictions. The total number of workers has been increasing with an increase in operating activities, with as many as 760 workers in 2019. Total workforce effort in 2019 totalled 1,333,392 hours.• In 2019, there were as many as 63 Kitikmeot Inuit working at the Project, as well as an additional 15 Inuit from outside of the Kitikmeot region. As measured by workforce effort (total hours worked), Inuit employment at the Project represented about 10% of the total.• In 2019, women comprised about 11% of the total workforce (by hours worked), representing an increase in participation over previous years. Workforce effort by Inuit women was 41,388 hours, or 3% of total workforce effort.• In 2019, of 35 Inuit recruited by TMAC: 12 Inuit hires were employed in different roles at the time of being hired by TMAC - 3 worked for local coop retail while 9 worked in roles within local Hamlets; and 2 Inuit hires were enrolled in Nunavut Arctic College programming (i.e., Adult Basic Education); the remaining were previously unemployed.	<p>Strong positive effects on employment of Inuit. No evidence of adverse effect on competition for labour in the communities due to the Project. This is consistent with FEIS predictions. As a management response to monitoring results, TMAC will:</p> <ul style="list-style-type: none">• Continue to encourage Kitikmeot Inuit to seek employment with the Project.• Monitor the diversity of job types held by Inuit. TMAC expects this to evolve further over time as Inuit skill levels increase as well as interest in mining career opportunities.• Continue to encourage and support the participation of women in the Project’s workforce.• As enabled by the provisions of the IIBA, continue to encourage contractors to rely on Inuit workers, and demonstrate a preference for Kitikmeot Qualified Businesses and other contractors with Inuit content as defined by the IIBA.	<ul style="list-style-type: none">• Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)
Employment and Economy - Economy	<p>Increase in business and personal income from the Project is expected to result in economic benefits to the Kitikmeot region.</p> <p>There will be a minor increase in the cost of living in the communities as a result of the Project.</p> <p>There will be a decrease in the number or value of social assistance payments in the communities as a result of the Project.</p>	<ul style="list-style-type: none">• Inuit Impact and Benefit Agreement.• Human Resources Plan.• Community Involvement Plan.	<ul style="list-style-type: none">• Significant direct benefits have been realized to Kitikmeot personal incomes as a result of the Project.• For 2019, the total payroll for Inuit TMAC employees (excluding contractors) is estimated at \$2.5 million, representing an increase of \$0.6 million over 2018 earnings.• The Project has resulted in substantial business opportunities for Kitikmeot Qualified Businesses in Nunavut. For 2019, TMAC contractor spend totaled \$91.5 million to Kitikmeot Qualified Businesses.• In 2018, the price of food decreased in Cambridge Bay, Gjoa Haven and Taloyoak, but increased in Kugaaruk and Kugluktuk compared to 2017. In general, the cost of food was higher in Kugaaruk and Taloyoak compared to other communities in the Kitikmeot region. Changes to the cost of food have not occurred in line with Project activities and it is unlikely that the Project has had any impact on food prices. Data for 2019 is not available.	<p>Strong positive effects on businesses and personal income in the Kitikmeot region. No evidence of adverse effect on cost of living due to the Project. This is consistent with FEIS predictions, although employment and business benefits have been much higher than originally predicted.</p> <p>As a management response to monitoring results, TMAC will continue to support the development of skills and worker readiness for employment by working with the Kitikmeot Inuit Association (KIA), Government of Nunavut (GN), Nunavut Arctic College and other organizations, as enabled by the provisions of the IIBA. TMAC will continue to pursue a Memorandum of Understanding with the Government of Nunavut and Kitikmeot Inuit Association aimed at increasing coordinated efforts towards mine training and employment. TMAC will also continue to encourage contractors to rely on Inuit workers, and demonstrate a preference for Kitikmeot Qualified Businesses and other contractors with Inuit content as defined by the IIBA.</p>	<ul style="list-style-type: none">• Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)

(continued)

Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (continued)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Socio-Economic Effects (cont'd)					
Employment and Economy - Education and Training	<p>The Project will create opportunities for training and job skills that are transportable.</p> <p>The Project could affect retention rates of youth in school.</p>	<ul style="list-style-type: none">• Inuit Impact and Benefit Agreement.• Human Resources Plan.• Community Involvement Plan.	<ul style="list-style-type: none">• In 2019, TMAC provided 158 hours of general training to Inuit workers, 458 hours of health & safety related training, and 7,754 hours of work-related training.• Two apprenticeship positions have been created thus far. Efforts have been hampered due to the challenges registering apprenticeships in other jurisdictions when the apprenticeship is not able to be registered in Nunavut.• Inuit employees held a mix of unskilled, semi-skilled and skilled positions, while being underrepresented in professional and management positions. In 2018 and 2019, most Inuit workers were in site operations and site services, and to a lesser degree in exploration and environment.• TMAC spent an estimated \$40,000 to support school-based initiatives including Career Awareness Sessions, High School Awards, and Mining Matters events.• TMAC provided five Career Awareness Sessions (one in each Kitikmeot community); two high school-specific career awareness presentations (one in Kugluktuk and one in Cambridge Bay); ten High School Achievement Awards (two in each Kitikmeot community); one Cross Cultural and Life at Camp presentation to Diamond Driller training class in Cambridge Bay (attended by 10 students); and one site visit tour to high school students (attended by 13 students).• High school enrollment remained relatively stable in the Kitikmeot region in 2017. High school completion in 2017 increased in Gjoa Haven and Kugluktuk, remained the same in Cambridge Bay, and decreased in Kugaaruk and Taloyoak; information for 2018 and 2019 was not available at the time of writing this report.	<p>Positive effects on training and the development of a skilled and experienced labour force. This is consistent with FEIS predictions.</p> <p>Overall, Inuit workers received over 10x the amount of on-the-job training (by hours) than non-Inuit workers, on average; this further demonstrates TMAC’s commitment to developing the Inuit workforce and the relative skill and education gap within the Kitikmeot region described in the FEIS. Inuit employment continues to be diverse across work areas. The range of duties discharged by Inuit at site reflects the labour force experience, on-the-job training efforts by TMAC, and Project needs. TMAC expects this to evolve further over time as Inuit increasingly obtain relevant skills as well as awareness the variety of employment opportunities available at the Project</p> <p>TMAC’s involvement in community and student outreach events continues to increase with an increase in Project activities. TMAC committed to host community information and career awareness session in all Kitikmeot communities at least annually to encourage Inuit to attain the skills and education qualifications necessary to take advantage of employment opportunities.</p> <p>As a management response to monitoring results, TMAC will:</p> <ul style="list-style-type: none">• As enabled by the provisions of the IIBA, continue to support the development of skills and worker readiness for employment by working with the Kitikmeot Inuit Association (KIA), Government of Nunavut (GN), Nunavut Arctic College and other organizations.• Identify opportunities for job shadowing, apprenticeships, and summer students as circumstances allow and communicate with local communities once opportunities become available.	<ul style="list-style-type: none">• Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)

(continued)

Table 8-1. Summary of Post Environmental Assessment Monitoring Program under Project Certificate No. 003 (completed)

Value Component	FEIS Predictions	Mitigation	Monitoring Results	Conclusions	Reference
Socio-Economic Effects (cont'd)					
Employment and Economy - Business Opportunities	<p>The Project will make positive contributions to Kitikmeot and Nunavut businesses.</p> <p>There will be an increase in local business capacity as a result of the Project.</p>	<ul style="list-style-type: none">• Inuit Impact and Benefit Agreement.• TMAC Liaison.	<ul style="list-style-type: none">• The Project has made significant positive contributions to the Kitikmeot and Nunavut economy.• TMAC awarded \$91.5 million in contracts to Nunavut businesses, all with Kitikmeot Qualified Businesses (KQB) as defined under the Hope Bay IIBA. The total number of contracts was 19, with an average value of \$4.8 million. An estimated 45% of the total value of contracts awarded by TMAC was awarded to Nunavut businesses in 2019.• In 2019, there were 68 registered Inuit Firms in the Kitikmeot region of which 26 were KQB. Many businesses in the Kitikmeot region provide mining services. The development of these businesses may have been supported by the Project or by other mining projects and exploration in the region.	<p>Strong positive effects on Inuit-owned businesses in the Kitikmeot region. This is consistent with FEIS predictions, although business benefits have been much higher than originally predicted.</p> <p>As a management response to monitoring results, TMAC will continue to encourage contractors to rely on Inuit workers, and demonstrate a preference for Kitikmeot Qualified Businesses and other contractors with Inuit content as defined by the IIBA.</p>	<ul style="list-style-type: none">• Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)
Heritage Resources	<ul style="list-style-type: none">• Direct effects of construction associated with Doris on three sites in Roberts Bay (NbNh-13, 23, 28), one site (NaNh-4) near Doris site, one site along TIA road (NaNh-28), and one site in the TIA quarry (NaNh-30).• Doris amendments affected an additional eight sites (NaNh-62, 63, 64, 90, NbNh-12, 27, 47, 48).• Indirect effects were identified as possible for 32 sites.	<ul style="list-style-type: none">• The six sites were mitigated by systematic data recovery for Doris.• Seven sites were mitigated by systematic data recovery re Amendments and one site (NbNh-12) is partly mitigated/partly protected.• Periodic monitoring and protection as needed for those sites potentially indirectly affected.	<ul style="list-style-type: none">• No additional sites were affected by construction or operations activities.• 2019 field program included ground surveys of proposed exploration zones and Madrid-Boston AWR route; revisiting previously recorded sites in these areas to confirm locations; completion of mitigation of NaNh-100; and detailed assessment and plan mapping of 8 sites potentially to be affected by development in the near future.• 22 archaeological sites were newly recorded in 2019.• 21 years of investigations completed up to and including 2019 have resulted in the recording of 332 archaeological sites, 32 of which were mitigated due to various project related potential disturbances over the years.	<ul style="list-style-type: none">• Systematic data recovery provided positive benefits of recovering cultural information.• Monitoring ensured no inadvertent impacts on recorded sites. This is consistent with FEIS predictions.	<ul style="list-style-type: none">• Hope Bay Project, Nunavut: Archaeological Investigation in 2019 Final Permit Report (Points West Heritage Consulting 2020)

Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Atmospheric Environment	Ambient Air Quality	<ul style="list-style-type: none">Changes to ambient air quality	<ul style="list-style-type: none">A portion of the TIA will be subaqueous to help reduce fugitive dust emissions.Stacks with sufficient height to help reduce ground level air contaminates.Road and infrastructure optimization to reduce transportation and haul distances.Employee training and instruction relating to process control and air emissions.Waste recycling program to reduce incinerated waste.Emission control systems used on equipment, where applicable.Fuel efficient and low emission equipment use, where applicable.Regular equipment servicing and preventative maintenance.Dust suppressants applied to roads, stockpiles, TIA and TMA where needed.Road speed limit of 50 km/hr.Contour stockpiles and install engineering dust controls, where needed.Adaptive management through air quality monitoring.Stack testing and reporting, when applicable.Ongoing dust deposition and airborne particulate monitoring and reporting.	<p>Monitoring (Jan -Sept 2019):</p> <ul style="list-style-type: none">Dustfall using Snow Core Sampling.Dustfall using Canisters (Doris and Madrid).TSP, PM₁₀ and PM_{2.5} using Partisol Samplers. <p>Results:</p> <ul style="list-style-type: none">All snow core dustfall measurements were below the ambient air quality objective for residential areas. All measurements were below the maximum dustfall prediction in the 2016 Amendment.One canister dustfall measurement was above the ambient air quality objective for residential areas, but below the air quality objective for commercial and industrial areas. The measurement was near the Doris-Madrid Road and occurred for the summer month with the lowest precipitation and highest winds. The same single canister dustfall measurement was above the maximum 2017 FEIS dustfall prediction (for Madrid Construction), but within the expected variability of the predictions.One TSP measurement was above the ambient air quality objective for operations by 1%. The exceedance is likely attributable to Crown Pillar Recovery Trench progressive reclamation (mainly backfilling) that was occurring around the time of the measurement. The measured concentration is not expected to be representative of air quality of the region due to the proximity of the monitor to the trench. The same measurement was above the 2016 FEIS predictions.All PM₁₀ and PM_{2.5} measurements were below their applicable air quality objectives.	<ul style="list-style-type: none">Changes to ambient air quality.	Not significant	<ul style="list-style-type: none">Q1-Q3 2019 Atmospheric Compliance Monitoring Program Report - Doris Project (Numami Stantec 2020)Air Quality Management Plan (TMAC 2019)
	Noise and Vibration	<ul style="list-style-type: none">Effect on HumansEffect on Wildlife	<ul style="list-style-type: none">Mobile equipment with appropriate mufflers and silencers and follow manufacturer recommended maintenance schedules; Use enclosures for ore processing (including crushing), power, and air compression activities. Processing enclosures should achieve at least an STC30 rating, and the Boston Power Generation Facility enclosure should also achieve a STC30 rating Ore concentrating and processing conducted indoors to reduce noise emissions.The Boston Power Generation Facility exhausts could include a silencer to reduce combustion exhaust noise emissions.Haul road designed to optimise the haulage route to avoid receptors, where feasible, and to minimise the distance travelled to reduce the overall noise generation.Mobile equipment travelling within speed limits.	<p>For the protection of people, TMAC implements noise monitoring and abatement under its occupational health and safety management program which is reviewed by the WSCC Mines Inspector.</p> <ul style="list-style-type: none">No complaints due to Project noise received. <p>For the protection of wildlife, TMAC implements its noise management under its wildlife mitigation and monitoring program.</p>	<ul style="list-style-type: none">Effect on Humans.Effect on Wildlife.	Not Significant (see Terrestrial Wildlife VECs)	<ul style="list-style-type: none">Hope Bay Health and Safety Management Plan (TMAC 2017)Hope Bay Project Wildlife Mitigation and Monitoring Plan (TMAC 2019a)

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Vegetation and Special Landscape Features	Vegetation, Caribou, Grizzly Bear, Wolverine, Upland Breeding Birds, Waterbirds, Raptors	<ul style="list-style-type: none">Loss of vegetationHabitat loss for Caribou, Grizzly Bear, Wolverine, Upland Breeding Birds, Waterbirds, RaptorsAlteration of vegetation	<ul style="list-style-type: none">Minimize footprint of facilities.Avoidance of sensitive areas and rare plants during Project design.Minimize disturbance of vegetation, permafrost and soils outside of Project footprints.Limit dust production - dust suppressants on roads.Speed limits to reduce dust generation.Vehicles restricted to site roads and quarry footprints and ice roads.Minimize soil degradation (i.e., erosion) by establishing and implementing erosion control.Reclaim unused disturbed areas where possible.Monitor water quality to meet discharge requirements.Adequate fill depths to ensure preservation of permafrost.	<ul style="list-style-type: none">The Project footprint is measured and reported each year in the WMMP Report. The total Project footprint is 121.9 ha. This represents less than 0.1% of available suitable habitat for caribou, grizzly bear, and wolverine in the RSA and 0.2-0.3% of suitable available habitat for breeding birds, waterbirds, and raptors in the LSA.Vegetation monitoring baseline sedge samples were collected in 2018 but not repeated in 2019. Additional vegetation monitoring will be conducted during construction of the Madrid-Boston All Weather Road and the Boston Project Area.	<ul style="list-style-type: none">Loss of vegetation.None Predicted	<ul style="list-style-type: none">Not significant-	<ul style="list-style-type: none">Addresses Madrid-Boston Final Hearing Commitment 1Section 2.1 Habitat Loss and Alteration, and Section 3.13 Plants in Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)
	Special landscape features	<ul style="list-style-type: none">Loss of special landscape featuresAlteration of special landscape features	<ul style="list-style-type: none">Avoidance of special landscape features (rock outcrops, rare wetlands, where rare plants are more abundant during Project design).Minimize disturbance of vegetation, permafrost and soils outside of Project footprints.Limit dust production - dust suppressants on roads.Speed limits to reduce dust generation.Vehicles restricted to site roads and quarry footprints and ice roads.Minimize soil degradation (i.e., erosion) by establishing and implementing erosion control.Reclamation of unused disturbed areas where possible.Monitor water quality to meet discharge requirements.Adequate fill depths to ensure preservation of permafrost.	<ul style="list-style-type: none">Monitoring the loss of special landscape features was a commitment made during the review of the Phase 2 Project and began in 2019. Prior to 2019, 32.3 ha of special landscape features were removed due to Project construction, primarily of rock outcrops. During 2019, an additional 1.5 ha of special landscape features were removed, for a total of 33.8 ha.	<ul style="list-style-type: none">Loss of special landscape features.None Predicted	<ul style="list-style-type: none">Not significant-	<ul style="list-style-type: none">N/A

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Terrestrial Wildlife and Wildlife Habitat	Dolphin and Union (Island) Caribou herd	<ul style="list-style-type: none">Habitat lossDisturbanceDisruption of MovementAttraction to the ProjectDirect MortalityIncreased Access and HarvestChanges in Environmental Media Quality	<ul style="list-style-type: none">Employee awareness / environmental induction program.Open water marine resupply to avoid Dolphin and Union caribou migration on the sea ice.Plan footprint to avoid sensitive wildlife areas.Minimize footprint of facilities.Limit dust production - dust suppressants on roads.Maintaining equipment to limit noise production.Surveys prior to blasts to limit disturbance if caribou present.Speed limits to minimize the chance of collisions with wildlife and noise.TMAC has a no hunting policy for all personnel while working on site.Identify locations of the AWR with Elders and harvesters for caribou crossing structures to facilitate crossing for wildlife.Snow management on roads.Helicopters to avoid caribou by at least 300 m vertically and 600 m horizontally where safe to do so.Fixed-wing aircraft to maintain a minimum of 610 m elevation except when landing or taking off where safe to do so.If caribou near airstrip (250 m) then delay flights to keep caribou safe and avoid disturbance, when safe to do so.	<ul style="list-style-type: none">At the time of publishing the report, the collar data from the Dolphin and Union caribou had not yet been delivered by the GN. Traditional Knowledge and land users from the Inuit Environmental Advisory Committee (IEAC) indicate that Dolphin and Union caribou now cross the sea-ice to the west of Cambridge Bay, near Wellington Bay. IEAC members also indicated that Dolphin and Union caribou are no longer wintering on the northern part of the Kent peninsula. Other than these shifts, which began before 2019, Traditional Knowledge and collar data indicate that the Dolphin and Union caribou have maintained a consistent usage of the area surrounding the Hope Bay Project area for over 20 years, with some animals transiting the area during spring and fall migration and low numbers of caribou in the area during winter. Pending submission of the data by the GN, an addendum to the WMMP Report will be submitted to the NIRB.	<ul style="list-style-type: none">Habitat loss.Disturbance.Disruption of movement.	Not significant	<ul style="list-style-type: none">Section 3.4 and Caribou in Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f)
	Beverly and Ahiak Caribou sub populations	<ul style="list-style-type: none">Habitat lossDisturbanceDisruption of MovementAttraction to the ProjectDirect MortalityIncreased Access and HarvestChanges in Environmental Media Quality	<ul style="list-style-type: none">Employee awareness / environmental induction program.Plan footprint to avoid sensitive wildlife areas.Minimize footprint of facilities.Limit dust production - dust suppressants on roads.Maintaining equipment to limit noise production.Surveys prior to blasts to limit disturbance if caribou present.Speed limits to minimize the chance of collisions with wildlife and noise.Vehicles must give wildlife the right of way. Drivers to stay in their vehicles when caribou present so not to disturb caribou.TMAC has a no hunting policy for all personnel while working on site.Identify locations of the AWR with Elders for caribou crossing structures to facilitate crossing for wildlife.Snow management on roads.Helicopters to avoid caribou by at least 300 m vertically and 600 m horizontally where safe to do so.Fixed-wing aircraft to maintain a minimum of 610 m elevation except when landing or taking off where safe to do so.	<ul style="list-style-type: none">The kernel density analyses of the Beverly/Ahiak calving range at 50% did not show overlap with the Project Study Area using both 2019 collar data and a compilation of data from 2001 to 2018. Kernel density analyses at 95% indicated some overlap of the Beverly caribou calving range with the Project Study Area using the 2019 collar data. Detailed assessment of collar telemetry data indicate that one female caribou appeared to calf within the Study Area in 2019. Two other females were outside of the historic calving grounds, skewing the 95% kernel density to overlap the Project Study Area in 2019. Results indicate that no additional mitigation specific to the caribou calving period are required at present.	<ul style="list-style-type: none">Habitat loss.Disturbance.	Not significant	<ul style="list-style-type: none">Section 3.4 and Caribou in Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f)

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Terrestrial Wildlife and Wildlife Habitat (cont'd)	Beverly and Ahiak Caribou sub populations (cont'd)			<ul style="list-style-type: none">To assess whether caribou collar data are sufficient for monitoring interactions with the Project, Beverly-Ahiak Caribou Utilization Distributions were bootstrapped and assessed for percent overlap with Project infrastructure buffered at 5 km and 14 km potential ZOIs. Distributions were also shifted 5-10 km further from the Project to test whether such a shift could be detected given the current dataset. For the Beverly/Ahiak herd, calving distributions at 95% and 99% UD had functionally 0% overlap with the Project at either the 5 km or 14 km potential ZOIs. Therefore, it is not possible to reliably test for a ZOI around the Project given the current distributions, regardless of the number of collared caribou.			
	Caribou	<ul style="list-style-type: none">Habitat lossDisturbanceDisruption of MovementAttraction to the ProjectDirect MortalityIncreased Access and HarvestChanges in Environmental Media Quality	<ul style="list-style-type: none">Employee awareness / environmental induction program.Plan footprint to avoid sensitive wildlife areas.Minimize footprint of facilities.Limit dust production - dust suppressants on roads.Maintaining equipment to limit noise production.Surveys prior to blasts to limit disturbance if caribou present.Speed limits to minimize the chance of collisions with wildlife and noise.Vehicles must give wildlife the right of way. Drivers to stay in their vehicles when caribou present so not to disurb caribou.TMAC has a no hunting policy for all personnel while working on site.Identify locations of the AWR with Elders for caribou crossing structures to facilitate crossing for wildlife.Snow management on roads.Helicopters to avoid caribou by at least 300 m vertically and 600 m horizontally where safe to do so.Fixed-wing aircraft to maintain a minimum of 610 m elevation except when landing or taking off where safe to do so.	<ul style="list-style-type: none">There were few caribou observations at cameras recorded across the 38 month monitoring period, including 21, 44, and 66 observations respectively in the Treatment zone close to Project infrastructure (< 2 km), potential Zone of Influence (ZOI; 2 - 10 km), and Control zone (> 10 km from Project infrastructure).Statistical analysis indicated that there was a significant difference in caribou occupancy between the Treatment and Control zones. However, additional analysis using continuous distance to infrastructure did not indicate any ZOI (no significant result).30 cameras deployed in June and September 2019 are collecting baseline data for the Madrid-Boston AWR and Boston Project areas.There was one interaction with caribou at the airstrip that required deterrence prior to a flight arriving. The caribou left the airstrip and the flight landed without issue.	<ul style="list-style-type: none">Habitat loss.Disturbance.	Not significant	<ul style="list-style-type: none">Section 3.4 and Caribou in Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f)

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Terrestrial Wildlife and Wildlife Habitat (cont'd)	Muskox	<ul style="list-style-type: none">Habitat lossDisturbanceDisruption of MovementAttraction to the ProjectDirect MortalityIncreased Access and HarvestChanges in Environmental Media Quality	<ul style="list-style-type: none">Employee awareness / environmental induction program.Plan footprint to avoid sensitive wildlife areas.Minimize footprint of facilities.Limit dust production - dust suppressants on roads.Maintaining equipment to limit noise production.Surveys prior to blasts to limit disturbance if muskox present.Speed limits to minimize the chance of collisions with wildlife.Vehicles must give wildlife the right of way. Drivers to stay in their vehicles when wildlife present.TMAC has a no hunting policy for all personnel while working on site.Identify locations of road embankment along AWR with Elders and hunters that could be graded to facilitate crossing for wildlife.Snow management on roads.Helicopters to avoid caribou by at least 300 m vertically and P600 m horizontally where safe to do so.Fixed-wing aircraft to maintain a minimum of 610 m elevation except when landing or taking off where safe to do so.	<ul style="list-style-type: none">There were very few muskox observations at cameras recorded across the 38 month monitoring period, including 28, 8, and 6 observations respectively in the Treatment zone close to Project infrastructure (< 2 km), potential ZOI (2 - 10 km), and Control zone (> 10 km from Project infrastructure).Due to the small sample size and limited years with observations, statistical analysis on muskox occupancy near the Project was not conducted. The raw data indicate that Muskox are more commonly observed in the Treatment zone, nearest Project Infrastructure, and are therefore not likely avoiding the Project.30 cameras deployed in June and September 2019 are collecting baseline data for the Madrid-Boston AWR and Boston Project areas.	<ul style="list-style-type: none">Habitat loss.Disturbance.	Not significant	<ul style="list-style-type: none">Section 3.5 and Muskox in Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a).Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f).
	Grizzly Bear	<ul style="list-style-type: none">Habitat lossDisturbanceDisruption of MovementAttraction to the ProjectDirect MortalityIncreased Access and HarvestChanges in Environmental Media Quality	<ul style="list-style-type: none">Employee awareness / environmental induction program.Plan footprint to avoid sensitive wildlife areas.Minimize footprint of facilities.Limit dust production - dust suppressants on roads.Maintaining equipment to limit noise production.Surveys prior to blasts to limit disturbance if bears present.Speed limits to minimize the chance of collisions with wildlife.Vehicles must give wildlife the right of way.Drivers to stay in their vehicles when wildlife present.TMAC has a no hunting policy for all personnel while working on site.Identify locations of road embankment along AWR that could be graded to facilitate crossing for wildlife.Snow management on roads.Helicopters to avoid caribou by at least 300 m vertically and 600 m horizontally where safe to do so.Fixed-wing aircraft to maintain a minimum of 610 m elevation except when landing or taking off where safe to do so.Waste management, camp hygiene along with employee education will limit the attractiveness of the Project for bears.	<ul style="list-style-type: none">Statistical analysis of grizzly bear camera data indicated no significant differences between the predicted number of grizzly bear events at cameras in the Treatment zone relative to cameras in the Control zone based on data collected from June 2016 to September 2019.No analysis for a potential ZOI was conducted given the lack of significant result of the predicted number of events between cameras in the Treatment and Control zones.There were 41 grizzly bear interactions. Interactions with grizzly bear were more common than previous years but were not localized to particular areas and did not involve the same individuals repeatedly; grizzly bear consistently responded to deterrents. The increase in interactions do not appear to indicate problems with on site management practices or problem bears. The increased encounters with grizzly bear in 2019 was possibly driven by poor weather conditions or prey availability which drove bears to forage near the Project more frequently and aggressively than most years.30 cameras deployed in June and September 2019 are collecting baseline data for the Madrid-Boston AWR and Boston Project areas.	<ul style="list-style-type: none">Habitat loss.Attraction to the Project.	Not significant	<ul style="list-style-type: none">Section 3.6 Grizzly Bear in Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a).Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f).

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Terrestrial Wildlife and Wildlife Habitat (cont'd)	Furbearers (Wolverine)	<ul style="list-style-type: none">Habitat lossDisturbanceDisruption of MovementAttraction to the ProjectDirect MortalityIncreased Access and HarvestChanges in Environmental Media Quality	<ul style="list-style-type: none">Employee awareness / environmental induction program.Plan footprint to avoid sensitive wildlife areas.Minimize footprint of facilities.Limit dust production - dust suppressants on roads.Maintaining equipment to limit noise production.Speed limits to minimize the chance of collisions with wildlife.Vehicles must give wildlife the right of way.TMAC has a no hunting policy for all personnel while working on site.Identify locations of road embankment along AWR that could be graded to facilitate crossing for wildlife.Snow management on roads.Helicopters to avoid caribou by at least 300 m vertically and 600 m horizontally where safe to do so.Fixed-wing aircraft to maintain a minimum of 610 m elevation except when landing or taking off where safe to do so. Waste management, camp hygiene along with employee education will limit the attractiveness of the Project for furbearers.	<ul style="list-style-type: none">There were low numbers of wolverine events recorded from June 2016 to September 2019 on cameras, there were four observations at Treatment cameras near Project infrastructure, 27 observations at potential ZOI cameras, and 28 observations at Control cameras far from infrastructure.Statistical analysis of wolverine occupancy indicated no significant differences between cameras in the Treatment zone close to Project infrastructure compared to cameras in the Control zone far from Project infrastructure.30 cameras deployed in June and September 2019 are collecting baseline data for the Madrid-Boston AWR and Boston Project areas.There were no wolverine interactions or incidents.	<ul style="list-style-type: none">Habitat loss.Attraction to the Project.	Not significant	<ul style="list-style-type: none">Sections 3.6 Grizzly Bear in Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f)
	Raptors	<ul style="list-style-type: none">Habitat lossDisturbanceAttraction to the ProjectDirect MortalityChanges in Environmental Media Quality	<ul style="list-style-type: none">Employee awareness / environmental induction program.Minimize footprint of facilities.Clearing and construction at sensitive locations for ground-nesting raptors to occur outside of the sensitive time periods (breeding period) or to be accompanied by nest survey during sensitive periods.Avoidance of known nests or nesting areas, where possible.	<ul style="list-style-type: none">In 2019, a comprehensive statistical analysis was conducted using 37 years of data from the GN, GNWT, and TMAC breeding raptor data. Trends in raptor nesting by distance to the Project and in response to weather and prey availability changes were analysed for golden eagle, rough-legged hawk, peregrine falcon, and gyrfalcon. A scientific publication was written and is being peer-reviewed for publication.Two raptor species, rough-legged hawk and peregrine falcon, were occupying breeding territories within two kilometers of construction activities. Only one occupied territory had an active nest less than one kilometer from infrastructure; a nest management plan was created in consultation with the GN DOE. The nest was monitored weekly until it fell off of its ledge (i.e., failed) before the single egg hatched in mid-July.Peregrine falcon are a species of conservation concern. Short-eared owls are also a species of conservation concern which were recorded incidentally on wildlife cameras.There were no interactions or incidents with raptors in 2019.	<ul style="list-style-type: none">Habitat loss.Disturbance.	Not significant	<ul style="list-style-type: none">Sections 3.11 Raptors in Hope Bay Project: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f)

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Terrestrial Wildlife and Wildlife Habitat (cont'd)	Waterbirds and Shorebirds	<ul style="list-style-type: none">• Habitat loss• Disturbance• Attraction to the Project• Direct Mortality• Increased Access and Harvest• Changes in Environmental Media Quality	<ul style="list-style-type: none">• Employee awareness / environmental induction program.• Minimize footprint of facilities.• Conduct ground clearing outside of sensitive nesting periods for waterbirds or conduct pre clearing surveys for waterbirds if construction cannot be scheduled outside of sensitive period policies that prohibit hunting on site, littering, and feeding wildlife.• Speed limits, giving wildlife the right of way, and dust control on roads.• Avoidance of areas of large concentrations of foraging or moulting birds.• Avoidance of known nests or nesting areas.	<ul style="list-style-type: none">• A power analysis of the waterbird dataset to date was conducted to assess the power to predict a possible Project-related effect on waterbird distribution. Additional explanatory information regarding the 2018 comprehensive analyses are also provided in the power analyses Appendix.• Water quality at the TIA was monitored weekly and did not exceed relevant CCME guidelines, so no ecological risk assessment was conducted.• There were two interactions with geese on the airstrip which required deterrence.	<ul style="list-style-type: none">• Habitat loss.• Disturbance.• Disruption of movement.	Not significant	<ul style="list-style-type: none">• Section 3.10 Waterbirds and Shorebirds Hope Bay: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)• Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f)• Addresses Madrid-Boston Final Hearing Commitment 31, Term and Condition 26
	Upland Birds	<ul style="list-style-type: none">• Habitat loss• Disturbance• Attraction to the Project• Direct Mortality• Increased Access and Harvest• Changes in Environmental Media Quality	<ul style="list-style-type: none">• Employee awareness / environmental induction program.• Minimize footprint of facilities.• Conducting ground clearing outside of sensitive nesting periods for upland birds or conduct pre clearing surveys for upland breeding birds if construction cannot be scheduled outside of sensitive periods.• Ensure that waste management facilities and Project buildings are wildlife-proof.• Policies that prohibit hunting on site, littering, and feeding wildlife.• Speed limits, giving wildlife the right of way, and dust control on roads.• Avoidance of known nests or nesting areas.	<ul style="list-style-type: none">• Pre-clearing surveys for nesting birds were conducted in June and July 2019 prior to construction activities. One songbird nest with three eggs was located and buffered; construction activities were avoided until surveys indicated that neither areas still had active birds in them.• No upland breeding bird interactions or mortalities were recorded in 2019.	<ul style="list-style-type: none">• Habitat loss.• Disturbance.• Disruption of movement.	Not significant	<ul style="list-style-type: none">• Section 3.9 Upland Breeding Birds Hope Bay: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)• Wildlife Mitigation and Monitoring Plan: Hope Bay Project, Nunavut (TMAC 2019f)
Surface hydrology	Surface water quantity	<ul style="list-style-type: none">• Alteration of Streamflow at Doris Watershed• Alteration of Streamflow at Windy Watershed• Alteration of Streamflow at Aimaokatalok Watershed	<ul style="list-style-type: none">• Using existing infrastructure, and minimizing footprint and contact water.• Recycling and reusing contact water.• Following permit conditions for water withdrawals.• Contact water storage facilities designed for high flows.• Incorporation of climate change in design flows.• Implementation of erosion control measures.• Adherence regulatory requirements for culvert maintenance and in-water work.• Monitoring ponds and the TIA.• Using groundwater to reduce fresh water consumption.	<ul style="list-style-type: none">• Lake levels, and lake outflows where applicable, for ten water bodies were monitored as part of the Aquatic Effects Monitoring Program (AEMP).• Monitoring results indicated that lake levels and outflow were within natural variation of previously collected baseline data.	<ul style="list-style-type: none">• Alteration of streamflow in Doris Watershed.• Alteration of streamflow in Windy Watershed.• Alteration of streamflow in Aimaokatalok Watershed.	Not significant	<ul style="list-style-type: none">• Appendix B of the Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report (ERM 2020b)

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Freshwater Water Quality	Surface water quality	<ul style="list-style-type: none">• Site Preparation, Construction, and Decommissioning• Site and Mine Contact Water• Water Use• Quarries and Borrow Pits• Explosives• Fuels, Oils, and PAH• Treated Sewage Discharge• Dust Deposition	<ul style="list-style-type: none">• Use existing infrastructure for Doris Project and minimize footprint of Madrid-Boston infrastructure.• Build on competent bedrock and use geochemically stable rock for roads, pads, and structures.• Recycle site and mine water.• Adhere to Federal and Territorial standards for emissions, in-water works, explosives, and receiving water criteria.• Follow BMPs outlined in site management plans, including the Madrid-Boston Aquatic Effects Monitoring Plan (AEMP).• Treat sewage and mine water as appropriate and discharge to tundra or waterbodies as required by regulations and permits.• Implement sediment and erosion control measures to reduce over-land water flow and direct water to management structures.• Store fuels and petroleum in secondary containment systems with appropriate spill contingencies in place.• Regular inspections of management structures and adherence to site surveillance plans as directed by Water Licences.	<ul style="list-style-type: none">• 2019 was the first year of implementation of the Belt-wide Hope Bay Project Aquatic Effects Monitoring Plan (TMAC 2018f). The goals of the Aquatic Effects Monitoring Program (AEMP) are to evaluate potential Project effects on the surrounding freshwater environment during the construction and operation of the Project and verify predictions from the Madrid-Boston FEIS.• The 2019 AEMP included water quality monitoring in lakes near the Doris (Doris Lake) and Madrid North (Patch and Windy lakes) developments because of construction and/or operations activities occurring in these developments. Lakes associated with the Madrid South and Boston developments will be incorporated into the AEMP once construction begins in these developments.• 2019 water quality data from Windy and Patch lakes were compared to baseline conditions and to water quality in the reference lake (Reference Lake B) to determine whether there was evidence of any Project-related changes to surface water quality. The AEMP found no evidence of any Project-related effects to freshwater water quality in Windy and Patch lakes, and no water quality variables exceeded CCME water quality guidelines for the protection of aquatic life as a result of Project activities.	<ul style="list-style-type: none">• Site Preparation, Construction, and Decommissioning.• Site and Mine Contact Water.• Explosives.	Not Significant	<ul style="list-style-type: none">• Hope Bay Project: Aquatic Effects Monitoring Plan (TMAC 2018f)• Section 3.3 of the Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report (ERM 2020b)
Freshwater Sediment Quality	Sediment quality	<ul style="list-style-type: none">• Site Preparation, Construction, and Decommissioning• Site and Mine Contact Water• Quarries and Borrow Pits• Explosives• Fuels, Oils, and PAH• Treated Sewage Discharge• Dust Deposition	<ul style="list-style-type: none">• Same as Freshwater Water Quality.	<ul style="list-style-type: none">• 2019 was the first year of implementation of the Belt-wide Hope Bay Project Aquatic Effects Monitoring Plan (TMAC 2018f).• The 2019 AEMP included the collection of sediment quality samples from lakes near the Doris (Doris Lake) and Madrid North (Patch Lake) developments because of construction and/or operations activities occurring in these developments.• 2019 sediment quality data from Patch Lake were compared to baseline conditions and to sediment quality in the reference lake (Reference Lake B) to determine whether there was evidence of any Project-related changes to sediment quality. The AEMP found no evidence of any Project-related effects to sediment quality in Patch Lake, and no sediment quality variables exceeded CCME sediment quality guidelines for the protection of aquatic life as a result of Project activities.	<ul style="list-style-type: none">• Site Preparation, Construction, and Decommissioning.• Site and Mine Contact Water.	Not Significant	<ul style="list-style-type: none">• Hope Bay Project: Aquatic Effects Monitoring Plan (TMAC 2018f)• Section 3.4 of Hope Bay Project: 2019 Aquatic Effects Monitoring Program Report (ERM 2020b)

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Freshwater Fish	Fish habitat	• Habitat loss or alteration	• DFO’s Measures to Protect Fish and Fish Habitat. • Restricted Activity Timing Windows. • Management plans including Environmental Protection Plan. • Infrastructure sited to avoid fish-bearing habitat where possible. • Infrastructure design minimizes footprint and avoids critical freshwater fish habitat. • Design of crossing structures to maintain fish passage at water crossings along all-weather roads. • Limiting water withdrawal by recycling water, limiting groundwater inflows, and returning compliant effluent to waterbodies from which they were withdrawn. • Fisheries offsetting measure as deemed necessary and approved by DFO.	• There has been no alteration or loss of fish or fish habitat nor a <i>Fisheries Act</i> Authorization granted for predicted effects on fish and fish habitat by the Project. A monitoring program will be approved during the <i>Fisheries Act</i> Authorization process. • No culverts have been constructed. A DFO request for review will be completed prior to any culvert construction on fish bearing waters outlining mitigation and monitoring requirements.	None predicted	Not Significant -	• DFO’s Measures to Protect Fish and Fish Habitat: https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
		• Changes in freshwater water quality and/or sediment quality	• See Freshwater Water Quality and Freshwater Sediment Quality.		None predicted	Not Significant -	
	Fish community: Arctic Grayling	• Direct mortality and population abundance	• DFO’s Measures to Protect Fish and Fish Habitat. • Restricted Activity Timing Windows. • Screening water intakes and discharge pipes to avoid entrainment or impingement of fish. • Noise and vibration thresholds for blasting activities.	• There has been no alteration or loss of fish or fish habitat nor a <i>Fisheries Act</i> Authorization granted for predicted effects on fish and fish habitat by the Project. A monitoring program will be approved during the <i>Fisheries Act</i> Authorization process. • No culverts have been constructed. A DFO request for review will be completed prior to any culvert construction on fish bearing waters outlining mitigation and monitoring requirements.	None predicted	Not Significant -	• Hope Bay Project Noise Abatement and Monitoring Plan (TMAC 2018d) • DFO’s Measures to Protect Fish and Fish Habitat: https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
		• Changes in freshwater water quality and/or sediment quality	• See Freshwater Water Quality and Freshwater Sediment Quality.		None predicted	Not Significant -	
	Fish community: Lake Trout	• Direct mortality and population abundance	• DFO’s Measures to Protect Fish and Fish Habitat. • Restricted Activity Timing Windows. • Screening water intakes and discharge pipes to avoid entrainment or impingement of fish. • Noise and vibration thresholds for blasting activities.	• There has been no alteration or loss of fish or fish habitat nor a <i>Fisheries Act</i> Authorization granted for predicted effects on fish and fish habitat by the Project. A monitoring program will be approved during the <i>Fisheries Act</i> Authorization process. • No culverts have been constructed. A DFO request for review will be completed prior to any culvert construction on fish bearing waters outlining mitigation and monitoring requirements.	None predicted	Not Significant -	• Hope Bay Project Noise Abatement and Monitoring Plan (TMAC 2018d) • DFO’s Measures to Protect Fish and Fish Habitat: https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
		• Changes in freshwater water quality and/or sediment quality	• See Freshwater Water Quality and Freshwater Sediment Quality.		None predicted	Not Significant -	

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Freshwater Fish (cont'd)	Fish community: Arctic Char (freshwater life history)	<ul style="list-style-type: none">• Direct mortality and population abundance	<ul style="list-style-type: none">• DFO's Measures to Protect Fish and Fish Habitat.• Restricted Activity Timing Windows.• Screening water intakes and discharge pipes to avoid entrainment or impingement of fish.• Noise and vibration thresholds for blasting activities.	<ul style="list-style-type: none">• There has been no alteration or loss of fish or fish habitat nor a <i>Fisheries Act</i> Authorization granted for predicted effects on fish and fish habitat by the Project. A monitoring program will be approved during the <i>Fisheries Act</i> Authorization process.• No culverts have been constructed. A DFO request for review will be completed prior to any culvert construction on fish bearing waters outlining mitigation and monitoring requirements.	None predicted	Not Significant -	<ul style="list-style-type: none">• Hope Bay Project Noise Abatement and Monitoring Plan (TMAC 2018d)• DFO's Measures to Protect Fish and Fish Habitat https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
		<ul style="list-style-type: none">• Changes in freshwater water quality and/or sediment quality	<ul style="list-style-type: none">• See Freshwater Water Quality and Freshwater Sediment Quality.		None predicted	Not Significant	
	Fish community: Cisco/ Whitefish (freshwater life histories)	<ul style="list-style-type: none">• Direct mortality and population abundance	<ul style="list-style-type: none">• DFO's Measures to Protect Fish and Fish Habitat.• Restricted Activity Timing Windows.• Screening water intakes and discharge pipes to avoid entrainment or impingement of fish.• Noise and vibration thresholds for blasting activities.	<ul style="list-style-type: none">• There has been no alteration or loss of fish or fish habitat nor a <i>Fisheries Act</i> Authorization granted for predicted effects on fish and fish habitat by the Project. A monitoring program will be approved during the <i>Fisheries Act</i> Authorization process.• No culverts have been constructed. A DFO request for review will be completed prior to any culvert construction on fish bearing waters outlining mitigation and monitoring requirements.	None predicted	Not Significant -	<ul style="list-style-type: none">• Hope Bay Project Noise Abatement and Monitoring Plan (TMAC 2018d)• DFO's Measures to Protect Fish and Fish Habitat https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
		<ul style="list-style-type: none">• Changes in freshwater water quality and/or sediment quality	<ul style="list-style-type: none">• See Freshwater Water Quality and Freshwater Sediment Quality.		None predicted	Not Significant -	
Marine Water Quality	Marine water quality	<ul style="list-style-type: none">• Marine resupply (i.e., sealifts)• Site Preparation, Construction, and Decommissioning• Site Contact Water• Fuels, Oils, and PAH• Discharge• Dust Deposition	<ul style="list-style-type: none">• Use existing infrastructure for Doris Project and minimize footprint of Madrid-Boston infrastructure.• Build on competent bedrock and use geochemically stable rock for roads, pads, and structures.• Discharge TIA to Roberts Bay mainly during open-water season.• Discharge buoyant TIA and groundwater to Roberts Bay.• Adhere to Federal and Territorial standards for emissions, in-water works including DFO authorization, explosives, and receiving water criteria.• Follow BMPs outlined in site management plans.• Implement sediment and erosion control measures to reduce over-land water flow and direct water to management structures.• Monitor marine environment through Metal Mining Effluent Regulations and Environmental Effects Monitoring therein.• Follow mitigation, management, monitoring procedures as outlined in Fisheries Authorizations and permits.• Store fuels and petroleum in secondary containment systems with appropriate spill contingencies in place.• Regular inspections of management structures.	<ul style="list-style-type: none">• Baseline marine water quality data were collected in April 2018, at ten sites within Roberts Bay (six near-field sampling sites and four far-field reference sites) to supplement data collected in 2016 and 2017.• MDMER Environment Effects Monitoring program will be established in Roberts Bay in 2020 to assess the effects of effluent discharge on marine water quality.	<ul style="list-style-type: none">• Site Preparation, Construction, and Decommissioning.• Site Contact Water.• Discharge.	Not Significant	<ul style="list-style-type: none">• Doris Project: 2016 to 2018 Roberts Bay Oceanography and Marine Fisheries Baseline Report (ERM 2018d)

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Marine Sediment Quality	Marine sediment quality	<ul style="list-style-type: none">ShippingSite Preparation, Construction, and DecommissioningSite Contact WaterFuels, Oils, and PAHDischargeDust Deposition	<ul style="list-style-type: none">Same as Marine Water Quality.	<ul style="list-style-type: none">No additional marine sediment quality baseline data were collected in 2018, as sufficient baseline data were collected in 2016 and 2017.Marine sediment quality monitoring and reporting will be informed by MDMER Environmental Effects Monitoring	<ul style="list-style-type: none">ShippingSite Preparation, Construction, and Decommissioning.	Not Significant	<ul style="list-style-type: none">Doris Project: 2016 to 2018 Roberts Bay Oceanography and Marine Fisheries Baseline Report (ERM 2018d)
Marine Fish	Fish Habitat	<ul style="list-style-type: none">Habitat loss or alteration	<ul style="list-style-type: none">DFO’s Measures to Protect Fish and Fish Habitat.In-water infrastructure incorporates self-offsetting design considerations by including the use of large, three-dimensional substrates where feasible, and avoids critical marine fish habitat.Restricted Activity Timing Windows.Management plans including Environmental Protection Plan.Fisheries offsetting measures as deemed necessary and approved by DFO.	<ul style="list-style-type: none">Marine fish habitat monitoring did not occur in 2019.	None predicted	-Not Significant	N/A
		<ul style="list-style-type: none">Changes to marine water quality and marine sediment quality	<ul style="list-style-type: none">Use of vibratory hammer during dock construction.Minimize vessel speeds in Roberts Bay.See Marine Water Quality and Marine Sediment Quality.		None predicted	Not significant	<ul style="list-style-type: none">Hope Bay Project Noise Abatement and Monitoring Plan (TMAC 2018d)DFO’s Measures to Protect Fish and Fish Habitat https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
	Fish community: Arctic Char (anadromous life history)	<ul style="list-style-type: none">Direct mortality and population abundance	<ul style="list-style-type: none">DFO’s Measures to Protect Fish and Fish Habitat.Blasting and noise thresholds and associated monitoring.Site management plans including Environmental Protection Plan.	<ul style="list-style-type: none">Marine fish community monitoring did not occur in 2019.	None predicted	Not significant	<ul style="list-style-type: none">Hope Bay Project Noise Abatement and Monitoring Plan (TMAC 2018d)DFO’s Measures to Protect Fish and Fish Habitat https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
		<ul style="list-style-type: none">Changes to marine water quality and marine sediment quality	<ul style="list-style-type: none">See Marine Water Quality and Marine Sediment Quality.		None predicted	Not significant	<ul style="list-style-type: none">DFO’s Measures to Protect Fish and Fish Habitat https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
	Fish community: Saffron Cod	<ul style="list-style-type: none">Direct mortality and population abundance	<ul style="list-style-type: none">DFO’s Measures to Protect Fish and Fish Habitat.Blasting and noise thresholds and associated monitoring.Site management plans including Environmental Protection Plan.	<ul style="list-style-type: none">Marine fish community monitoring did not occur in 2019.	None predicted	Not significant -	<ul style="list-style-type: none">Hope Bay Project Noise Abatement and Monitoring Plan (TMAC 2018d)DFO’s Measures to Protect Fish and Fish Habitat https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html
		<ul style="list-style-type: none">Change in marine water quality and marine sediment quality	<ul style="list-style-type: none">See Marine Water Quality and Marine Sediment Quality.			Not significant	<ul style="list-style-type: none">DFO’s Measures to Protect Fish and Fish Habitat https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Marine Wildlife	Ringed seal	• Habitat loss	• Infrastructure design minimized footprint in marine habitat and avoided marine mammal haul-outs.	• The dock at Roberts Bay was not constructed in 2019 and no monitoring for marine mammals was conducted.	None predicted	Not significant	• Section 3.12 Marine Mammals Hope Bay: 2019 Wildlife Mitigation and Monitoring Plan Compliance Report (ERM 2020a)
		• Disturbance	• Marine Mammal Observer Program in 200 m zone.		None predicted	Not significant	
			• Stop pile driving if marine mammals inside zone.				
			• Use of vibratory pile driving instead of impact pile driving where possible.				
			• Acoustic monitoring of pile driving activity.				
			• Establish underwater noise thresholds for piling activities with additional measures triggered if thresholds exceeded.				
		• Direct mortality	• Establish Soft Start Procedures for pile driving.				
			• Speed limit on the Roberts Bay facility in case ringed seals haul out.		None predicted	Not significant	
			• Wastes managed to avoid introduction to marine environment.				
	Marine birds	• Habitat loss	• Infrastructure design minimized footprint in marine habitat.	• Marine wildlife monitoring did not occur in 2019.	None predicted	Not significant	N/A
		• Disturbance	• Vessels will avoid the large marine bird colony on Prince Leopold Island by 25 km, vessel safety permitting.		None predicted	Not significant	
			• Vessels will avoid known bird colonies by at least 500 m, vessel safety permitting.				
			• Vessels will monitor for large groups of marine birds and avoid, vessel safety permitting.				
		• Direct mortality	• Ships will avoid the large marine bird colony on Prince Leopold Island by 25 km, vessel safety permitting.		None predicted	Not significant	
			• Ships will avoid other marine bird colonies by 500 m, safety permitted.				
			• Airstrips monitored prior to take-off and landings.				
			• Speed limits on Project roads.				
			• Wildlife given the right-of-way on all roads.				
			• Management practices will be used to manage fuels, hazardous materials to prevent spills, and to contain and clean up spills to the marine environment.				

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Archaeology	Archaeological sites	• Loss of recorded archaeological sites	<ul style="list-style-type: none">Detailed recording of surface site content.Consideration of avoidance during project design.Consideration of protection strategies.Periodic monitoring of specific sites.Orientation of field personnel.Implementation of operational procedures.	<ul style="list-style-type: none">No additional sites were affected by construction or operations activities.2019 field program included ground surveys of proposed exploration zones and Madrid-Boston AWR route; revisiting previously recorded sites in these areas to confirm locations; completion of mitigation of NaNh-100; and detailed assessment and plan mapping of eight sites potentially to be affected by development in the near future.22 archaeological sites were newly recorded in 2019.21 years of investigations completed up to and including 2019 have resulted in the recording of 332 archaeological sites, 32 of which were mitigated due to various project related potential disturbances over the years.	• Effect on recorded archaeological sites.	Not Significant	• Hope Bay Project, Nunavut: Archaeological Investigation in 2019 Final Permit Report (Points West Heritage Consulting 2020)
		• Loss of unrecorded archaeological sites	<ul style="list-style-type: none">Surveys before disturbance.Research of TK and other data bases of past cultural information.Surveillance during short term disturbance activities in high archaeological potential areas.Orientation of field personnel.Implementation of operational procedures.		• Effect on unrecorded archaeological sites.	Not Significant	
		• Effect on cultural information content of sites	<ul style="list-style-type: none">Research of TK and other data bases of past cultural information.Orientation of field personnel.Recovery of cultural information from sites that cannot be avoided.Preservation of collected data in museum.		• Gain of cultural information content of sites	Not Significant	
Socio-Economics	Economic Development	• Changes to economic growth	<ul style="list-style-type: none">Monetary contributions to Inuit associations as defined by the new Framework Agreement and IIBA with the KIA.	<ul style="list-style-type: none">TMAC made payments of \$10.8 million to the KIA, NTI and the Kitikmeot Corporation to promote the social, economic, and cultural well-being of Inuit in Nunavut.TMAC made direct payments of \$1.6 million in various taxes to the GN; additional benefits were from the purchase of diesel fuel by the Project, with tax paid at the wholesale level.	None predicted	Not significant	• Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)
	Contracting and Business Opportunities	• Changes to local business growth	<ul style="list-style-type: none">IIBA with provisions for promotion of Inuit content in procurement, including requirement to engage Kitikmeot Qualified Businesses and establishment, under certain conditions, of a Business Development Fund.TMAC Liaison to help maximize Kitikmeot Qualified Business procurement by identifying businesses interested in procurement opportunities.Provide assistance, feedback, information and lead time to contractors from the Kitikmeot communities on bids and bidding policies.Require and monitor local content plans on large bids.Provide annual business opportunities forecast.Promote awareness of procurement opportunities within the Kitikmeot Region.	<ul style="list-style-type: none">The Project has made significant positive contributions to the Kitikmeot and Nunavut economy.TMAC awarded \$91.5 million in contracts to Nunavut businesses, all with Kitikmeot Qualified Businesses (KQB) as defined under the Hope Bay IIBA. The total number of contracts was 19, with an average value of \$4.8 million. An estimated 45% of the total value of contracts awarded by TMAC was awarded to Nunavut businesses in 2019.In 2019, there were 68 registered Inuit Firms in the Kitikmeot region of which 26 were KQB. Many businesses in the Kitikmeot region provide mining services. The development of these businesses may have been supported by the Project or by other mining projects and exploration in the region.	None predicted	Not significant	• Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)

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Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Socio-Economics (cont'd)	Employment	<ul style="list-style-type: none">Changes to employment opportunities and incomeChanges to labour force capacityCompetition for local labour	<ul style="list-style-type: none">IIBA with provisions for annual Inuit employment targets, first opportunity to resident Kitikmeot Inuit for employment, followed by non-resident Inuit.Build cultural awareness and understanding of harassment policies.Promote awareness of employment opportunities within Kitikmeot communities.Develop and implement a Human Resource Strategy.Develop and implement a Workforce Transition Plan for Closure.	<ul style="list-style-type: none">The total number of workers reached a high of 760 in 2019. Total workforce effort in 2019 totalled 1,333,392 hours.In 2019, there were as many as 63 Kitikmeot Inuit working at the Project, as well as an additional 15 Inuit from outside of the Kitikmeot region. As measured by workforce effort (total hours worked), Inuit employment at the Project represented about 10% of the total.In 2019, women comprised about 11% of the total workforce (by hours worked), representing an increase in participation over previous years. Workforce effort by Inuit women was 41,388 hours, or 3% of total workforce effort.Significant direct benefits have been realized to Kitikmeot personal incomes as a result of the Project.For 2019, the total payroll for Inuit TMAC employees (excluding contractors) is estimated at \$2.5 million, representing an increase of \$0.6 million over 2018 earnings.Employee turnover rate for Project employees increased in 2019 (29% for all employees, and 39% for Inuit employees).There was only one lost time incident in 2019 and 76 minor injuries. TMAC is committed to avoiding workplace accidents, and all lost time incidences are investigated and corrective actions identified and implemented. The company promotes a Zero Harm culture as it believes that all injuries and accidents are preventable.In 2019, TMAC provided 158 hours of general training to Inuit workers, 458 hours of health & safety related training, and 7,754 hours of work-related training.Two apprenticeship positions have been created thus far. Efforts have been hampered due to the challenges registering apprenticeships in other jurisdictions when the apprenticeship is not able to be registered in Nunavut.Inuit employees held a mix of unskilled, semi-skilled and skilled positions, while being underrepresented in professional and management positions. In 2018 and 2019, most Inuit workers were in site operations and site services, and to a lesser degree in exploration and environment.	<ul style="list-style-type: none">Changes to employment opportunities and income.Competition for local labour.	Not Significant	<ul style="list-style-type: none">Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)

(continued)

Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Socio-Economics (cont'd)	Employment (cont'd)			<ul style="list-style-type: none">In 2019, of 35 Inuit recruited by TMAC: 12 Inuit hires were employed in different roles at the time of being hired by TMAC - 3 worked for local coop retail while 9 worked in roles within local Hamlets; and 2 Inuit hires were enrolled in Nunavut Arctic College programming (i.e., Adult Basic Education); the remaining were previously unemployed.			
	Education and Training	<ul style="list-style-type: none">Changes to the demand for education and training programsChanges in perceptions of education and employment	<ul style="list-style-type: none">IIBA with provisions for annual and long-term Inuit training targets, and establishment and administration of a Training and Education Fund.Collaborate with the KIA, government and training organizations.Development of a Human Resource Strategy that addresses training and education.Career Development Plans for Inuit employees.Community Information and Career Awareness Sessions in the Kitikmeot.	<ul style="list-style-type: none">TMAC spent an estimated \$40,000 to support school-based initiatives including Career Awareness Sessions, High School Awards, and Mining Matters events.TMAC provided five Career Awareness Sessions (one in each Kitikmeot community); two high school-specific career awareness presentations (one in Kugluktuk and one in Cambridge Bay); ten High School Achievement Awards (two in each Kitikmeot community); one Cross Cultural and Life at Camp presentation to Diamond Driller training class in Cambridge Bay (attended by 10 students); and one site visit tour to high school students (attended by 13 students).High school enrollment remained relatively stable in the Kitikmeot region in 2017. High school completion in 2017 increased in Gjoa Haven and Kugluktuk, remained the same in Cambridge Bay, and decreased in Kugaaruk and Taloyoak; information for 2018 and 2019 was not available at the time of writing this report.	None predicted	Not significant	<ul style="list-style-type: none">Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)
	Migration, Housing, and Infrastructure and Services	<ul style="list-style-type: none">In-migration to the Kitikmeot RegionChanges to the demand for housingChanges to the demand for local services	<ul style="list-style-type: none">Multiple points of hire and transportation for Inuit employees, who are residents of Kitikmeot communities, to and from the point of hire and the Project site.Ongoing engagement with communities as defined by the Community Involvement Plan.	<ul style="list-style-type: none">In 2019, three TMAC employees moved to Edmonton (originally residing in Kugluktuk, Arviat and Cambridge Bay); of that, one employee who initially moved from Cambridge Bay to Edmonton subsequently returned to Cambridge Bay. Although there were no TMAC employees who moved to the Kitikmeot from elsewhere, one employee moved within the region from Kugluktuk to Cambridge Bay. The Project does not appear to be a driver for population growth.The number of people on public housing waitlist increased in Gjoa Haven, Kugaaruk and Taloyoak; there was no change in Kugluktuk; and one less person on the waiting list in Cambridge Bay. The number of people waiting for public housing exceeded the number of available public housing. Housing status of Project employees is unknown; the housing status survey is to be developed in the coming years, to be led by the Nunavut Housing Corporation. It is unlikely that the Project has contributed to increased demand for public housing.	None predicted	Not significant	<ul style="list-style-type: none">Hope Bay Project: 2019 Socio-Economic Monitoring Program (ERM 2020b)

(continued)

Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (continued)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Socio-Economics (cont'd)	Migration, Housing, and Infrastructure and Services (cont'd)			<ul style="list-style-type: none">• There is no evidence that the Project has resulted in an increased demand on health care services from residents of the Kitikmeot region. The rates of utilization remain lower in comparison to the time prior to the Project (e.g., in 2003 or 2004). At the time of writing, community utilization data for 2017, 2018, and 2019 have yet to be released by the GN.• In 2018 and 2019, there was no use of community emergency medical services, compared to one incident in 2017. The Project has not resulted in an increased demand on health care services in Kitikmeot communities as a result of Project-related emergencies.• There is no indication that overall crime rates have increased as a result of the Project. A direct correlation between changes in Project-related employment and income, and changes in the demand for police services and crime in the Kitikmeot communities is not evident. Although the number of police calls was higher in 2016, 2017, 2018, and 2019 and there was an overall increase in crime in 2016 and 2017 (data for 2018 and 2019 is not available), on a per capita basis, those rates fall within previously recorded levels.• The number of social assistance cases slightly decreased in 2018; information for 2019 was not available at the time of writing this report.			

(continued)

Table 8-2. Summary of Madrid-Boston Residual Effects, and Monitoring Program under Project Certificate No. 009 (completed)

Subject Area	Value Component	Potential Effect(s)	Mitigation Measures	Monitoring Results	Predicted Residual Effect(s)	Significance Rating	Reference/Commentary
Socio-Economics (cont'd)	Community Health and Well-being	<ul style="list-style-type: none">• Changes to family stability• Changes to family spending• Changes to food security and cost of living	<ul style="list-style-type: none">• IIBA with provisions for Employee and Family Assistance Program (EFAP); serving country foods on site; maintaining a drug and alcohol policy which includes “zero tolerance”; providing on-site access to communications facilities to allow communication between Inuit employees and their spouses and families; and providing country food kitchens and cultural activities at the Project as determined by the Implementation Committee.• TMAC Liaison to identify employee counselling needs as appropriate; develop on-going consultation with Inuit employees to identify their needs, issues and concerns; and assist in identifying and developing wellness initiatives.	<ul style="list-style-type: none">• In 2019, four Inuit employees voluntarily left TMAC. Reasons for leaving included family commitments (3) and seeking promotion in another job (1). TMAC will continue to implement the mitigation and management measures outlined in the IIBA to address this issue.• An EFAP was established in 2014 and continues to be available to TMAC employees. Between October 2017 and September 2018, there were 14 new counselling and life smart coaching cases, representing an increase in use compared with data for the previous year (when a total of 1.5 persons [standardized measure] accessed the service). Information for 2019 is not available.• The small number of resignations due to family commitments (three) indicates that negative impacts on the ability of Inuit workers to balance employment and family has not become a significant issue of concern. An EFAP continues to be available to and accessed by employees every year to help TMAC employees deal with personal challenges.• By community based on 2017 data, while criminal violations increased in some communities, they decreased in others. There is also substantial inter-annual variation in the number of violations. Information for 2018 and 2019 was not available at the time of writing this report.• In 2018, country foods were served to Project employees up to 20 times; information for 2019 is not available. Inuit workers regularly utilize the Country Food Kitchen on site.	<ul style="list-style-type: none">• Changes to family stability.• Changes to family spending.	Not significant	<ul style="list-style-type: none">• Hope Bay Project: 2019 Socio-Economic Monitoring (ERM 2020b)

9. Geotechnical Inspection Reports

2019 annual geotechnical inspections required under TMAC's Water Licences include the Boston Advanced Exploration Project, the Doris Project and the Tailings Impoundment Area (TIA). The Boston Advanced Exploration Project is an annual requirement in response to Part D, Item 13 of TMAC's Water Licence 2BB-BOS1727 issued by the Nunavut Water Board (NWB) on July 26, 2017. The 2019 Doris Project Annual Geotechnical Inspection is an annual requirement in response to Part I, Items 9 and 10 of TMAC's Water Licence 2AM-DOH1335 - Amendment #2. The objective of these geotechnical inspections is to ensure that the project's surface infrastructure is performing as intended from a geotechnical perspective and in the context of the project site, the emphasis is to a large extent ensuring permafrost integrity.

The Boston Advanced Exploration Project, Doris Project and the TIA annual geotechnical reports are submitted in association with the annual Nunavut Water Board report every year. A copy of the Hope Bay Project 2019 Nunavut Water Board Report, and any associated submissions, is available on the Nunavut Water Board public registry.

10. Management Plans

Table 10-1 provides an overview of all Management Plans for the Hope Bay Project.

Table 10-1. Hope Bay Project Management Plans

Topic	Management Plans	Revision Date
Environmental Management System	Hope Bay Project Environmental Management System	Dec-17
Management Plans		
Emergency Response	Hope Bay Project Emergency Response Plan	Mar-20
Spill Contingency	Hope Bay Project Spill Contingency Plan	Mar-20
Hazardous Waste Management Plan	Hope Bay Project Hazardous Waste Management Plan	Mar-20
Incinerator Management Plan	Hope Bay Project Incinerator Management Plan	Mar-19
De-icing Management	Hope Bay Project Aircraft De-icing Management Plan	Mar-19
QA/QC	Hope Bay Project Quality Assurance Quality Control Plan	Mar-20
Shipping Management	Hope Bay Project Shipping Management Plan	Apr-20
Water Management	Hope Bay Project Doris-Madrid Water Management Plan	Mar-20
	Hope Bay Project Boston Water Management Plan	Dec-17
	Hope Bay Project Water and Ore/Waste Rock Management Plan for Boston Site	Jan-17
Waste Rock Management Plan	Hope Bay Project Waste Rock, Ore and Mine Backfill Management Plan	Mar-19
	Hope Bay Project Water and Ore/Waste Rock Management Plan for Boston Site	
Landfarm Management	Hope Bay Project Hydrocarbon Contaminated Material Management Plan	Jan-17
Air Quality	Air Quality Management Plan, Hope Bay Project	Dec-17
Domestic Waste Water Management	Hope Bay Project Domestic Wastewater Treatment Management Plan	Apr-19
	Boston Sewage Treatment Operations and Maintenance Management Plan	Dec-17
WMMP	Doris North Project Wildlife Mitigation and Monitoring Plan	Sep-17
	Wildlife Mitigation and Monitoring Plan	Dec-16
AEMP	Hope Bay Project Aquatic Effects Monitoring Plan	Dec-19
Ground Water Management Plan	Hope Bay Project Ground Water Management Plan	Apr-18
Tailing Management Plan	Hope Bay Project, Phase2 Doris Tailings Impoundment Area - Operations, Maintenance, and Surveillance Manual	Mar-20
	Hope Bay Project Boston Tailings Management Area - Operations, Maintenance, and Surveillance Manual	Dec-17
Non-Hazardous Waste	Hope Bay Project Non-hazardous Waste Management Plan	Dec-17
Quarry Management	Hope Bay Project Quarry Management and Monitoring Plan	Dec-17
Explosives	Hope Bay Project Explosives Management Plan	Nov-17

(continued)

Table 10-1. Hope Bay Project Management Plans (completed)

Topic	Management Plans	Revision Date
Management Plans (cont'd)		
Closure	Hope Bay Project Doris-Madrid Closure and Reclamation Plan	Nov-17
	Hope Bay Project Boston Conceptual Closure and Reclamation Plan	Nov-17
	Hope Bay Project Windy Camp and Patch Lake Facility Updated Closure Plan (SRK)	May-14
	Hope Bay Project: Madrid Advanced Exploration Program: Conceptual Closure and Reclamation Plan (SRK)	Oct-14
OPEP	Oil Pollution and Emergency Preparedness Plan	Aug-19
Socio-Economic Management Plans		
Health and Safety	Hope Bay Health and Safety Management Plan	Dec-17
Human Resources	Hope Bay Project Human Resources Plan	Sep-16
Community Involvement	Hope Bay Project Community Involvement Plan	Dec-16
Cultural Heritage	Cultural Heritage and Natural Resources Management Plan	Dec-17

Management plans for Project activities were developed pursuant the following certificates, licences, authorizations, and legislation:

- NIRB Project Certificate No. 003, authorizing the Doris portion of the Project.
- NIRB Project Certificate No. 009, authorizing the Madrid-Boston portion of the Project.
- Type A Water Licence No. 2AM-DOH1335, the primary water licence for the Doris-Madrid portions of the Project.
- Type B Water Licence No. 2BB-BOS1727, the licence covers exploration activities and infrastructure at Boston Camp.
- Type B Water Licence No. 2BE-HOP1222, covers exploration activities and infrastructure at Windy Camp.
- Crown Land Leases issued by CIRNAC for the Jetty and Marine Outfall Berm in Roberts Bay.
- Fisheries Authorizations were issued by DFO between 2007 and 2010 to allow for the installation of a jetty, construction of the TIA dam and Schedule 2 MDMER listing of Tail Lake as a tailings impoundment area.
- Legislation pertaining to oil handling facilities, as follows:
 - *Canada Shipping Act*, 2001, Part 8, Paragraphs 168(1), 168(2), 168(3) and 182(a);
 - Part II of the Response Organizations and Oil Handling Facilities Regulations;
 - Part 2 and 3 of the Vessel Pollution and Dangerous Chemicals Regulations, 2012, including the Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants, 2009;
 - *Canadian Environmental Protection Act*, 1999, Release and Environmental Emergency Notification Regulations, 2018; and
 - Oil Handling Facilities Standards 1995.

11. Closure and Reclamation

11.1 OPERATION AREAS

In 2019, TMAC conducted progressive reclamation on the Doris Crown Pillar Recovery Trench. Reclamation of the Doris Crown Pillar Recovery Trench commenced mid-January of 2019, shortly after mining activities were completed. Backfill and final reclamation activities were completed in May 2019.

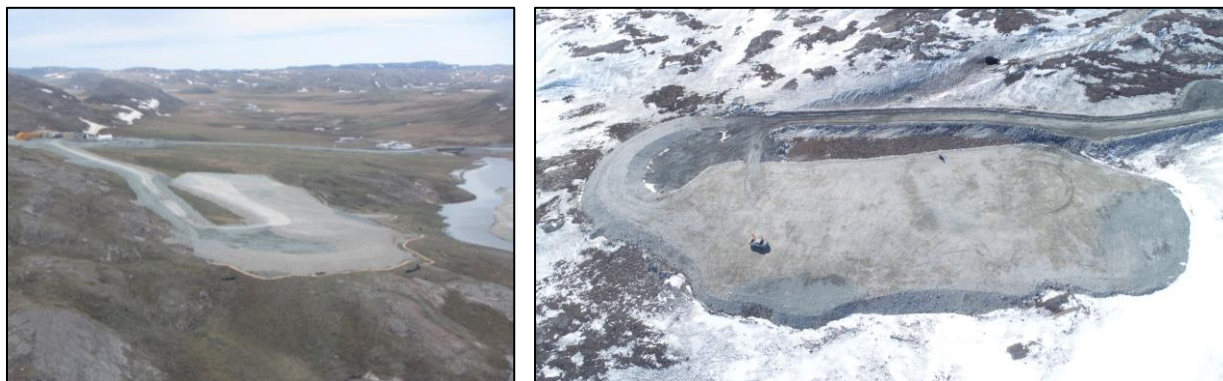
Thermal modelling was conducted by SRK to identify the minimum placement requirements (quantities) to achieve optimal thermal stability of the surrounding overburden, and also identify the maximum allowable elevation of mineralized rock placement within the trench.

Once backfilled, a 1-metre cap of geochemically stable rock was placed. The final cap was designed to promote surface and subsurface flows (contact water) to drain to the underground mine to reduce the extent of surface flows to the environment. The cap was also designed to provide an adequate thermal layer to prevent retrogressive thaw and slumping of the surrounding permafrost.

All sedimentation controls surrounding the Crown Pillar Recovery Trench were removed prior to the onset of winter in 2019.

For aerial photos of the Doris Crown Pillar Recovery Trench post-reclamation activities see Figure 11.1-1.

Figure 11.1-1. Doris Crown Pillar Recovery Trench Post-Reclamation Activities



11.2 EXPLORATION AREAS

Following surface diamond drilling operations, a reclamation process is conducted. Once drill equipment is demobbed from site, all cuttings and drill casings are removed, and the land is leveled with bentonite and capped with peat moss. Following drilling operations on ice, equipment and soiled and/or oily snow and ice are removed from the surface of the lake and deposited in active sumps. Once drilling operations are complete at a drill site, a site closure inspection report is completed by TMAC, reviewed by the site Drilling Supervisor and approved by the TMAC Environment Superintendent. Generalized items inspected in closure review include: water management, drill collar sites and adjacent vegetation inspections and housekeeping. All site closures are photographed with records filed and maintained by TMAC.

No historical drill site reclamation was completed in 2019.

11.3 COST ESTIMATE

The reclamation work for the Hope Bay Project will be done in accordance to approved Closure and Reclamation Plans for the Project. Reclamation progress is monitored through site inspections and annual reporting to the KIA, CIRNAC, and NWB, and is documented in updates of the Project Closure and Reclamation Plan and financial security costs estimates. As part of the Type A Water Licence approval process for Boston-Madrid (Phase 2) Project in 2018, financial security costs estimates were updated and approved by the NWB, KIA, and CIRNAC which consider all existing infrastructure, proposed Phase 2 infrastructure, and any new information available since the last revision. The resulting financial security estimates and their associated Closure and Reclamation Plans, which are applicable to each site, are outlined in the subsections below.

11.3.1 Doris and Madrid

TMAC maintains Hope Bay Project Doris-Madrid Closure and Reclamation Plan (November 2017) which describes the activities, requirements, and monitoring necessary for the closure and reclamation of the Doris site.

As part of the Type A Water Licence approval process for Boston-Madrid (Phase 2) Project in 2018, TMAC provided to the NWB an updated and final Closure and Reclamation cost estimate, which constituted an agreement between TMAC, KIA, and CIRNAC on the financial security parties agreed was required for Doris and Madrid sites. Details of this process can be found on the NWB public registry and resulted in a requirement in Type A Water Licence 2AM-DOH1335 for \$62,058,577 to be posted for the Doris-Madrid portion of the Project; \$51,659,822 to KIA, \$10,398,755 to the Crown. This security is to be posted across nine (9) installments or tranches based on distinct project components.

In addition to the financial security required to be posted for Doris and Madrid under Type A Water Licence 2AM-DOH1335 described above, TMAC also has rights to conduct the Madrid Advanced Exploration Program in accordance with Water Licence No. 2BB-MAE1727 Amendment No.2. In the event TMAC proceeds the Madrid Advanced Exploration Program, and does not commence activities under Type A Water Licence 2AM-DOH1335, TMAC's Conceptual Madrid Closure and Reclamation Plan (2017) will dictate the activities, requirements, and monitoring necessary for the closure and reclamation of the Madrid site(s). In this scenario, TMAC is required to maintain reclamation security in the amount of \$7,131,000 for the work at Madrid. As per the amended licence, this amount is split between activities at Madrid North (\$4,042,000), Madrid South (\$3,072,000) and Madrid North to South All Weather Road (AWR; \$17,000).

11.3.2 Windy

TMAC has an approved Hope Bay Project, Windy Camp and Patch Lake Facility Updated Closure Plan (SRK 2014). This document presents the closure obligations and the plan for closing both facilities, and demonstrates how the closure obligations can be met. A copy of this plan can be found on the NWB public registry.

11.3.3 Boston

For current Boston infrastructure, TMAC has an approved Boston Camp Interim Closure Plan (2014) which was submitted to the NWB May 26, 2014. The plan includes a current closure cost estimate of \$5,988,000. This amount includes cost escalation, management of mineralized rock, reclaiming drill sites and other areas of permafrost degradation, remediation of hydrocarbon contaminated soils, indirect costs, and a contingency. A copy of this plan can be found on the NWB public registry.

For planned Boston infrastructure under the Boston-Madrid (Phase 2) Project, TMAC provided to the NWB an updated and final Closure and Reclamation cost estimate as part of the Type A Water Licence approval process. The updated and final Closure and Reclamation cost estimate provided constituted an agreement between TMAC, KIA, and CIRNAC on the financial security parties agreed was required for the Bostin site. Details of this process can be found on the NWB public registry and resulted in a requirement in Type A Water Licence 2AM-BOS1835 for \$37,458,491 total to be posted; \$9,963,564 to KIA and \$27,494,927 to the Crown. This security is to be posted across nine (6) installments or tranches based on distinct project components.

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