OPERATIONS, MAINTENANCE AND SURVEILLANCE MANUAL: HOPE BAY DORIS TAILINGS IMPOUNDMENT AREA

REVISION 6

HOPE BAY, NUNAVUT

MARCH 2023

Operations, Maintenance and Surveillance Manual: Hope Bay Doris Tailings Impoundment Area

Plain Language Overview:

This Tailings Impoundment Area (TIA) Operation, Maintenance and Surveillance Manual (OMS Manual) is also known as the Tailings Management Plan. This OMS Manual describes how AEM is managing and monitoring the tailings impoundment area, including the impoundment dams, tailings and water pump and pipeline systems. This document describes how tailings deposition will be carried out and demonstrates how AEM will ensure the TIA remains safe. This document should be read in conjunction with the latest North Dam and South Dam monitoring Standard Operating Procedures (SOPs).

Hope Bay, Nunavut

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Revisions

Revision #	Date	Section	Changes Summary	Author	Approver
0	June 2016	Entire Document	Initial Document	SRK	TMAC
1	August 2016	Entire Document	References added	SRK	TMAC
		Section 1.5, Table 3	List updated		
		Section 2.1, Table 4	List updated		
		Section 3.3.5, 3.10	Added contingency pumping for excess mine water		
		Section 3.4.3, Section 3.8, Table 6	Removed optionality of constructing Interim Dike; Added construction timing of Interim Dike		
		Section 4.4	Added approval process for alternate chemical dust suppressants		
		Section 4.5	Reference water management during Care and Maintenance		
		Section 5.3.1	Added Figure 12 pertaining to shoreline protection measures		
		Section 6.4, 6.5.4	Added tailings geochemical monitoring		
		Section 6.5.3	Referenced TIA water quality monitoring		
		Section 7	List updated		
		Figures	Added new Figure 12 and renumbered remaining Figures 13 through 17		
		Appendix A	Included appendix information previously omitted		
2	November 2017	Entire Document	Changes made to account for Phase 2 TIA requirements	SRK	TMAC
3	August 2020	Entire Document	Document format updated. Updates post construction of the Phase 1 South Dam. Report still accounts for Phase 2 requirements. Updates to meet new Mining Association of Canada (MAC) guidelines.	SRK	TMAC
4	February 2022	Entire Document	Updated to include AEM Governance of Critical Infrastructure , change of ownership, TARP levels	AEM	AEM

5	April 2022	Section 3.6	Updated Spillway and Interim Dike section for activities as listed in the Care and Maintenance Plan	AEM	AEM
6	March 2023	Entire Document	Updated structure of document to reflect incorporation into the Dam Safety Management System. Updated the DEP. Linked OMS to ERP Updated contact information. Updated with new TIA infrastructure.	AEM	AEM

Contents

Figures

Useful Definitions

AEM	Agnico Eagle Mines
AEP	annual exceedance probability
ARD	acid rock drainage
CDA	Canadian Dam Association
DSI	dam safety inspection
DSR	dam safety review
EOR	engineer of record
FEIS	final environmental impact statement
FSL	full supply level
GCL	geosynthetic clay liner
IDF	inflow design flood
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
KIA	Kitikmeot Inuit Association
MAAT	mean annual air temperature
MAP	mean annual precipitation
MAR	mean annual runoff
MMDER	Metal and Diamond Mining Effluent Regulations
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
OMS	operations, maintenance and surveillance
PAG	potentially acid generating
PGA	peak ground acceleration
PMF	probable maximum flood
ROQ	run-of-quarry
SOP	standard operating procedures
SRK	SRK Consulting (Canada) Inc.
TIA	tailings impoundment area
TMA	tailings management area
TMS	tailings management system
TMAC	TMAC Resources Inc.
TPD	tonne per day
WAD	weak acid dissociable
WMMP	wildlife monitoring and management plan

1 Introduction

This operations, maintenance, and surveillance (OMS) manual is for the Doris Tailings Impoundment Area (TIA). It was prepared by SRK Consulting (Canada) Inc. and updated by Agnico Eagle Mines Limited (AEM) and in accordance with various water licences held by AEM and associated with developments throughout the Hope Bay region.

Objectives

This manual outlines the framework and procedures AEM and its contractors will use to ensure:

- operation, maintenance, surveillance of the TIA are carried out safely,
- best practices for minimizing potential environmental impacts and liabilities with respect to the Doris TIA are followed, and
- the water licence conditions are met.

Structure

This document is structured to act as one primary document pertaining to the Doris TIA. The goal is that this one document can then be approved and implemented to address the site- and licence-specific operation, maintenance and surveillance needs. It incorporates Industry Standards as well as AEM Corporate Standard and Policy on Tailings and water Management. This document plays a critical role in the Dam Safety Management System at Hope Bay.

Note: In the event of a new water licence or an existing licence amendment, only the portions of this manual pertaining to that licence will need to be revised in this TIA OMS Manual.

Contents

In addition, this manual defines and describes the

- roles and responsibilities of personnel assigned to the TIA;
- procedures and processes for managing change;
- key components of the TIA;
- procedures required to operate, monitor the performance of, and maintain the TIA to ensure that it functions in accordance to its design, meets regulatory and corporate policy obligations, and links to emergency planning and response; and
- requirements for analysis and documentation of the performance of the TIA.

1.1 Managing Updates

When to Update

The procedures required to operate and maintain the TIA can change with time, in response to changes in site conditions or changes to mining operations. Because this manual is a controlled document, it should be thought of as a living document that will be updated to reflect those changes.

Annual Updates

This manual should be reviewed annually as required by the AEM governance policy for critical infrastructure, with input from AEM site staff, and based on recommendations from

- the engineer of record's (EOR)
- The Design Engineer (DE)
- The Hope Bay Independent Review Board (IRB)
- Third party Dam Safety Review (DSR)

Other Update Triggers

Revisions can be triggered by activities such as

- changes in dam classification,
- operational performance,
- personnel or organizational structure,
- mine ownership,
- regulatory or social considerations, and
- life cycle or design philosophy.

Update Procedure

Updates to this OMS manual are carried out annually as follows:

Step	Action
1	The Responsible Person (RP) or an individual designated by the RP is to submit proposed changes to the EOR for review and authorization.
2	If changes are related to TIA design elements as stipulated in Section 3 (specifically 3.10), submit them to the DE for review and approval.
3	The RP is responsible to communicate any changes that are going to be made to this OMS by e-mail to the control copy distribution list; for all areas regardless of if they fall under the 'design' or 'operation' categories.

4	Once approved, incorporate changes into the manual. Revisions to the OMS are to be clearly documented in the revision control table (found at the beginning of this OMS). Once revisions have been made, the updated versions are to be distributed to all parties listed in Section 2.1 and placed on Intelex. Out-of-date materials are to be removed and archived.

Control Copy Locations and Responsibility

Copies of this manual are available at these locations. The latest version is available on Intelex.

Copy Location	Position
Site main office	Mine General Manager
Environmental department	Environmental superintendent (RP)
Site Incident Command Center	H&S superintendent
External	Design Engineer (SRK)
Off Site	Engineer of Record

Digital Control Copy

A digital control version of this OMS (pdf) is uploaded by AEM to the following server location: W:\Environment\Emergency, Spill and WRT Response. The digital version is only controlled at this one online location.

Uncontrolled Copies

Printed or electronic copies of the OMS Manual found at other locations will be considered uncontrolled versions.

1.2 Related Documents

The documents below should be used in conjunction with this manual.

Operating Procedures	• **North Dam Monitoring: Standard Operating Procedures – Revision 4 (2022)** – North Dam Monitoring Standard Operating Procedures (SOP) • **South Dam Monitoring: Standard Operating Procedures – Revision 1 (2022)** – South Dam Monitoring Standard Operating Procedures (SOP)
Emergency Planning	• **Emergency Response Plan (2022)** – Describes Incident Command System and actions relating to all surface emergencies. • **Dam Emergency Plan (2022)** – Describes emergency response related to TIA components • **Trigger Action Response Plans (2022)** – Details trigger values and associated actions for TIA monitoring and monitoring instrumentation
Design Documentation	• **Preliminary Tailings Dam Design (2007)** – North Dam design documentation (SRK 2007) • **North Dam As-Built Report (2012)** – North Dam as-built documentation (SRK 2012) • **Doris TIA – 2022 Interim Dike** – Design report for Interim Dike (SRK 2022b) • **Doris Tailings Impoundment Area Interim Dike Filter Trade-off Study (2016)** – Memo clarifying the purpose of the Interim Dike and a trade-off study of two different filter designs (SRK 2016). Interim dike not part of Phase 2 plans. • **Doris Tailings Management System Phase 2 Design, Hope Bay Project (2017)** – Report documents TMAC's proposed changes to currently permitted TMS to accommodate additional volume of tailings produced as part of Phase 2 development (SRK 2017b) • **Engineering Drawings for the South Dam – Phase 1 (2017)** – South Dam – Phase 1 Issued For Construction Engineering Drawings • **Doris Tailings Management System Phase 2 Design (2017)** – Report overviews the Phase 2 design of the Doris Tailings Management System and Facility (SRK 2017b). • **South Dam Design Report (2019) –** formal documentation for the South Dam design (SRK 2019b) • **South Dam Phase 1 As-Built Report (2019)** – South Dam as-built documentation (SRK 2019a)

Environmental	• **Climate and Hydrological Parameters Summary Report (2017)** – Climate and hydrological parameters and analysis for the Doris and Boston sites (SRK 2017c). An updated climate study was completed in April 2022 (SRK 2022c).
Water Management	• **Doris and Madrid Water Management Plan (2022)** – Describes the water management procedures including discharge from the TIA and associated water quality criteria (AEM 2022a) • **Groundwater Management Plan (2023)** – Describes the groundwater inflow predictions and associated management procedures for handling this water (AEM 2022d) • **Groundwater Inflow and Quality Model (2015)** – Describes results of hydrogeological modeling to estimate the potential quantity and quality of groundwater flow into the mine (SRK 2015c). An informal groundwater inflow audit was completed in 2022 (reporting is currently in progress) • **Site-Wide Water and Load Balance (2022)** – Water and load balance to evaluate water management needs and predict water quality at the Project and downstream receptors (SRK 2022)
Tailings and Waste Management	• **Doris North Project Tailings Management System Design (2015)** – South Dam and Interim Dike design and tailings management plan (SRK 2015a) • **Geochemical Characterization of Tailings from the Doris Deposits and FEIS Characterization (2015)** – Geochemical characterization of the tailings to be deposited into the TIA (SRK 2015b) • **Hope Bay Waste Rock and Ore Management Plan (2022)** – Management plans for waste rock and ore at the Hope Bay project sites (AEM 2022c)

2 Roles and Responsibilities

2.1 Governance and Individual Responsibilities

Agnico Eagle is committed to the protection of the public, the environment and its personnel. The company has developed a governance policy for its critical infrastructure to ensure their management in an appropriate and responsible manner (AEM 2020). The primary elements of the policy are:

- The development of specific roles with specific responsibilities;
- Regular and consistent reporting;
- Accountability at all levels, from operations to corporate;
- The use of Best Available Technology (BAT) and Best Applicable Practices (BAP); and
- The use of a risk-based approach to manage the risks associated with critical infrastructure

The persons responsible for operations, maintenance, surveillance, emergency preparedness, and emergency response along with the governance policy are listed below and in Appendix A, which also provides the site management structure.

Accountable Executive Officer (AEO)	As emphasized by MAC (2019), the accountability for decisions related to tailings management rests with the Owner's Board of Directors or Governance Level. The Board of Directors or Governance Level is expected to designate an Accountable Executive Officer (AEO) for tailings management. More specifically, the following responsibilities are assigned to the AEO: • Needs to be aware of key outcomes of water management risk assessment and of how these risks are being managed • Has accountability and responsibility for putting in place appropriate management structure • Assign responsibility and appropriate budgetary authority for tailings management • Define the personnel duties, responsibility and reporting relationships, supported by job description and organisational charts to implement the tailings management system through all stages in the facility life cycles Provide assurance to AEM and its Community of Interest that tailings are managed responsibly
Mine General Manager	• Identify the scope of work and budget requirement for all aspects of tailings management • Approve budget for operations, maintenance, and surveillance related activity • Establish an organisational structure with Roles and Responsibilities that meets the Governance Standard on Critical Infrastructure

	• Identify and retain a Responsible Person (RP) • Liaise with independent reviewer (IRB) as required
General Superintendents	Ensure the OMS responsibilities delegated to the departments they oversee are carried out as described in this section of the OMS Manual
Engineer of Record (EoR)	The function of EoR is to support AEM in ensuring that mine waste and water management infrastructure are designed and operated properly. The owner, in assuring that these facilities are safe, has the responsibility to identify and retain an EoR, who provides technical direction on behalf of the owner. Having an EoR for mine waste and water infrastructure is recognized as one of the best practices for responsible management of mine waste and water management facilities. In accordance with the AEM Governance Policy for Critical Infrastructure, the EoR is an employee of AEM. The EoR's responsibilities include: • Support and give technical advice to the RP and the AEO on geotechnical and operational challenges • Participate if possible, in Dam Safety Inspections and associated reports for tailings facilities that include retention structures/dams • Verify if the Tailings Impoundment Area (TIA), waste rock storage facility (WRSF), and Water Retaining Infrastructures are designed and are operating in accordance with the best standards in the industry and the AEM corporate standards • Verify if the waste and water management plans are developed and followed to ensure safety of the operation and the business; • Review and provide agreement on the procedural documents related to waste and water management (including OMS, ERP and TARP); • Be available for the Independent Review Board (IRB); • Participate in IRB meetings and assist the RP in their preparation if required; • Participate in the facility's risk assessments; • Be available to participate in dam safety reviews; • Identify other internal or external professionals (such as hydrogeologists, geologists, hydrologists, etc.) to provide their support when required; • Propose a schedule of site visits and required meetings during the course of the year.
Design Engineer (DE)	Engineer Responsible for the design and annual inspection of the facilites. At Hope Bay, the DE plays an important role in the management of critical infrastructure. • Advise on contemplated changes to the structure operation • Advise on structure performance and mitigation work as required

	• Present during independent review board meeting to provide input and context on the structure performance
Responsible Person	The Responsible Person(s) identifies the scope of work and budget requirements (subject to final approval) for all aspects of tailings management, including the Engineer of Record (EoR), and will delegate specific tasks and responsibilities for aspects of tailings management to qualified personnel." The RP is directly responsible for the management of critical infrastructure on a specific site with the objective of compliance with the Governance. The management of critical infrastructure includes design, construction, operation and closure. The RP may delegate specific tasks and responsibilities for aspects of tailings management to qualified personnel (MAC 2017). • Ensure the implementation and sustainability of the Governance model at the site level; • Management of critical infrastructure, as well as appurtenant structures that may affect the critical infrastructure; • The management of personnel, budget and external resources for the critical infrastructure (external resources include the Design Engineer (DE), Independent Review Board (IRB) and any other necessary consultants/contactors); • Close collaboration with the EoR and communication with the Design Engineer and Independent Review Board); • Preparation for, and coordination of, IRB meetings and site visits; • Preparation for, and coordination of, annual geotechnical inspections; • Responding to, and implementation of, the recommendations of the IRB; • Annual review and update of the OMS Manual in collaboration with the EoR; • Continued application of the requirements of the OMS; • In collaboration with the EoR, preparation of an annual report on the status of the critical infrastructure; • Management of all documents and data related to design, construction, operation, closure, surveillance and monitoring in a secure, accessible and permanent manner; • Revise and update the OMS Manual to reflect as-built conditions and any other changes. Review and update the OMS manual into Intelex. Maintain up to date distribution list of the OMS Manual
Site Geotechnical Engineer (EIT)	The Site Geotechnical Engineer (or EIT) is designated by the RP and is responsible for specific tasks and responsibilities for aspects of tailings management that are delegated by the RP. The Site Geotechnical Engineer

works closely with the RP and EOR. At Hope Bay the responsibilities of the Site Geotechnical include:

- Support the implementation and sustainability of the Governance model at the site level;
- Management of critical infrastructure, as well as appurtenant structures that may affect the critical infrastructure;
- Support the management of personnel, budget and external resources for the critical infrastructure (external resources include the Design Engineer (DE), Independent Review Board (IRB) and any other necessary consultants/contactors);
- Close collaboration with the EoR and communication with the Design Engineer and Independent Review Board;
- Preparation for, and coordination of, IRB meetings and site visits;
- Preparation for, and coordination of, annual geotechnical inspections;
- Responding to, and implementation of, the recommendations of the IRB;
- Annual review and update of the OMS Manual in collaboration with the EoR and RP;
- Continued application of the requirements of the OMS;
- In collaboration with the EoR, preparation of an annual report on the status of the critical infrastructure;
- Management of all documents and data related to design, construction, operation, closure, surveillance and monitoring in a secure, accessible and permanent manner;
- Review, revise and update the OMS Manual to reflect as-built conditions and any other changes. Review and update the OMS manual into Intelex. Maintain up to date distribution list of the OMS Manual
- Ensure that maintenance work (predictive, preventive and corrective) is identified and carried out on the earthwork and instrumentation system in collaboration with the Site Services Department
- Ensure the surveillance of the structures as required in the OMS Manual (visual inspection and instrument monitoring) is carried out
- Ensure the maintenance work (predictive, preventive and corrective) on the earthwork and instrumentation system is identified and performed
- Ensure that the surveillance data is reviewed and analyzed to evaluate dike performance with respect to design parameters
- Ensure surveillance of the structures is carried out as required in the OMS Manual (visual inspection and instrument monitoring)

Independent Review Board (IRB)	Independent Review Boards are a mechanism to obtain independent, expert commentary, advice, guidance and where appropriate, recommendations to assist owners/operators in identifying, understanding, and managing risks associated with TSF, WRSF, WSF, HLF and water-retaining infrastructures. The Independent Reviewer(s) does not have decision-making authority. Accountability and responsibility for decisions rests with AEM. • Review mine waste management strategy (including tailings and waste rock storage facilities); • Review water management infrastructure designs and performance (including water retaining infrastructures); • Review on-going construction works and monitoring data; • Comment on implementation progress of proposed mine waste management improvement measures; • Provide opinions and guidance to the operation on the physical integrity, safety, behavior, and performance of the confinement systems for mine waste and water retaining infrastructures; and • Comment on management systems, emergency preparedness and overall management approach of the different mine waste management facilities and water retaining infrastructures.
Process Operations Superintendent	The Process Plant Department is the owner of the process plant. They work in close collaboration with the other stakeholder to ensure the success of tailings management. The Process Plant Superintendent is in charge of the Process Plant and ensure that: • The Process Plant team as sufficient resource (qualified workforce, material, budget, training) to fulfill the OMS obligation defined in this manual • A structure is in place that define the R&R, qualification, training requirement and a staffing strategy to fulfill the obligation of the OMS Manual • The process plant operates and maintains the infrastructure required to produce and transport (i.e pump) the tailings to tailings impoundment area • The process plant tracks the parameters and characteristics of the tailings produced to ensure that targets are reached • The process plant operates the reclaim water system and tracks the water consumption to ensure that targets are reached • The process plant stops the transport of tailings if required in case of upset or emergency condition
Environment Superintendent	The Environment Department ensures compliance with Environment Regulation and the Water License and is the owner of the water & tailings management infrastructures outside of the process plant. They ensure

	reporting and liaison with the NIRB, NWB, NGO's and other government agencies. The Environment Superintendent is in charge of the Environment Department and ensure that: • The Environment team has sufficient resources (qualified workforce, material, budget, training) to fulfill the OMS obligations defined in this manual • A structure is in place that defines the R&R, qualification, training requirement and a staffing strategy to fulfill the obligation of the OMS Manual • Environment review monitoring data for compliance with Water License and regulations and to determine dike performance with respect to design parameters • Support the Site Geotechnical Engineer
Site Services Superintendent or designate	The Site Services Department has the workforce and equipment to manage road, electricity and dewatering at the Hope Bay Site. They fulfill the planning done in collaboration with the Environment team to ensure the fulfilment of the OMS requirement. The Maintenance Superintendent is in charge of the Site Services Department and ensure that: • The Site Services team has sufficient resources (qualified workforce, material, budget, training) to fulfill the OMS obligation defined in this manual • A structure is in place that defines the R&R, qualification, training requirement and a staffing strategy to fulfill the obligation of the OMS Manual • Site Services maintain access to the structure and tailings management systems. This include making road repairs, controlling dust and managing snow and water. • Site Services install, operate, maintain and monitor all the components of pumps and piping system associated with water management. They also perform operation, maintenance and surveillance work on the piping system. This work is planned in collaboration with the Environment Department. • Update and maintain a list of operational pumping equipment • Install, operate, maintain and monitor all the components of pumps and piping system associated with water management. They also perform operation, maintenance and surveillance work on the piping system. The Site Services Department has the workforce and equipment to maintain mobile equipment and pumps. They fulfill maintenance of some of the mechanical equipment component of the dewatering dike as requested by the Site Services department. The Site Services Superintendent is in charge of the Site Services Department and ensure that:

	• Ensure preventive, predictive and corrective maintenance is carried out regularly on pumping equipment related to water management as requested by Site Services • Keep records of maintenance performance on pumping equipment
Health and Safety Superintendent	The Health and Safety Department is responsible to update and manage the site wide emergency response plan. The Health and Safety Superintendent is in charge of the Health and Safety Department and ensure that: • The emergency response plan is updated and is aligned with the OMS manual • The trigger to raise an emergency defined in the OMS manual and the communication pathway to do so is understood and aligned with the ERP

2.2 Contact Information

Environment and Critical Infra VP / Accountable Executive Officer	Michel Julien |michel.julien@agnicoeagle.com 416-947-1212 x3738 514-244-5876
Engineer of Record (EoR) / Technical Specialist, Environmental Management	Thomas Lepine | thomas.lepine@agnicoeagle.com 418-473-8077
Design Engineer	John Kurylo | jkurylo@skr.com 604-235-8541
Site Geotechnical Engineer	Brennan Jay| brennan.jay@agnicoeagle.com 867-988-6882 x 4600122
Independent Review Board	Bill Horne | bill.horne61@gmail.com Henri Sangam | henri.sangam@geomino.com
Mine General Manager	Eric Steinmetzer | eric.steinmetzer@agnicoeagle.com 867-988-6882 x 4600104 819-763-0187
Lab & metallurgy Superintendent (currently inactive)	TBD 867-988-6882 x 4600101

General Superintendent - Mining	Philemon Desrochers-Gagnon | philemon.desrochers@agnicoeagle.com 867-988-6882 x4600106 819-355-0815 Philippe Lapointe | philippe.lapointe@agnicoeagle.com 867-988-6882 x4600106 819-860-2898
Environment Superintendent (Responsible Person)	Nancy Duquet-Harvey | nancy.harvey@agnicoeagle.com 867-988-6882 x4600102 819-856-4385
Maintenance General Supervisor (Dewatering Superintendent)	Cody Kerr | cody.kerr@agnicoeagle.com 867-988-6882 x4600131
Health and Safety Superintendent	Jake Murdoch | jake.murdoch@agnicoeagle.com 867-988-6882 x4600123

2.3 Communications, Reporting and Tracking

Communication Procedures	It is extremely important that monitoring and management policies are communicated to all interested parties involved with the maintenance and surveillance of the site. The Responsible Person must ensure that all the issues, concerns, or incidents are reported promptly. The Responsible Person must ensure clear, concise, and consistent communication so that emergency preparedness and response plans are effective, and the public is kept aware of possible hazards associated with the site, of its maintenance, and of its surveillance programs.
Documentation	The surveillance and inspection reports should be prepared under the supervision of the Environmental Superintendent and reviewed by a qualified person. After being reviewed, records of all surveillance and inspection activities should be kept on file for future reference.
General Guidance	See Section 1.1 for additional details on the 'Control Copy Locations and Responsibility' for the OMS manual.
Document Control	All reports of activities completed on site must be submitted to the Responsible Person who will then notify the EOR and specialist consultants if further assessments are required. It is AEMs responsibility to ensure the

following documents are securely stored and accessible to personnel involved in implementing requirements found in this OMS Manual:

- As-built documentation related to the site
- Records of all maintenance activities
- Previous site inspection summary reports
- Record of staff training
- Relevant incident reports

OMS Reporting and Tracking

Observations made during general and geotechnical inspections must be recorded in field books or on digital tablets or computers. For hardcopy documents, digital scans of the used pages of the field books should be made for safekeeping. Copies of field notes or field books should be stored at a designated location when not in use.

It is the responsibility of:

- Any personnel visiting the site to report any observed issues that require maintenance or repairs to the Responsible Person (by letter or electronic mail), within one day.
- The geotechnical inspector to prepare a memorandum for each geotechnical inspection, describing the observations made during the site visits, as well as any recommendations for maintenance activities to be completed.

Electronic and hard copies of the geotechnical inspections and maintenance events should be submitted to the Responsible Person no longer than 90 days following the completion of the inspection or maintenance event.

The reports must include:

- Tabular summaries of all data generated
- A description of any restoration or reclamation work carried out (or since the previous inspection)
- Results of any studies associated with restoration and reclamation
- A report on any inspection of site
- Any other details requested by the Site Manager or Responsible Person or the EoR.

Tailings Spills and Pipeline Repairs

All tailings line repairs, spills or leaks of any tailings line should be documented and reported to the Responsible Person. This reporting should include:

- A description of the repair or damage
- Photos of the location
- A coordinate (or a figure mark-up) to show the location of the repair or damage

Hard copies of all documents produced in the reporting and tracking process should be stored at the project safe-keeping location. All hard copy documents should be scanned and turned into electronic records at least annually. All electronic documents should be saved on a safe computer or network drive.

2.4 Competencies and Training

Objectives

Relative to carrying out operations, maintenance, and surveillance activities for the TIA, AEM ensures site personnel

- have a clear understanding of and adequate competency for their roles and responsibilities,
- receive appropriate training, and
- are kept abreast of updates to this manual.

Note: Procedures for meeting these objectives follow.

Role-Specific Competencies

AEM works to ensure personnel

- have the tailings management experience specific their job descriptions prior to appointment (especially those identified in Section 2.1);
- participate, if necessary, in training to remedy any deficiencies in competency (such as online tailings management courses offered by Edumine); and
- receive on-the-job training for relevant tasks such as those outlined in appropriate standard operating procedures (SOPs).

Site Orientation

All personnel are required to receive a site orientation that provides them with an understanding of

- the general TIA management principles and
- visual indications of the TIA performance.

On-going OMS Training

AEM develops and requires personnel to attend

- a detailed, annual site-specific TIA orientation and training module based on this manual and
- if necessary, following the dam safety inspection (DSI), a workshop conducted by the geotechnical engineer that focusses on findings of the inspection.

3 Tailings Facility Description

3.1 Project Summary

Location

The Hope Bay Project (the Project), owned and operated by AEM, is found

- 705 km northeast of Yellowknife,
- 153 km southwest of Cambridge Bay in Nunavut Territory, and
- east of Bathurst Inlet (Figure 1).

Mineralization Areas

The Project is a gold mining and milling undertaking that consists of three distinct areas of known mineralization plus extensive exploration potential and targets (Figure 2): Doris, Madrid, and Boston.

Project Phases

Phase 1: Doris Project

- Currently being carried out under an existing water licence
- includes mining and infrastructure

Phase 2: Madrid-Boston Project

- License issued December 2018
- includes mining and infrastructure
- Madrid and Boston located 10 and 60 km due south of Doris, respectively (SRK 2017a)

Processing Methods

Ore processing includes cyanidation and flotation methods, with two separate streams of tailings being produced, both captured under the tailings management system (TMS).

Cyanidation Tailings

Cyanidation tailings are detoxified (cyanide destruction) then filtered and blended with waste rock then returned underground as backfill.

Flotation Tailings

Floatation tailings are produced at the Doris processing facility and deposited in the Doris TIA.

Tailings Deposition

Phase 1

Phase 1 TMS (SRK 2015b) design realizes subaerial deposition of about 2.5 Mt of tailings into the Doris TIA. This area was a natural lake (Tail Lake), which is listed on Schedule 2 of the MDMER.

Phase 2

Phase 2 development expands the TIA to accommodate 18 Mt of tailings (Figure 3).

TIA

To ensure environmental containment, the TIA is impounded through three dams: North Dam, South Dam, and West Dam (Figure 3).

North Dam

- functions as a water retaining dam
- constructed in 2012 (SRK 2012) as a water retaining frozen core dam

South and West Dams

- have tailings deposited against their upstream face to keep the Reclaim Pond away from the structures (Figure 3)
- designed as frozen foundation rock fill dams incorporating a geosynthetic clay liner (GCL)
- Phase 1 of the South Dam was constructed in 2018 (SRK 2019a)

South Dam is part of Phase 1 and will be raised as part of the Phase 2 development. The West Dam is a new structure. As of this version of this OMS, the West Dam was not yet needed for containment, and therefore has not yet been constructed.

TIA Closure Process

The TIA closure procedure has three core stages.

Stage	Description
Isolation Cover	The TIA will be closed by applying a 0.3 m quarry rock isolation cover that • mitigates tailings dust and • prevents tailings contact with terrestrial wildlife.
Water Discharge	Once the cover is applied, water discharge from the TIA must meet environmental discharge criteria, as demonstrated in the water quality modeling (SRK 2017a).
North Dam Breach	When water quality is confirmed, the North Dam will be breached, thus returning the natural outflow to its pre-mining elevation.

3.2 Project History Highlights

Exploration

1964

Work at the Project site began. The first exploration focused on showings at Ida Point, Ida Bay, and Roberts Lake to the north. Three exploration companies continued work until exploration drilling started.

1992

Drilling led to the first site infrastructure at Boston in the form of an exploration camp on the northeastern shores of Aimaokatalok Lake.

1996 -1997

Underground development was carried out at Boston to extract a bulk sample.

1999

Exploration drilling expanded to Madrid and Doris. A new exploration camp was constructed on the eastern shore of Windy Lake.

2006

The project certificate (NIRB No. 003) was obtained to start a mine at Doris.

2007

The water licence (2AM-DOH0713) for Doris was issued.

Construction

2007

Construction began but slowed as the Project transitioned in ownership.

2010

Construction resumed.

2011

Construction of the North Dam starts (until spring)

2012

Construction of the North Dam finished.

The Project was placed in care and maintenance before starting commercial production.

2013

Another ownership change happened, which resulted in recommencement of construction, with planned commercial production scheduled for early 2017.

2016

The water license was amended for the Doris Project (2AM-DOH1323 – Amendment 1).

2018

Construction of Phase 1 of the South Dam

The current water license was amended for the Doris Project (2AM-DOH1335 – Amendment 2).

2019

Ongoing development at the Doris North, as well as the Madrid areas.

2022

The project was placed in care and maintenance following an ownership change.

3.3 Site Conditions

Climate

Mean Annual Air Temperature

For the period 1991 to 2020, the mean annual air temperature is estimated to be

- −11.1°C at the Doris Site

Wind at Doris and Boston

- predominately a west wind direction at Doris and west-northwest at Boston
- highest wind speeds between December to April, with a predominant westerly wind direction (general site trend)
- velocity subsides with a tendency to be on the East-West axis but with no predominant direction otherwise from May to October (site trend)
- westerly in November and December (general site trend)

Precipitation

- rainfall and snowfall
- 97.4 mm mean annual rainfall for both Doris and Boston
- 182.4 mm mean annual snowfall (snow water equivalent, corrected for undercatch)
- 279.5 mm estimated mean annual precipitation (water equivalent)

Lake Evaporation Estimation

- 284 mm/year at Doris
- 291 mm/year at Boston

Reference: (SRK 2017c, SRK 2022d)

Permafrost

The Project is in a region of the Canadian Arctic that is underlain by continuous permafrost with the following parameters:

- 570 m estimated continuous permafrost depth (SRK 2017a)
- −8°C near surface temperature
- 0.5–1.0 m thick typical active layer, depending on surface ground conditions (SRK 2015a)

Regional Geology

Bathurst Block

The Project area is in the faulted Bathurst Block, forming the northeast part of the Slave Structural Province, a geological sub-province of the Canadian Shield.

Archean Hope Bay Greenstone Belt

The region is underlain by the late Archean Hope Bay Greenstone belt that is

- 7-20 km wide,
- more than 80 km long in a north-south direction, and
- made up of mafic meta-volcanic (meta-basalts) and meta-sedimentary rocks that are bound by Archean granite intrusive and gneisses.

Greenstone Package

The Greenstone packages

- was deformed during multiple events and
- is transected by major north-south trending shear zones.

Note: The zones appear to exert a significant control on the occurrence of mineralization, particularly where major flexures are apparent and coincident with anti-forms (SRK 2015a).

Hydrology

The TIA is in a sub-basin of the Doris Lake drainage basin.

- The catchment naturally drains northwest towards Doris Lake.
- Flows are consistent with all drainage basins within the Project area.
- Peak flows occur during freshet.
- The mean annual runoff (MAR) volume from this basin is 640,000 m^3 (SRK 2017a).

Hydrogeology

Groundwater Flow

Groundwater flow in a continuous permafrost environment is limited to shallow seasonal flow that takes place within the active layer and deep groundwater flow that

- takes place below the permafrost and in taliks (permafrost free zones) under larger water bodies and
- has elevated salinity, since the groundwater is ancient trapped seawater (connate water).

Relative to Mining

The Doris Mine will include mining in permafrost, as well as mining in the Doris Lake talik.

- Peak groundwater inflow to the mine is predicted to be 3,000 m^3/day.
- This water will be managed via the TIA and/or direct discharge to the ocean (SRK 2015c, 2017a).

- If predicted mine inflow exceeds 3,000 m^3/day, the excess inflow will be temporarily stored in designated areas of the mine or pumped to the TIA.
- Excess pump capacity will be available to divert excess flow to the TIA (TMAC 2017b).

Talik

The TIA hosts a talik; however, it is not known whether it is an open or closed talik. The permafrost free zone is expected to decrease as tailings freeze-back occurs (SRK 2015a).

3.4 Communities of Interest (COI) Perspectives

The Hope Bay project and corresponding TIA are in a remote area of the Kitikmeot Region; the western part of Nunavut and the central part of the Canadian Arctic. Access to site is done almost entirely via plane but could also be access via boat in the summer or over ice in the winter. Most project impacts in Nunavut are predicated for the Kitikmeot region, that benefits from the location of the Hope Bay project in the region (TMAC 2017d).

As outlined in the Final Environmental Impact Statement (FEIS) (TMAC 2017d) the project development along the Hope Bay Belt cannot be done in isolation. Many partnerships are required and AEM has been supported in its development goals by meaningful partnerships with two major Inuit organizations, Nunavut Tunngavik Inc. (NTI) and the Kitikmeot Inuit Association (KIA). The NTI is the partner organization that coordinates and manages Inuit responsibilities set out in the Nunavut Agreement. NTI holds the surface title and mineral rights to Inuit-Owned Lands (IOL) in Nunavut, including the surface rights over the entire Hope Bay Property and mineral rights over selected portions of the Property. The KIA administers the surface rights and the Inuit Impact and Benefits Agreement (IIBA) associated with AEM's activities at the Property. The Kitikmeot Inuit Association (KIA) and AEM will continue to share in existing and future benefits through partnerships and agreements already in place including the Framework Agreement, the Inuit Impact Benefits Agreement (IIBA) and the Commercial Lease. Both organizations fill important roles on behalf of Inuit and they ensure, along with AEM, that the existing Framework Agreement and other, future agreements as required, will provide continued social and economic benefits for Nunavummiut, Nunavut and Canada, while effective stewardship of the land is maintained.

As outlined in AMEC (2005), the region has seven communities. The Kitikmeot communities would be most impacted (beyond the immediate personnel on site) from the TIA and Hope Bay project as a whole. Cambridge Bay is the largest and is the regional centre and transportation hub. Kugluktuk, the second largest community, is situated 450km south west of Cambridge Bay. Gjoa Haven, Taloyoak and Kugaaruk are located in the eastern part of the Region. The two smallest communities, Bathurst Inlet and Umingmaktok, south of Cambridge Bay, are the nearest communities to the TIA. Bathurst Inlet is approximately 150 km southwest and Umingmaktok is approximately 75 kms west-southwest from the TIA.

As outlined in FEIS Land Use volume, the Hope Bay Project has the potential to have an adverse effect on commercial land and resource use, and on local land use activities and knowledge. Commercial land users are mainly those engaged in the tourism industry (lodge operators, tour guides). Inuit (i.e., local land users) engaged in land use and harvesting activities depend on the land and environment to support their livelihoods. Traditional knowledge informs the ways in which Inuit engage with the land and environment and is continually evolving in response to changing landscapes. Because of the physical presence of the Project, changes to levels of noise, dust, and visual aesthetics—and potential changes to the abundance, distribution and quality of animals and plants that are harvested—the Project has the potential to adversely affect land use. Land use interests that are not associated with traditional activities, such as non-commercial land use (e.g., recreational use by southerners), are considered to

occur as a commercial land use in conjunction with lodge operators and tour guides and is assessed as such. Therefore, non-commercial land uses are not considered further (TMAC 2017d).

3.5 Relevant Legislation and Guidance

Jurisdiction	Government of Canada and Kitikmeot Inuit Association
Governing Bodies	Authorities involved with permitting and regulating the design, construction, operation, maintenance, surveillance, and closure of the tailings impoundment area include the following groups: • Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) • Kitikmeot Inuit Association (KIA) • Nunavut Impact Review Board (NIRB) • Nunavut Water Board (NWB) • Workers Safety and Compensation Commission Chief Mines Inspector (per the Mine Health and Safety Act) and its associated regulations (Government of Nunavut, 1995)
Regulating Authorities	Use of the TIA is authorized by the following: • Doris North Project NIRB Project Certificate No. 003 (NIRB 2006) • Doris North Project Type A Water Licence 2AM-DOH1335 – Amendment No. 2 (NWB 2018) • KIA Commercial Lease #KTCL#313D001 (KIA 2015) • Schedule 2 of the Metal and Diamond Mining Effluent Regulations (MDMER)
Governance of Manual's Contents	**Agnico Eagle Mines Ltd (AEM)** • Corporate Standard on Tailings Storage facilities and Heap Leach Facilities (AEM 2013) **Canadian Dam Association (CDA)** • Dam Safety Guidelines (CDA 2013) – Guidance related to design and operation of dams • Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (CDA 2014) – Guidance related to design, operation and closure of tailings dams **Mining Association of Canada (MAC)** • A Guide to the Management of Tailings Facilities, Third Edition (2021) – Guidance related to the management of Tailings Facilities **Nunavut Water Board (NWB)**

- Audit and Assessment of Tailings Facilities (2011) – Guidance for audit and inspection of tailings facilities
- Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (2011) – Guidance for structure and content of tailings OMS manuals
- Management of Tailings Facilities (2011) – Guidance for management and operation of tailings facilities
- Water License No: 2AM-DOH1335, Amendment No.2, Doris North Project, Nunavut (2018) – License to operate. Expires March 30, 2035. License updated December 7, 2018 with approval of amendment

3.6 Facility Components

North Dam

The North Dam impounds Reclaim Pond and was designed as a water retaining structure with the following parameters:

- central frozen core with secondary upstream GCL
- construction from local quarry rock consisting of processed fines for core, 150 mm nominal sized transition material, and run of quarry (ROQ) outer shell
- key trench equipped with 12 horizontal thermosyphon evaporators to ensure frozen foundation conditions (SRK 2007, 2012, 2013, 2015a)

Note: The North Dam has been in place since 2012. Design parameters are provided in Section 3.10 and Figure 4.

South Dam

The South Dam is a frozen foundation dam consisting of

- a compacted rock fill with
- an upstream GCL keyed into the permafrost overburden foundation.

Note: As of 2018 the entire key trench of the South Dam (Phase 1 and 2) had been constructed, along with the minimum thermal protection over these sections. Above the original ground elevation, the minimal thermal protection over the key trench as well as the Phase 1 GCL and bulk rockfill are in place.

Construction Material

Construction materials are sourced from local rock quarries and include

- ROQ material and

- different grades of processed material attained through crushing and screening (SRK 2015a, SRK 2019b).

Tailings Deposition

Tailings are deposited as a beach from the face of the South Dam. At all times a minimum 100m long beach is planned to be maintained. In Phase 2, to accommodate the increased tailings quantities, the South Dam will be raised

- by 8 m in a downstream configuration
- to reach a crest elevation of 46.0 m.

Note: Design parameters in Section 3.10 and Figure 5.

West Dam

The West Dam is a frozen foundation dam with a

- key trench and
- GCL liner keyed into permafrost.

Note: As of 2022 the West Dam was not required for tailings containment and has therefore has not been constructed.

Construction Material

Construction material consists of:

- bedding, transition, and ROQ material and
- granular fill produced on site from approved local quarries

Note: Complete geological, mineralogical and geochemical details of these quarry sites are documented in SRK (2007, 2008).

Tailings Deposition

West Dam is planned to be constructed in a single raise and is

- about 470 m long
- with a maximum height of 5 m (crest elevation 46.0 m).

Note: Design parameters in Section 3.10 and Figure 6.

Temporary Water Filled Portable Dam

In summer 2022, and temporary water-filled portable dam (Aquadam) was constructed within the TIA footprint to segregate different streams of contact water on site. Currently the Aquadam is being used to contain underground mine water separate from the main TIA.

Interim Dike

In 2022 a more robustly engineered structure, the Interim Dike, was designed as a longer term replacement for the Aquadam, with an identical function. The Interim Dike is currently under construction.

The Interim Dike is designed to:

- be a homogeneous ROQ rock-fill dike with a GCL liner, layer of compacted tailings,
- used as a method of segregating waste streams and managing water quality within the TIA.
- be constructed within the confines of the TIA directly on the existing deposited tailings without dewatering the TIA;
- Not interfere with the originally planned tailings deposition philosophy.

Emergency Overflow Channel

An operational emergency overflow channel was originally designed for the TIA at the North Dam, but was not required due to the freeboard of the North Dam being adjusted to account for an inflow design flood (IDF) of probable maximum flood (PMF). Following any updated IDF requirements, the emergency overflow channel will be constructed at the earliest opportunity with support from the EOR and design engineer. AEM is presently working on an updated design for an Emergency Overflow Channel.

Tailings Deposition System

Tailings with an initial solids content of about 38% should be pumped to the TIA via a heat-traced and insulated pipeline. Daily production rates are variable expected between 1,200 TPD (first year) to an allowance of up to 4,000 TPD (dependent on the mine life).

Deposition

Deposition is

- subaerial using single point spigots,
- start from the crest of the South and West dams to create beaches that push the supernatant water away from these structures, and

Once these beaches are created,

- the spigot points will be moved to the east flank of the TIA, where
- deposition should begin from elevation 49.5 m.

Note: Deposition is carried out to create a long and even tailings surface sloping toward the North Dam, ensuring the water in the original Tail Lake is displaced towards the north.

Note: If saline water (such as from the underground) is deposited into the TIA then this should be preferential deposited towards the center of the facility (i.e. away from the South Dam crest and upstream of the primary North Dam pond).

Note: As the site is presently in a period of Care and Maintenance no tailings deposition is occurring.

Reclaim Water System

Source and Method

Reclaim water (for re-use in the Process Plant during operations) is drawn

- from the TIA Reclaim Pond,
- through submerged suction lines feeding a low-suction head pump installed in an on-shore enclosure location at the Reclaim Pond.

The pipeline is

- heat traced and insulated, and
- follows the Secondary Road from the Reclaim Pond to the Doris mill.

Reclaim Pond Capacity

The Reclaim Pond will reduce in size over the life of the Project. The Reclaim Pond will have enough capacity to allow year-round reclaim water to be drawn from the TIA, including under ice conditions in the winter. Near the end of the Project's life, the pond will be reduced in size such that

- increased volumes of fresh make-up water and more TIA discharge will be required, and
- the full supply level (FSL) may have to be lowered to accommodate the IDF.
- The construction of an Emergency Overflow Channel near the will mitigate the risk to the North Dam associated with the reduced size of the reclaim pond.

Discharge Setting

Water in the Reclaim Pond will continue to be managed via active pumping to the TIA / Roberts Bay Discharge System until the closure environmental discharge criteria can be met at which time,

- the water in the Reclaim Pond will be pumped down to its pre-mining elevation of 28.3 m and
- the North Dam will be breached.

TIA Discharge System

Source and Method

TIA water is discharged year-round to Roberts Bay via a discharge pump that is

- located adjacent to the reclaim pump and
- pumps water along a pipeline following the same route as the reclaim water pipeline.

The TIA discharge water

- may be co-disposed with Doris Mine underground flows and

- may be treated in the Water Treatment Plant (operational in June 2023) and
- is pumped along an overland pipeline to the Robert Bay Outfall Structure and
- continues along the submarine pipeline to the Roberts Bay diffuser.

3.7 Construction Timing

North Dam

Construction of the North Dam was carried out

- during the winter months of 2010/2011 and 2011/2012
- by an experienced earthworks contractor with rigorous quality control.

Quality assurance was carried out by SRK (SRK 2012).

South Dam

Construction started on the South Dam (Phase 1) in 2018. Excavation and backfill of the key trench for both Phase 1 and Phase 2 was completed during winter of 2018. This was done

- to thwart issues caused by thawing of the soft overburden soils and
- to ensure that a thermal blanket is completed to protect the permafrost in the foundation.

Bulk fill of the Phase 1 portion of the South Dam was done during the late winter to spring of 2018. The Phase 2 bulk fill can now be completed during any season.

West Dam

Excavation of the West Dam key trench must be completed in the winter.

Bulk fill can be completed during any season.

The West Dam has yet to be built (as of 2021).

Aquadam and Interim Dike

The Aquadam was installed in June 2022.

The Interim Dike is under construction and is estimated to be completed in Spring 2023.

3.8 Tailings Properties

Tailings properties consist of geotechnical characteristics and geochemistry described below.

Tailings Geotechnical Characteristics

Several campaigns of tailings geotechnical testing have been carried out since 2003. Definitive geotechnical design data for the Project with respect to tailings properties are provided below.

Parameter	Value
Specific gravity	2.85
% Fines (<0.075 mm)	65%
% Silt	52%
% Clay	13%
Void ratio (e) – slurried tailings	1.2
Void ratio (e) – drystack tailings	0.6
Deposited dry density (tonnes/m^3) – slurried tailings	1.30

Tailings Geochemistry

Phase 1 of the Project includes deposition of flotation tailings from the Doris deposit whereas Phase 2 includes the Doris, Madrid and Boston deposits. Based on the mine schedule, tailings from the Madrid South deposit is scheduled to be on the surface of the TIA at closure. The geochemical characterization programs for tailings and process water from Doris, Madrid North, Madrid South and Boston are documented in SRK 2015b and SRK 2017e.

Flotation tailings from all deposits are classified as non-Potential Acid Generating (PAG) with sulphur content highest for Madrid North, which was higher than Boston and Doris (which are roughly equivalent), which were typically higher than Madrid South. Pyrite was the primary sulphide mineral in all tailings types from all deposit areas.

The pH of all humidity cell tests of flotation tailings remained neutral to alkaline for the duration of the tests. Arsenic leaching is the primary metal leaching concern for both Madrid North and Boston and was highest for Madrid North flotation tailings. Arsenic leaching was not related to tailings type, sulphide content or arsenic content.

Process water from the mill is a mixture of flotation and detoxified tailings process water and is discharged to the TIA. A comparison of the mixed tailings process waters for Doris, Madrid North, Madrid South[1] and Boston metallurgical samples were roughly equivalent with the following exceptions:

- Arsenic levels for Madrid North and Boston were approximately two orders of magnitude higher than

Doris, with concentrations from Madrid North slightly higher than Boston.
- Madrid North and Boston were higher than Doris for the following parameters: sulphate, antimony (Boston only), chromium, selenium (Madrid North only), and vanadium (Boston only).
- Doris had the highest levels of manganese.
- Cyanide is a reagent additive that is part of the milling process thus explaining the presence of total and WAD cyanide in the detoxified tailings process water only. Decreases in total and weak acid dissociable (WAD) cyanide were observed over the duration of both the oxic and anoxic tests indicating degradation of residual cyanide in the samples. Ammonia is a degradation product of cyanide thus explaining the elevated ammonia levels.

[1] Where Boston is an analog for Madrid South.

3.9 Dam Hazard Classification

The dams associated with the TIA area consist of

- **North Dam** - Frozen core rock fill dam with GCL
- **South Dam** – Frozen foundation dam with GCL. Constructed in two phases with downstream raises of GCL and rock fill.
- **West Dam** – Frozen foundation rock fill dam with geomembrane

The North, South, and West Dams were assigned a dam hazard classification in accordance with the CDA (2013) dam safety guidelines.

Dam Class	North Dam	South Dam	West Dam
Population at Risk	significant	significant	significant
Loss of Life	significant	significant	significant
Environmental and Cultural Values	high	high	high

Infrastructure and Economics	low	low	low
Overall Hazard Classification	high	high	high

- **Aquadam/Interim Dike** – The Aquadam and Interim Dike are not classified as dams, as they are located entirely within the footprint of the existing TIA, and any loss of containment of the structures would pose no safety or environmental risk.

3.10 Overall TIA Design Criteria and Parameters

The basis of design, design criteria, and design parameters for the TIA outlined below (SRK 2017f).

Description	North Dam	South Dam	West Dam
Secondary Seepage Barrier	GCL	GCL	GCL
GCL Deployment Slope	2.5H:1V	3H:1V (4H:1V for the raise)	3H:1V
Crest Centerline Length	220 m	515 m	470 m
Maximum Height	11.0 m	14.0 m	5.0 m
Final Crest Elevation	37.5 m	46.0 masl	46.0 masl
Initial Crest Elevation	n/a	n/a	n/a
Core/GCL Elevation	35.0 m	45.0 m	45.0 m
Full Supply Level	33.5 masl	44.5 masl	44.5 masl
Normal Operating Water Level	Typically 32m masl, or lower, against the North Dam. Targets set annually and documented in the TIA Annual Geotechnical Inspection reports.		
Total Freeboard	3.3 m	1.5 m	1.5 m
Hydraulic Freeboard	1.8 m	0.5 m	0.5 m
Thermal Protection above Frozen Core	2.5 m	n/a	n/a
Settlement and Allowance Foundation thaw of 1 m (partial thaw) Foundation thaw of 7 m (full thaw)	1 m	 0.47-0.67 m 2.45-3.85 m	 0.40-0.60 m 2.03-3.43 m
Deformation Allowance (Total Strain due to Creep)	<2%	n/a	n/a
Crest Width	13 m	10 m	10 m
Upstream Structure Slope	6H:1V	4H:1V	4H:1V
Downstream Structure Slope	4H:1V	2H:1V	2H:1V
Key Trench Depth	Varies	4.0 m	4.0 m
Key Trench Upstream Slope	0.5H:1V	2H:1V	2H:1V

Description	North Dam	South Dam	West Dam
Key Trench Downstream Slope	0.5H:1V	1H:1V	1H:1V
Dam Hazard Classification	HIGH	HIGH	HIGH
Design Life: Active use period as water retaining structure Design basis as active water retaining structure Active use period as solids retaining structure Design basis as solids retaining structure Total life until breach	 17 years 22 years 22 years	 17 years 25 years	 17 years 25 years
Tailings Production Rate	1,200 tpd for first year; 2,400 tpd for next 2 years; 3,600 tpd for remaining mine life except last year of mining when production rate drops to 2,400 tpd		
Production Life	17 years		
Tailings Solids Content	35% solids (by weight) initially, increasing to 65%	37.5% solids (by weight)	37.5% solids (by weight)
Tailings Specific Gravity	2.85		
Deposited Tailings Dry Density	1.3 t/m^3(1)		
Ice Entrainment Allowance: Percentage of tailings capacity By volume	 20% 2.4 Mm^3		
Tailings Beach Slope: Subaerial tailings Sub-aqueous tailings	 1.0% 1.0%		
Annual Exceedance Probability (AEP) for Risk Based IDF	1/2475 (0.0004)		
AEP for Standards Based IDF	1/3 between 1/1000 and the Probable Maximum Flood (PMF)(1)		
Static Stability Factor of Safety Long-term (Drained Conditions)	1.3 during construction 1.5 during operation and closure 1.2 to 1.3 partial or rapid drawdown		
Stability Factors of Safety (Pseudo-Static)	1.0 during earthquake		
AEP for Earthquake Design Ground Motion	1.2 post earthquake		
Peak Ground Acceleration (PGA)	0.060g(2)	0.036g	0.043g
Mean Annual Air Temperature Climate Change	+6.8°C up to year 2100		
Thermal Design Freezing Point Depression Tailings Overburden Frozen core	 n/a -8°C -2°C	 0 to -1°C -2°C n/a	 0 to -1°C -2°C n/a
Seepage Allowance	78 m^3/day	50 m^3/day	<1 m^3/day

Notes:

(1) Value based on experiential engineered judgement.

(2) A peak ground acceleration for a 1/2475 return period was not available at the time of design of the North Dam, and therefore the PGA of 0.06 g was selected based on published data for Kugluktuk. This is further described in SRK (2007).

3.11 Dam Break Analysis

In determining the dam hazard classification, consideration was given to tailings supernatant water and tailings solids reaching the receiving environment**. The breach scenarios use extremely conservative assumptions, and are not considered to represent a probable outcome in the event of a dam failure. The scenarios are adopted for the purposes of emergency planning and dam hazard classification only.**

In 2019, a dam breach analysis was completed for the North and South Dam as part of the 2019 Dam Emergency Plan (Appendix F). These dam break checks were used to confirm the conclusions below.

North Dam

Breaching of the North Dam would reach

- Tail Lake outflow,
- Doris Lake, Doris Creek,
- and Little Roberts Lake further downstream.

Supernatant Water

Supernatant water could conceivably reach the entire north downstream catchment all the way to Roberts Bay.

Note: under an extremely conservative case where the largest possible volume of supernatant water (over 12 Mm^3) is discharged rapidly over a period of less than 8hrs, then the Doris Creek Bridge would also be damaged. This scenario has been adopted for the purposes of emergency planning.

Tailings Solids

Based on the current deposition plans (off the South and West dams on the south end of the TIA) there is no conceivable chance of tailings solids being released as a result of a breach of the North Dam.

South Dam

Breaching of the South Dam would reach

- Ogama Lake,
- Ogama Lake outflow, and
- Subsequently, Doris Lake.

Supernatant Water

Supernatant water would eventually progress all the way along the drainage network to Roberts Bay.

Tailings Solids

A breach of the South Dam could result in tailings solids releasing

- into Ogama Lake and
- though a remote chance, into the Ogama Lake outflow and ultimately Doris Lake.

	Tailings solids would not be expected to be transported any further than Doris Lake, with most tailings between the South Dam and down to and into Ogama Lake.
West Dam	Tailings breaching the West Dam would reach Doris Lake. **Supernatant Water** Supernatant water could progress all the way along the drainage network to Roberts Bay. **Tailings Solids** Tailings solids could reach Doris Lake, but at a location about 3.5 km away from the Doris Lake outflow. It is not expected the solids would migrate any further.

3.12 Water Management

Contact Water	All site contact water is pumped or trucked to the TIA.
Underground Water	Saline underground water (i.e., mine water) may be pumped to the TIA or Roberts Bay at an expected maximum rate of 3,000 m^3/day (SRK 2015c). Saline water pumping to the TIA should be limited as much as practical / when possible to assist with maintaining lower operating levels in the TIA. Since summer 2022, mine water has been periodically pumped to the Aquadam and remains separate from the main TIA. **Note:** Standby pump capacity should be available on site in the event of mine water inflows greater than 3,000 m^3/day, wherein excess mine water may be pumped to the TIA.
Mill Water	Mill make-up water is drawn from the Reclaim Pond to the extent possible.
Excess Water	Year round (any season) as long as the site water quality requirements (Mining and Diamond Mining Effluent Regulations - MMDER) are met. Any excess water in the TIA during operations should be discharged to Roberts Bay for ocean discharge at a rate of 6,750 m^3/day. Prior to discharge to Roberts Bay, all water must meet MDMER limits (SRK 2017a and TMAC 2017a).
Non-Contact Water	There are no non-contact surface water diversions upstream of the TIA. The TIA is in an isolated catchment, and the benefits of any diversions are outweighed by the relative cost and complexity of constructing them.
General Guidance	A site wide water and load balance, including the TIA, has been developed for the Project and forms the basis for the water management plan (SRK

	2017a and TMAC 2017a). The water and load balance was validated in 2022 (SRK xx)

3.13 Tailings Facility Performance

All data collected as part of the dam monitoring SOPs, currently the North Dam (SRK 2022) and South Dam (SRK 2022) re uploaded monthly onto the site TIA web portal / viewer.

The Environmental and Geotechnical Data Management and GIS Map Viewer System is found online at: https://maps.srk.com/HopeBay/

When initially accessing the site, personnel will need to register as a new user. This can be requested through the web link show above. Once access is set up, currently managed through SRK, a confirmation email is sent to the user.

Note: if a user does not receive their confirmation access email then they should check their junk mailbox. If it does not appear in this location, then they should email the EOR and re-request access to the online portal and GIS viewer.

As of the end of 2022 the following information was available, and updated monthly, on the web portal:

North Dam	• Ground temperature cables • Inclinometer data • Datalogger battery levels and temperatures
South Dam	• Ground temperature cables • Aerial satellite photos of tailings deposition (Sentinel-2 data)
TIA Reservoir	• TL-1 water level • TL-1 water quality • TL-5 water quality

Relevant documents related to the TIA as listed in section 1.2, such as this OMS, the design reports, as-built reports, annual inspections, and SOPs are also available on the web portal for reference.

In addition, ongoing data reviews are completed by the Design Engineer (and supporting team) on a monthly basis. A detailed annual review of all performance data is completed as part of the annual inspections.

4 Dam Safety Management System

Definition	The Dam Safety Management System (DSMS) is a collection of documents and system that define the safe operation and management of the North Dam and South Dam at the Doris TIA. The Doris TIA OMS Manual is a part of

	the DSMS, its function with respect to other key documents is outlined in Section 4.1 below.
Objectives	• Act as a prescriptive framework of documents that to be referenced for safe and effective management and operation of the Dams • The documents work together to define the approach to dam safety at Hope Bay
Components	The key documents comprising the DSMS include: • Hope Bay Doris TIA OMS Manual • Doris TIA Trigger Action Response Plan • Dam Monitoring Standard Operating Procedures • Hope Bay Project Dam Emergency Plan • Hope Bay Project Emergency Response Plan

4.1 TIA Dam Safety Management System Key Documents

The function of each document is described in Table 4-1 below. The relationship and references between the documents are outline in Figure 4-1 below.

Table 4-1 - DSMS Key Document Definitions

Document	DSMS Function
Hope Bay Doris TIA OMS Manual (this document)	• Main operational document for the Doris TIA • Defines the Dam Safety Management System framework for Hope Bay • Contains (as Appendices) or references other key DSMS documents such as the DEP (see below)
Doris TIA Trigger Action Response Plan	• Appendix G of the Hope Bay TIA OMS Manual • Defines the conditions and thresholds corresponding to each trigger level for the North Dam, South Dam, and the TIA Reclaim Pond Water Elevation • Defines initial actions to be taken for operational trigger levels: o Green: Normal Operating Conditions o Yellow: Early Warning Conditions o Orange: Corrective Action Conditions o Red: Emergency/Uncontrolled Condition • Specific conditions and thresholds are defined for instrumentation data readings, as well as visual observations from inspections.

Dam Monitoring Standard Operating Procedures	• Appendix H of the Hope Bay TIA OMS Manual • Describe in detail the requirements and procedures for dam monitoring under normal operating (Green) conditions
Hope Bay Project Dam Emergency Plan	• Appendix F of the Hope Bay TIA OMS Manual • Activates in the event of an emergency at any of the dams on site. • Further defines the initial response to an emergency condition at the dams (Red Trigger Level). • Includes the personnel, equipment and communication systems available to respond to an emergency situation at the dams. • Is linked the Hope Bay Project ERP
Hope Bay Project Emergency Response Plan	• Appendix E of the Hope Bay TIA OMS Manual • Activates in the event of an emergency on site. • Defines the initial response to an emergency. • Includes the personnel, equipment and communication systems available to respond to an emergency situation.

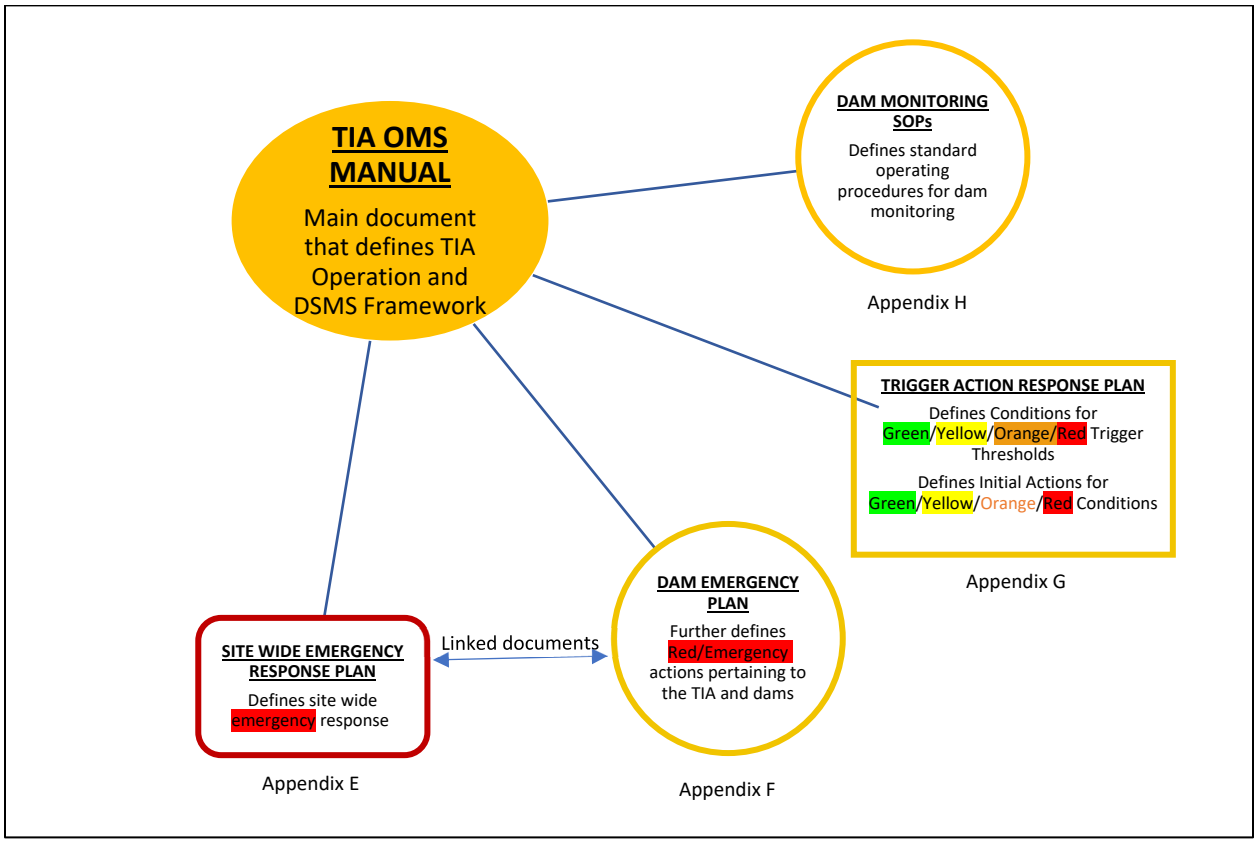

Figure 4-1 - DSMS Document Relationships

4.2 Trigger Action Response Plan Levels

The Trigger Action Response Plan defines the initial actions to be taken in response to specific conditions observed at the TIA and dams. The Trigger Action Response plan includes detailed thresholds for each Green/Yellow/Orange/Red Conditions observed or recorded at the Dams and TIA. Table 4-2 provides encompassing definitions for each of the trigger levels for the Hope Bay Project.

The complete Trigger Action Response Plan be found in Appendix G.

Table 4-2 - Definition of Trigger Levels

Trigger Level	Condition	Definition
Green	Normal Operating Condition	Maintain normal operating procedures.
Yellow - Level 1	Early Warning Condition	Areas of concern identified - Requires further investigation to determine **requirements for increased monitoring**
Orange - Level 2	Corrective Action Condition	High Risk Situation - Requires mitigation actions or operational controls to prevent an emergency situation from developing. **Implement Level 2 Actions.**
Red - Level 3	Critical Condition	Emergency Situation - Immediate threat to health and safety or environment that is uncontrollable through operational controls or mitigation actions. **Implement the site wide Emergency Response Plan and/or Dam Emergency Plan**

4.3 DSMS Communication and Decision Making

Figure 4-2 indicates the communication and decision processes when the threshold criteria are met and when pre-defined action need to be implemented. Table 4-3: Communication Procedure to Change TARP Level indicates the communication procedure to follow when changing the TARP level.

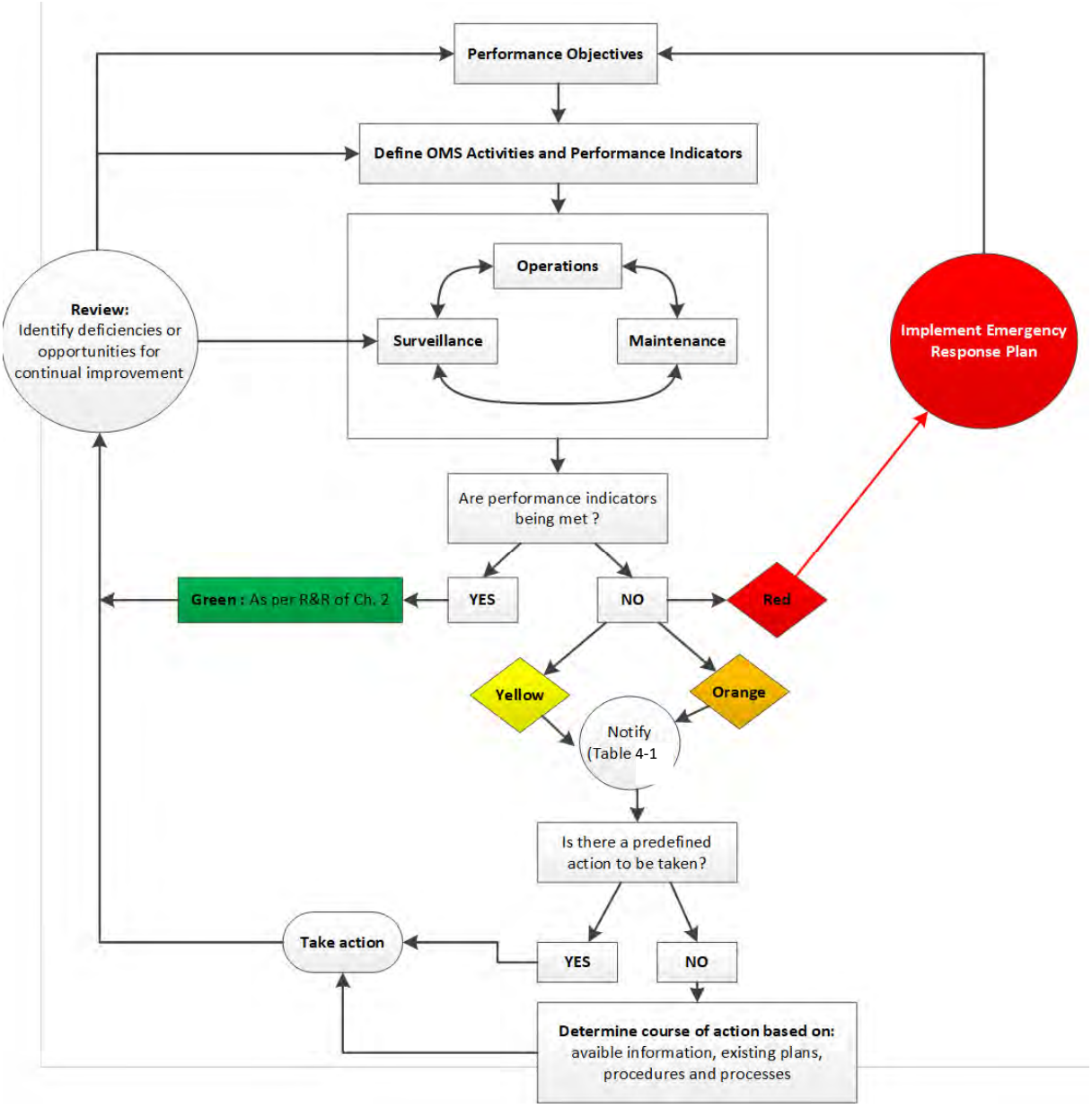

Figure 4-2: Communication and Decision Process for Water Management Infrastructure TARP

Table 4-3: Communication Procedure to Change TARP Level

Category	Notify	Timeline	Method of Communication
Green	On-Site team → Responsible person → • Independent Review Board • Designer • General Manager • EOR • AEO	The trigger are back to green for more than 2 weeks	Phone Call and E-mail to inform on status change. RP and EOR must agree to change status Brief memo sent by e-mail to officialise TARP change

Category	Notify	Timeline	Method of Communication
Yellow	On-Site team → Responsible person → • EOR	Within 24 hours of the TARP level condition being met	Phone Call and E-mail to inform on status change. RP and EOR must agree to change status. If RP can't be joined the on-site team will try to contact these people in this order : Site Geotechnical Engineer, EOR, AEO
	Responsible person → • Independent Review Board • Design Engineer • General Manager • EOR • Process Plant Superintendent	Within 72 hours of the TARP level change	Brief memo sent by e-mail to officialise TARP change Meeting to be set to explain situation if required
	EOR → • AEO	Within 1 week of TARP level change	Left to the EOR discretion
Orange	On-Site team → Responsible person → • EOR	Immediately upon discovering TARP level triggers change	Phone Call, E-mail and meeting to inform on status change. If RP can't be joined the on-site team will try to contact these people in this order : Site Geotechnical Engineer, EOR, AEO
	Responsible person → • Independent Review Board • Design Engineer • General Manager • EOR • AEO • Health & Safety Superintendent • Process Plant Superintendent	Within 24 hours of the TARP level change	Brief memo sent by e-mail to officialise TARP change Meeting to be set to explain situation
RED	On-Site team → Emergencies Response Team Once an emergency is declared refer to the ERP. Emergency response is out of scope of this document	Immediately when the emergency is discovered. If there is currently a risk to Env or Health and Safety	Emergency – Emergency Emergency and road channel Or at Emergencies 911
		Immediately when the emergency is discovered. If there is imminent risk to Env or Health and Safety	Phone call to ERT coordinator (103) & Health and Safety Superintendent

4.4 North Dam and South Dam Operating and Monitoring Criteria

The operating criteria for the North Dam and South are defined by the Trigger Action Response Plan, and the Dam Monitoring Standard Operating Procedures.

North Dam Monitoring SOP	Appendix H
North Dam Trigger Action Response Plan	Appendix G, Table 1
South Dam Monitoring SOP	Appendix H
South Dam Trigger Action Response Plan	Appendix G, Table 2

Table 4-4 below summarizes the instrumentation and visual monitoring completed at the North and South Dam. The Dam monitoring SOPs (Appendix H), provide details of dam monitoring procedures.

Table 4-4 - Dam Monitoring Summary

Monitoring Component	Monitoring Frequency	North Dam	South Dam
Visual Walkover Inspections	Weekly	Yes	Yes
Deformation Survey Monitoring	Monthly (May to November)	Yes	Yes
Inclinometer Deformation Monitoring	Monthly	Yes	No
Ground Temperature Cable Thermal Monitoring	Continuous/Monthly	Analog Thermistors Continuous Logging, Monthly Download and Data Review	Digital GTCs Continuous logging and satellite transmission, monthly Data Review
TIA Reclaim Pond Water Elevation	Continuous/Daily	Yes	No

4.5 TIA Operating Criteria and Freeboard Requirements

4.5.1 TIA Water Reclaim Pond Operating Criteria and Thresholds

The operating criteria for the TIA water reclaim pond elevation is presented in Table 4-5 below. The water reclaim elevation criteria are also included in the Trigger Action Response Plan (Appendix G, Table 3).

The Hope Bay Water Management Plan provides an overview of the site wide water management strategy.

Table 4-5 - TIA Water Reclaim Pond Operating Criteria and Thresholds

Structure	Freeboard to crest (m)		Maximum tailings elevation (m)	Operation Water level (m)		Corrective Action Condition Max = Full Supply Level (m)	Critical Condition Level (m)
	Tailings	Water		Normal	Early Warning level (m)		
North Dam	N/A	2.0	N/A	<31.5	31.5-32.5	32.5-33.5	>33.5
South Dam	1.5	N/A	33.5	N/A	N/A	N/A	N/A
TARP Level	N/A			Green	Yellow	Orange	Red

Structure	Freeboard to crest (m)		Maximum tailings elevation (m)	Operation Water level (m)		Corrective Action Condition Max = Full Supply Level (m)	Critical Condition Level (m)
	Tailings	Water		Normal	Early Warning level (m)		
Response	N/A			Standard operations	Inform stakeholders (**Table 4-3**)	Immediately take action to stop increase. Inform stakeholders (**Table 4-3**)	Trigger ERP and DEP (Section 8)

4.5.2 North Dam and South Dam Freeboard Requirements

North Dam

The North Dam is operated as a water retaining dam with the parameters indicated below.

Component	Elevation (m)
crest elevation	37.5
top of frozen core and geosynthetic clay layer	35.3
full supply level	33.5
total freeboard	4.2
normal freeboard	2

Note: These freeboard numbers include a 1 m allowance for dam deformation (SRK 2015a). Total freeboard also includes required area to store a storm volume at least 1/3 between 1/1000 and the PMF (see Section 3.10).

South and West Dams

The South and West Dams are not water retaining structures with the parameters indicated below.

Component	Elevation (m)
crest elevation – Phase 1 (current elevation) crest elevation – Phase 2	38.0 44.5
top of geosynthetic clay liner – Phase 1 (current elevation) top of geosynthetic clay liner – Phase 2	36.5 45.0
full supply level	33.5
freeboard	1.5

Note: Tailings beaches along the upstream slope of these dams creates a final topography that free-drains towards the Reclaim Pond ensuring no water will pond adjacent to these structures. Tailings deposition discharges from points located near the dam crest. The tailings level at the South and West dam is designed to be above the full supply level (which is governed by the elevation of the North Dam).

5 TIA Operations

Definition

Operations is a job, task, or group of tasks performed at the project site (Hope Bay). Operations are the process of managing many intermediate and long-term activities in and around the mine site to facilitate the production of a mineral product (ref: mndm.gov.on.ca). In the case of this manual operations are the activities around the TIA that are done to ensure TIA performance is upheld while facilitating the TIA use for waste and water management. Related documents and SOPs are reference in section 1.2 of this manual

Objectives

The operational objectives for the Doris TIA are to

- implement controls that enable the facility to operate within its intended design and
- meet performance targets during operations, closure, and post-closure.

Components

Operation of the TIA involves the following periods.

Periods	Description
Operation	Tailings slurry will be subaerially deposited into the TIA and water from the Reclaim Pond will be simultaneously recovered.
At Closure	Water in the Reclaim Pond will continue to be discharged directly to Roberts Bay until water quality in the TIA meets Doris Creek water quality discharge criteria as listed in the water licence (SRK 2017a). Once criteria are met, the North Dam will be breached and • exposed tailings surface will be covered with a run-of-quarry rock cover, and • the Interim Dike (if constructed) will be lowered to match the cover elevation (SRK 2015a).
Operation and Active Closure (current period)	During operation and active closure, the following will be maintained and surveyed to ensure their performance within stipulated design and operating limits: • North, South, and West Dams • Interim Dike (if constructed) • tailings feed pipelines • reclaim water pipelines

	• discharge pipeline
Post-Closure	After a period of post-closure confirmatory monitoring, site presence will cease. **Note:** Triggers for determining cessation of post-closure monitoring will be determined by AEM as part of future closure plan updates and will be submitted to the NWB for approval.

Components Operating Outside Parameters

TIA components operating outside of design or performance parameters will be investigated and remedied by one or more of the following actions:

- conducting appropriate maintenance
- modifying surveillance methods
- revising operational procedures
- implementing remedial measures revisiting the design

5.1 TIA Operating Criteria and Performance Indicators

Deformation, Cracks and Seepages – North Dam

Trigger

Excessive thaw of foundation

See Section 4 – Dam Safety Management System, for comprehensive outline of operating criteria.

Operational and Preventative Maintenance

- Maintain lowest possible water level in TIA.
- Ensure thermosiphons are operational.
- Maintain core at −2˚C and foundation at −8˚C.
- Implement seepage pump-back system.
- Ongoing review of thermistor, inclinometer and survey information

Possible Mitigation Strategies

- Clear snow at downstream toe during winter.
- Construct coarse rock convection berm at downstream toe.
- Convert thermosiphons to active thermosiphons.
- Retrofit dam with vertical thermosiphons.

Deformation, Cracks and Seepages – South and West Dams	**Trigger** Excessive thaw of foundation See Section 4 – Dam Safety Management System, for comprehensive outline of operating criteria. **Operational and Preventative Maintenance** • Maximize beach development from dam. • Maintain lowest possible water level in TIA. • Maintain foundation at −2°C. • Implement seepage pump-back system. • Ongoing review of thermistor, and survey information **Possible Mitigation Strategies** • Flatten downstream dam slope. • Clear snow at downstream toe during winter. • Construct coarse rock convection berm at downstream toe. • Retrofit dam with vertical thermosiphons.
Water Balance	**Trigger** Reclaim water shortage **Operational and Preventative Maintenance** • Manage annual discharge to maintain minimum required operating water level. • See section 4 for operational water level and freeboard requirements **Possible Mitigation Strategies** • Increase make-up water demand from Doris Lake.
	Trigger Excessive inventory See Section 4 – Dam Safety Management System, for comprehensive outline of operating criteria. **Operational and Preventative Maintenance** • Manage discharge to not exceed maximum required operating water level. **Possible Mitigation Strategies** • Increase discharge capacity. • Increase water treatment (if / as required)
	Trigger

Load Balance	Reclaim water shortage **Operational and Preventative Maintenance** • Manage annual discharge to maintain minimum required operating water level. **Possible Mitigation Strategies** • Increase make-up water demand from Doris Lake
	Trigger Excessive inventory or poor water quality **Operational and Preventative Maintenance** • Manage discharge to not exceed maximum required operating water level. **Possible Mitigation Strategies** • Increase discharge capacity (if possible) • Increase water treatment (if / as required) • Increase residence / storage time in TIA (may vary seasonally)
Tailings Deposition	**Trigger** Improper beach development **Operational and Preventative Maintenance** • Survey existing beaches and used data to recalibrate deposition modeling to develop new deposition plan. • Track tailings beach development with satellite surveys (e.g. Sentinel-2) **Possible Mitigation Strategies** • Add additional spigot points as required by the revised deposition plan. • Relocation tailings preferentially to upstream face of South and West dam
Pipeline Freezing – Tailings, Reclaim, and Discharge	**Trigger** Winter period pump stoppage **Operational and Preventative Maintenance** • Maintain minimum flow velocities of 1 m/sec. • Heat tracing and insulation of pipelines. • Mobile backup pumps **Possible Mitigation Strategies** • Installation of secondary pipeline(s).

	• Complete repairs of any damaged insulation in summer (pre-winter)
Pipeline Breakage or Leakage – Tailings, Reclaim, and Discharge	**Trigger** Fatigue, corrosion, or accident **Operational and Preventative Maintenance** • Implement visual inspection procedure. • Establish barricades where appropriate. • Provide secondary containment in high risk areas. **Possible Mitigation Strategies** • Stop pumping and implement site spill response plan.
Pipeline Sanding Up – Tailings	**Trigger** Pump stoppage for extended periods **Operational and Preventative Maintenance** • Mobile backup pumps. • Flush pipeline immediately following pump stoppage. **Possible Mitigation Strategies** • Installation of secondary pipeline. • Dismantling affected section of pipeline and flushing or replace.
Tailings Dust	**Trigger** Wind and equipment traffic **Operational and Preventative Maintenance** • Minimize use of equipment on tailings beaches. • Apply water **Possible Mitigation Strategies** • Apply chemical dust suppressants as appropriate.
Animal Access	**Trigger** Terrestrial mammals entering TIA area **Operational and Preventative Maintenance** • Implement Wildlife Monitoring and Mitigation Plan (WMMP). **Possible Mitigation Strategies** • Refer to WMMP.

People Safety

Trigger

Uninformed people accessing TIA area

Operational and Preventative Maintenance

- Conduct site specific orientation and training.

Possible Mitigation Strategies

- Implement access controls through signs and road barricades.
- Promote awareness, through training and information sessions and site inductions on site.
- Require all vehicles do radio 'call-ins' / checks when entering the Tail Lake Road from camp.

5.2 Tailings Transport and Deposition

Deposition

During operation periods deposition should be subaerial using single point spigots and placed as follows.

Step	Placement
1	Place tailings starting from the crest of the South and West Dams. **Note:** The placement should create beaches that push the supernatant water away from the dams. Tailings deposition is expected to result off the dam crests during the non-ice-covered months (e.g. summer to fall)
2	After the beaches are created, move the spigot points to the east and west flank of the TIA. **Note:** This should create a long, even tailings surface that slopes toward the North Dam and ensures the is displaced towards the north away from the south dam. Deposition at locations upstream of the South and West Dam crest is expected to be done during the colder months when ice is apparent on the TIA reservoir (e.g. winter and spring). This is done to allow for the tailings beach to cool over the winter to better protect the frozen foundations, and to avoid excessive spigot movement in the winter that may lead to increased ice entrainment.

Double-Walled Pipeline Placement

As an added environmental protection measure against spill containment, the pipeline should double-walled at the following locations (SRK 2015a):

- where the pipeline crosses Doris Creek at the Doris Creek bridge and
- at the three locations along the Doris to Windy all-weather road between Madrid North and the Doris North TIA (SRK 2017d).

Staged Tailings Deposition

A series of plans showing the staged tailings deposition for from the projected end of 2020 and then for the end of the active tailings deposition (end of Phase 2) is presented in SRK (2020). This is based on latest bathymetry data and updated tailings deposition plans. Updated tailings stage storage curves are to be generated annually and incorporated into the operational water and load balance tool to track tailings storage capacity, and plan for annual spigot deposition point moves as directed by the design engineer.

The most recent update of the deposition plan occurred in April 2021, prior to the cessation of tailings deposition in October 2021 (SRK 2021).

The stage storage data for the Doris TIA as of the start of 2020 is approximately as follows:

Lower Elevation (m)	Upper Elevation (m)	Volume (m^3)	Cumulative Volume (m^3)	Plan Area (m^2)
19.5	22	0	0	0
22	23	27,000	27,000	53,000
23	24	178,000	178,000	203,000
24	25	440,000	440,000	310,000
25	26	816,000	816,000	429,000
26	27	1,295,000	1,295,000	524,000
27	28	1,860,000	1,860,000	605,000
28	29	2,509,000	2,509,000	690,000
29	30	3,243,000	3,243,000	770,000

30	31	4,061,000	4,061,000	874,000
31	32	5,042,000	5,042,000	1,057,000
32	33	6,169,000	6,169,000	1,185,000
33	34	7,417,000	7,417,000	1,307,000
34	35	8,785,000	8,785,000	1,418,000
35	36	10,257,000	10,257,000	1,528,000
36	36.75	11,434,000	11,434,000	1,609,000

Deposition Planning Compliance

At the end of each month the compliance to the deposition performed must be validated against the performance indicator in the table below to verify if the deposition is on track. This compliance analysis is documented monthly in the SRK monthly dashboards.

5.3 Ongoing Construction

Ongoing construction at the TIA is managed in accordance with water license requirements governing the construction of water or mine waste management structures.

Any construction projects at the TIA are to be carried out such that the operation of the TIA is not impacted by the construction works. If this is not possible, interim operating documents and criteria will be developed for the impacted period.

5.4 Dust Management

Control Measures

The tailings deposition plan was developed, as far as practical, to minimize the area of exposed inactive tailings surface that may be prone to dusting. Nevertheless, when needed, application of environmentally suitable chemical dust suppressants should be

- applied annually in general,
- applied more frequently if needed as discharge locations change, and
- reviewed on an ongoing basis to ensure at-risk areas are adequately covered.

Note: Appendix B provides a comprehensive assessment of possible dust management practices for the tailings surface.

Control Products

While the effectiveness of dust suppression fluctuates depending on how deposition points vary during the winter season, dust should be controlled using

- packed snow when available and practical,
- chemical suppressants, and
- water cannons to wet areas of concerns when other methods prove temporarily ineffective.

Note: Attachment C contains details on the product that has been outlined as preferred by AEM. Use dust suppression products is permitted upon receipt of approval from the Nunavut Water Board.

5.5 Water Management

Contact Water

In addition to tailings slurry, the following sources of mine contact water may be pumped to the TIA during operations:

- underground mine water
- pollution control pond water
- sedimentation pond water
- landfill sump water
- bulk fuel storage sump water
- treated sewage effluent
- other industrial water collected from various locations (Figure 8)

Supernatant Water

Drains into the TIA Reclaim Pond and reclaimed for use in mill operations

Excess Water

If in…	then excess water discharges to Roberts Bay…
operations	year round
care and maintenance	via the Marine Outfall Mixing Box annually.

Note: Site specific water quality requirements (MMDER) must be met before any discharge.

General Guidance

Complete water management procedures are provided in the Water Management Plan (SRK 2017a, AEM 2022a) and the Site Wide Water Management Tool.

5.6 Site Access and Security

Access

The Doris project is accessed by

- air via an all-weather air strip and
- water via a barge sealift resupply in Roberts Bay annually during the open water season.

Security

Access to the TIA is restricted to authorized

- employees,
- contractors, and
- consultants.

Note: All workers accessing the facility are trained and knowledgeable about hazards at and near the TIA.

5.7 Environmental Protection

Aquatic Environment

Protection of the aquatic environment was incorporated into the design of the facility through

- selection of a dam classification criterion,
- dust management system,
- water management planning,
- the incorporation of an impermeable liner within the North, South and West Dams, and
- secondary pipeline containment along the extent of the Doris Creek crossing and along the creek crossing form Madrid North to the Doris TIA along the all-weather access road.

References: SRK 2015a, 2015d, 2017d and TMAC 2016.

5.8 Freeboard Requirements and Operating Levels

Freeboard requirements and operating water levels are a key part of the TIA Dam Safety Management system and are outlined in Section 4.5.

5.9 Communication and Decision Making

Operational communication and decision making will be carried out in accordance with the Roles and Responsibilities outlined in Section 2.1 and 2.3, and the decision making and communication process outlined in Section 4.3.

5.10 Closure Overview

The overall objectives of the conceptual closure and reclamation plan are to leave the site in a manner safe for humans, wildlife, and the environment that meets future land use goals. This will be done by establishing stable chemical and physical conditions and ensuring the future use and aesthetics of the site following reclamation meet the requirements of Aboriginal, Federal and Territorial governments, landowners, local communities and regulatory authorities.

The tailings surface will be covered with a nominal waste rock cover of 0.3 m thickness. The function of the cover is to prevent dust and to minimize direct contact by terrestrial wildlife. Once the water quality in the Reclaim Pond has reached the required discharge criteria, the North Dam will be breached as originally intended for Phase 1. The TIA once breached will discharge into Doris Lake which in turn discharges into Doris Creek.

The TIA will only contain flotation tailings which are non-PAG with abundant neutralization potential and thus buffering capacity. Although several metals in the tailings solids occur at concentrations more than crustal abundances, many of these metals are associated with sulphides and as such will primarily partition into the detoxified tailings which means they will not be of concern in the TIA.

Long-term humidity cell tests indicate that after the initial flushing of the samples, an increased tendency for neutral pH metal leaching may develop, with arsenic being of concern. The TIA water and load balance (SRK 2017a) suggests that possible neutral metal leaching does not pose a limitation in ensuring that the water quality in the TIA meet site specific closure water quality criteria, and therefore no infiltration reduction cover is required on the exposed tailings surface. The tailings surface will, however, be susceptible to wind erosion with the resultant effect of dust exposure. Similarly, although the tailings surface is landscaped to allow free drainage, the tailings are susceptible to hydraulic erosion, which will mobilize tailings towards the Reclaim Pond with a resultant increase in total suspended solids.

The tailings cover that functions to prevent wind and water erosion will be constructed over the entire tailings surface. The minimum thickness of cover that can practically be placed over the tailings surface would be about 0.3 m thick, and therefore the cover design has been set at 0.3 m thick ROQ material.

6 Maintenance

Definition	Maintenance is an ongoing process of activities to maintain (uphold) the proper function of the TIA, thereby ensuring compliance with safety regulations. Ongoing maintenance can consist of items such as housekeeping, small repairs and regular inspection of the dam structures and proper operation of all components linked to the TIA. Good maintenance habits can lead to early detection of deficiencies, help reduce the risk of failures, and extend the useful life of the dams and TIA system as a whole.
Objective	The objective of the maintenance program is to ensure all TIA components operation according to their performance criteria by carrying out • routine and preventative maintenance (such as to address minor settlement) and • event-driven maintenance (such as after a large storm event)
Components	The Doris TIA components that require maintenance include the • pipeline systems, including the ocean discharge system and • North Dam, South Dam, and West Dam (not yet constructed).

6.1 Pipeline Systems Maintenance

Scope	Routine and preventative maintenance should be carried out on pumps, pipelines, drain outlet pipes, valves, and flow and hour meters.
Person(s) Responsible	Maintenance General Supervisor
Frequency	Varies by component (see below)

Documentation	Maintenance records for each component are communicated to the Maintenance General Supervisor, kept by maintenance and include the following: • up-to-date logs of in-service equipment and facilities • maintenance schedules • maintenance history • inspection logs • repair records • frequency and cause of problems, and planned mitigation • component reliability records • photographic evidence of repairs • inventory of spares, material, tools, and equipment • critical spares list
Reporting	Hard copies of all documents produced in the reporting and tracking process should be stored at the project safe-keeping location. All hard copy documents should be scanned and turned into electronic records at least annually. All electronic documents should be saved on a safe computer or network drive.
Pumps	Maintain pumps (including seals, controls, instrumentation, and electrics) per the manufacturer's specifications.
Pipelines	Flush pipelines completely with fresh water every six months (or as needed). Pressure test pipelines to check for leaks annually.
Drain Outlet Pipes	Monitor drain outlet pipes during drainage. **Important!** If a flow rate drop-off is detected, flush the pipe using hydraulic cleaning equipment.
Valves	Maintain isolating and check valves per the manufacturer's specifications.
Flow and Hour Meters	Service flow and hour meters annually, recalibrating them to the manufacturer's specifications.

6.2 Dam Maintenance

Scope	Dam maintenance needs should be determined after completion of the dam safety inspection (Section 7.5). However, ongoing maintenance of instrumentation, the foundations, downstream toe, and thermosyphons will be likely / should be expected to be required each year during operation.

Person(s) Responsible	Responsible Person
Frequency	Annually
Documentation	As-built survey pick-up and a written and document event log (outlining the approach taken for any maintenance as well as the element and location) will be required. If fill materials are placed, then volume estimated (truck counts and as-built surveys before and after) should be completed.
Reporting	A record of all maintenance activities should be kept on site and reviewed at least monthly by the Responsible Person. For any notable earthworks, or areas where maintenance is done over a larger special extent, (e.g. to clean up a tailings spill, fill placement for buttressing or crack repair etc…) the EOR should be notified and as-built survey pick-ups must be completed.
General Guidance	The annual geotechnical inspection reports (as performed by the EOR and/or design engineer) should be consulted for examples of past maintenance and for general guidance.
Instrumentation	Repair or replace worn, damaged, or defunct instrumentation as needed and recalibrate.
Foundations	**Background** Thermal modeling for the dams has shown that although the dam core and its foundation will remain frozen, the upstream and downstream foundations will gradually thaw and lead to settlement of those sections of the dam. **Maintenance** Based on the findings of the DSI, areas that have undergone settlement may have to be repaired by adding more fill (SRK 2007, 2013, 2015a).
Downstream Toe	**Background** Snow drifts on the downstream toe of the dams will result in an insulating effect on the downstream toe, which may lead to more rapid thaw of the downstream foundation. **Maintenance** To maximize dam performance beyond what the thermal modelling may suggest, clear snow regularly from this area.

Thermosyphons	Inspect thermosyphons visually for performance deficiencies. If needed, • recharge with CO_2 if needed and • repair or replace any damaged radiator fins (SRK 2013).

6.3 Event-Driven Maintenance

Scope	The TIA should be inspected after unusual or extreme events such as • heavy rainfall (exceeding 20mm per 24 hrs), • wind storms (wind speeds > 100 km/hr), • flooding or exceedance of the full supply level, • severe icing, • rapid snowmelt, or • earthquakes.
Person(s) Responsible	Responsible Person or designate
Frequency and Timing	After unusual or extreme events
Documentation	Records for all event driven maintenance should be summarized in a deliverable format similar to what is required for the visual site inspections (Section 6.1).
Reporting	For event-driven maintenance, the EOR should be notified to ensure maintenance activities and plans are appropriate to uphold the design integrity of the TIA components. As-built surveys will be required to be gathered before and after any even-driven maintenance. All digital files along with notes and photos of the maintenance work performed should be submitted to the EOR for review.
General Guidance	Review the design criteria (Section 3.10) to better understand what triggers the need for event-driven maintenance. **Important!** To a large extent, the judgement of persons responsible on site governs specific event-driven maintenance. When in doubt contact the Environmental Site Superintendent and/ or the EOR for additional guidance or clarification.

7 Surveillance

Definition

Surveillance is the process of gathering information through visual inspections, monitoring performance, safety audits, and data collection.

Objectives

The objectives of the Doris TIA surveillance program are to

- regularly monitor the operational performance of the TIA and its components,
- consistently report observations,
- regularly review and interpret surveillance data, and
- inform preventative maintenance by generating qualitative and quantitative surveillance information.

Components

The surveillance elements for the Doris TIA includes

- visual site inspections,
- instrumentation monitoring (thermal, deformation, and water balance),
- tailings geochemistry monitoring when in operations,
- water quality monitoring,
- dam safety inspections, and
- dam safety reviews.

Data Management

Staff should complete the following actions to manage monitoring data.

Step	Action
1	Back up all monitoring data electronically.
2	Scan manual notes and save together with raw and transposed data.
3	Immediately following collection, qualified staff should review data to • confirm integrity of the instrumentation and • ensure the TIA is performing to expectations and monitoring guidelines specified in the dam surveillance SOPs.

The RP or designate is responsible for ensuring that the ongoing monitoring as documented in the dam surveillance SOP is carried out. If determined

	necessary, the Environmental Superintendent may consult with the EOR to complete a safety inspection outside of the routine annual DSI.

7.1 Visual Site Inspections

Scope	Visual inspections are carried out on the TIA structures including dams, pump stations, pipelines, and spigots.
Person(s) Responsible	Qualified person under the direction of the RP or designate
Frequency	Weekly
Documentation	All inspections and observations are recorded in the appropriate site logbooks.
Reporting	As directed by the Environmental Superintendent personnel will be trained and assigned to complete ongoing weekly visual inspection. **Reporting Notable Changes** Notify the engineer-of-record immediately after any inspection where notable changes to any of the TIA facilities outside of normal operating criteria are observed. If changes are noted at the North or South Dams, or the TIA water level, follow the notification procedure in accordance with the Trigger Action Response Plan for the TIA (See Section 4). The EOR should, in consultation with operations staff, assess the situation and develop any actions plans deemed appropriate. **Annual Reporting** In accordance with the relevant water licences, visual site inspection information (along with instrumentation monitoring information) should be • included in the annual geotechnical inspection report and • submitted no later than March 31 each year (submitted as part of the annual water license requirements).
General Guidance	A monitoring checklist is presented in the dam surveillance.
All Structures	Visually inspect all TIA structures, taking note of • any signs of settlement, • unaccounted for drops in water levels, • signs of seepage, and • any signs of damage or vandalism to instrument clusters.

Dams

Monitor creep deformation within the North Dam and South Dam, as these structures may be susceptible to creep deformation and or thermal degradation of the foundations (all dams) or core (specifically for the North Dam) in the long term.

Pump Stations

Staff are to complete the following actions when visually inspecting pump stations.

Step	Action
1	For each pump, verify • whether it is operating properly, • hours operated, and • discharge and suction pressures.
2	Check for leaks and spillages.
3	Confirm oil levels for all pumps.
4	Inspect water pump seals on tailings pumps.
5	Note alarms and messages.

Pipelines

Staff are to complete the following actions when visually inspecting pipelines.

Step	Action
1	For each pipeline, verify • whether it is operating properly, • hours operated, • flowmeter data, and • operating pressures along each pipeline.
2	Check for leaks and spillages.
3	Note hazards along pipeline route.
4	Verify where tailings deposition has taken place (i.e. within the past 24 hours).
5	Note alarms and messages. **Example:** Malfunction of electric heat tracing cable inside the pipeline during freezing temperatures.

Spigots	Stringent monitoring of the two spigots situated on the east flank of the TIA is required during operations since both spigots are above the crest elevation of the South Dam. **Important!** Spigot elevations are typically lower than the crest elevation of containment structures.

7.2 Instrumentation Monitoring

Scope	Instrumentation monitoring is carried out on the North, South dams (both constructed), and West Dam (when constructed) and include • thermal, settlement, and other general deformation monitoring such as inclinometers, deep survey monitoring points, and surficial survey monitoring points, and • thermal monitoring of the tailings profile to confirm tailings freeze-back assumptions.
Person(s) Responsible	Qualified person under the direction of the RP
Frequency and Timing	Weekly to Monthly
Documentation	Consult latest North Dam and South Dam monitoring Standard Operating Procedures (SOP) documents for additional details and inspections forms.
Reporting	**Monthly Instrumentation Report** Under supervision of the RP or designate, prepare the monthly instrumentation report and submit it to the engineer-of-record. Currently, monthly instrumentation dashboards are produced by the DE (SRK Consulting). **Annual Reporting** In accordance with the relevant water licences, instrumentation monitoring information (along with visual site inspection information) should be • included in the annual geotechnical inspection report and • submitted as part of the annual geotechnical inspection process to the inspector.
General Guidance	Additional guidance on the required instrument monitoring (how to perform and frequency) is presented in the dam surveillance SOPs.
North Dam	The locations of North Dam monitoring instruments are shown in Figures 9 to 12.

South Dam	The locations of South Dam monitoring instruments are shown in Figures 13.
West Dam	As the West Dam is not currently built (will be built as part of Phase 2 operations) there is no required monitoring.

7.3 Tailings Geochemistry Monitoring

Background	To be completed during operational periods. Flotation tailings geochemical characterization testing has confirmed that due to the high neutralization potential and low sulfur content, acid rock drainage potential is considered low; however, there is potential for neutral pH metal leaching, particularly for arsenic (SRK 2015b and SRK 2017e).
Scope	Sample collection for the preparation of a monthly composite sample that will be analysed for • total metals by aqua regia digestion followed by ICP finish, • total sulphur by Leco furnace, and • direct measurement of total inorganic carbon.
Person(s) Responsible	Coordination through AEM site environmental supervisor
Frequency	Weekly during operations
Documentation	Sampling and testing results and analysis presented in annual waste rock, quarry and tailings monitoring reports.
Reporting	In accordance with the relevant water licences, an annual geochemical monitoring report should be submitted no later than March 31 each year.
General Guidance	Recent annual waste rock, quarry and tailings monitoring reports (SRK 2020d)

7.4 Water Quality Monitoring

Scope	TIA Water quality is monitored at compliance station TL-1 at the Reclaim Water pump station. Ongoing review of water quality trends and a comparison to MDMER limits are completed each year. In additional to the above, weekly sampling and geochemical analysis of any North Dam or South Dam toe seepage is to be completed when present.

Person(s) Responsible	Coordination through AEM site environmental supervisor
Frequency	Monthly (minimum) Water quality monitoring for the TIA is described in the Doris and Madrid Water Management Plan (TMAC 2017a). Seepage typically sampled during ice free / summer months (around June to October) if present.
Documentation	Monthly water quality reports prepared by AEM
Reporting	In accordance with the relevant water licences, data should be presented as part of annual reporting.
General Guidance	Water quality monitoring for the TIA is described in the Doris and Madrid Water Management Plan (TMAC 2017a).

7.5 Dam Safety Inspection

Scope	The dam safety inspection is a physical surveillance of the North, South, and West dams.
Person(s) Responsible	The engineer of record and/or design engineer —or another qualified professional engineer authorized by the engineer of record—must complete the inspection.
Frequency and Timing	The dam safety inspection should be carried out • annually • within the summer (ice free) months.
Documentation	Records of annual inspections and detailed review of monitoring data by the engineer of record —or another qualified professional engineer authorized by the engineer of record— presented in a TIA Annual Geotechnical Inspection report (AGI). These are submitted annually and are a permit requirement for the project.
Reporting	The design engineer and/or engineer of record should prepare a detailed dam safety inspection report that includes their findings and recommendations on the performance of the dams and accounts for • review and analysis of collected monitoring data • inspection observations, and • interviews with TIA staff.

	Note: The report should be delivered within 90 days of inspection to Agnico (Responsible Person) so any maintenance and mitigation can be carried as early as possible and to meet submission requirement to NWB.
General Guidance	See recent annual geotechnical inspections for additional details (SRK 2022a).
Significant Concerns	Any areas of significant concern should be immediately communicated to AEM at the time of the dam safety inspection.

7.6 Dam Safety Review

Scope	The dam safety review is a physical surveillance of the Doris TIA with a focus on the North, South, and West Dams. This systematic assessment should consider all aspects of the Doris TIA's design, construction, maintenance, operation, processes, and systems affecting its safety. **Note:** This review should use state-of-practice principles as opposed to when those used when the facilities were designed.
Person(s) Responsible	An independent third party must complete the inspection.
Frequency	The dam safety review should be carried out every seven years in addition to the annual dam safety inspection. **Key Date:** The next dam safety review should be completed in 2028.
Documentation	Records of the dam safety review to be documented in a stand alone dam safety review report.
Reporting	An independent third party professional engineering should prepare a detailed report that documents a complete systematic review and evaluation, of all aspects of design, construction, operation, maintenance, and surveillance, and other relevant processes and systems affecting a dam, to evaluate the design criteria with current standards, operational compliance with design intent, stability and functionality of the dam, and to identify appropriate remedial measures (if / as applicable).
General Guidance	See Mining Association of Canada (MAC) 'A Guide to the Management of Tailings Facilities' (2021) and the Canadian Dam Association (CDA) 'Dam Safety Review Technical Bulletin' (2016)
Significant Concerns	Any areas of significant concern should be immediately communicated to engineer of record and AEM at the time of the dam safety review.

7.7 Independent Review Board Meeting

Scope	The Independent Review Board (IRB) shall meet to discuss the following topics • Site visit of all infrastructure covered by the scope of the IRB, in accordance with AEM's governance policy for the management of critical infrastructure • Review of on-going construction works and monitoring data; • Comment on implementation progress of proposed mine waste management improvement measures; • Provide opinions and guidance to the operation on the physical integrity, safety, behavior, and performance of the confinement systems for mine waste and water retaining infrastructures; and • Comment on management systems, emergency preparedness and overall management approach of the different mine waste management facilities and water retaining infrastructures.
Person(s) Responsible	The RP or designate will organize the meeting
Frequency	A meeting will be held annually, typically following the site visit
Documentation	Presentation material and meeting notes
Reporting	The IRB will submit a report following their observation and recommendation following each meeting. The Environmental Superintendent will ensure that an action plan is developed to address the recommendation and will transmit the report and the action plan to the EOR.
General Guidance	See Agnico's Governance for Critical Infrastructure – Terms of Reference for IRB
Significant Concerns	Any areas of significant concern should be immediately communicated to engineer of record and AEM at the time of the IRB annual visit and/or meeting.

8 Emergency Management

Objectives

The TIA emergency management procedures below have two key objectives:

- avoid injury or death of persons working on or near the TIA, and
- prevent or minimize environmental damage.

Emergency Response Plan

This section outlines links with the site Emergency Response Plan (AEM 2022) and the Dam Emergency Plan (DEP) (AEM 2022). The ERP and the DEP area stand-alone plans and are complimentary to this OMS document, both are located in Appendix E & F respectively.

As outlined in the Dam Safety Management System (See Section 4), the ERP and DEP are to be activated/consulted during emergency conditions at the TIA and Dams (including Red TARP conditions).

The emergency response plan (ERP) and procedures are provided in Appendix E and include
information on the following:

- site access,
- communication and procedures;
- key contacts;
- Emergency Remedial Action for level 2 conditions; and
- Inundation Maps.

Training should be provided to site staff and a designated AEM 'incident command group' created to ensure that a key group of site personnel are thoroughly familiar with all elements of the emergency preparedness and response plan (CDA 2014). The Mine Manager, Process Site Services General Supervisor, Site Health and Safety Superintendent and Environmental Site Superintendent should be trained in problem detection, problem evaluation and appropriate remedial (emergency and non-emergency) measures. This training is essential for proper evaluation of developing situations at all levels of responsibility (initial evaluation is usually based on on-site observations).

Testing is an integral part of emergency preparedness, to ensure that both the documents and the training of involved parties are adequate. Tests can range from a limited pen and paper exercise to a full-scale simulation of an emergency and can include multiple failure scenarios.

	The Mine Manager and Site Health and Safety Superintendent should coordinate and participate in joint periodic testing of the emergency procedures with site staff. It is incumbent upon each responding agency to have adequate plans and trained staff in place to deal with any emergency within their jurisdiction (in the case of Hope Bay in the north central region of Nunavut). The AEM Mine Manager and Site Health and Safety Superintendent is responsible for updating the ERP as deemed practical; this includes small tasks such as updating the contact lists as necessary. Revisions should be issued to all affected agencies identified as document holders (as a minimum everyone outlined in Section 2.1). It is the responsibility of all personnel visiting the site to ensure personal and worker safety. In cases of injuries, medical help must be called. If safe to do so, personnel on site may attend to injured person and, if qualified, administer first aid.
Dam Emergency Plan	The Dam Emergency Plan (Appendix F) addresses dam specific emergencies at Hope Bay. The Dam Emergency Plan is a stand alone document that is a part of the Doris TIA DSMS as outlined in Section 4.

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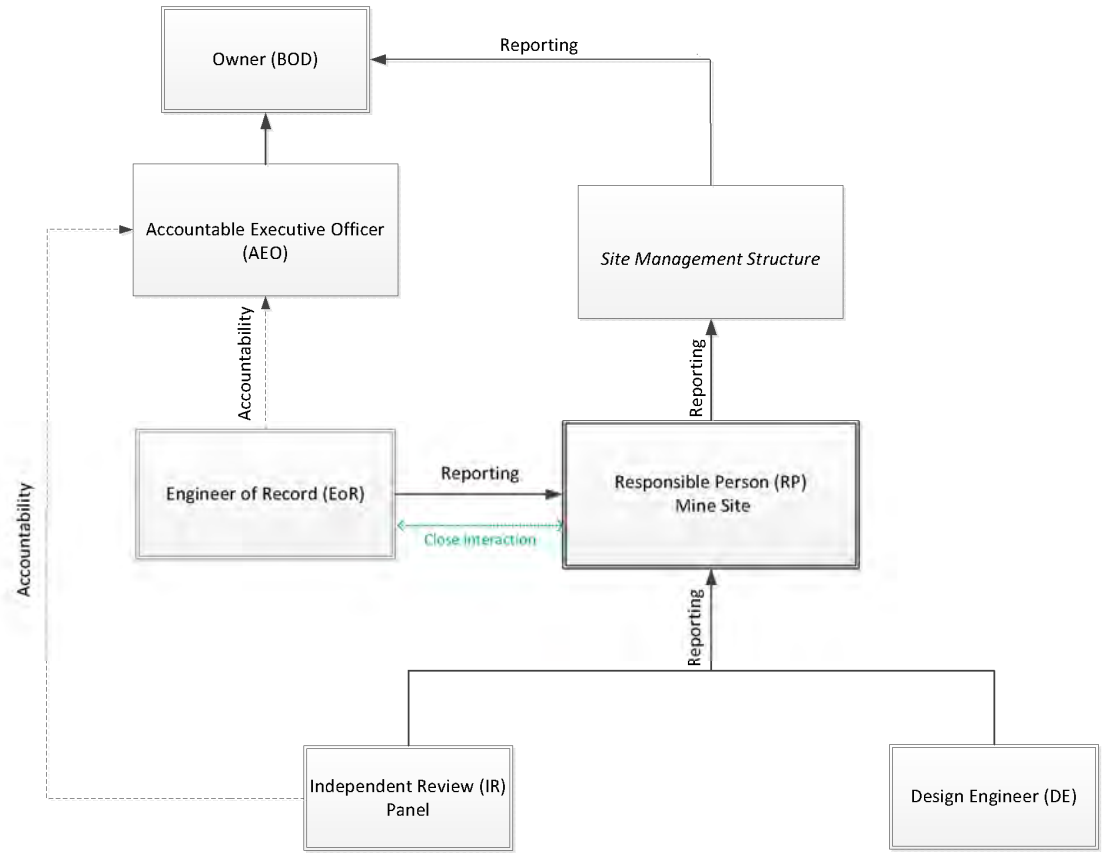
AGNICO EAGLE

OPERATIONS, MAINTENANCE AND SURVEILLANCE MANUAL: HOPE BAY DORIS TAILINGS IMPOUNDMENT AREA

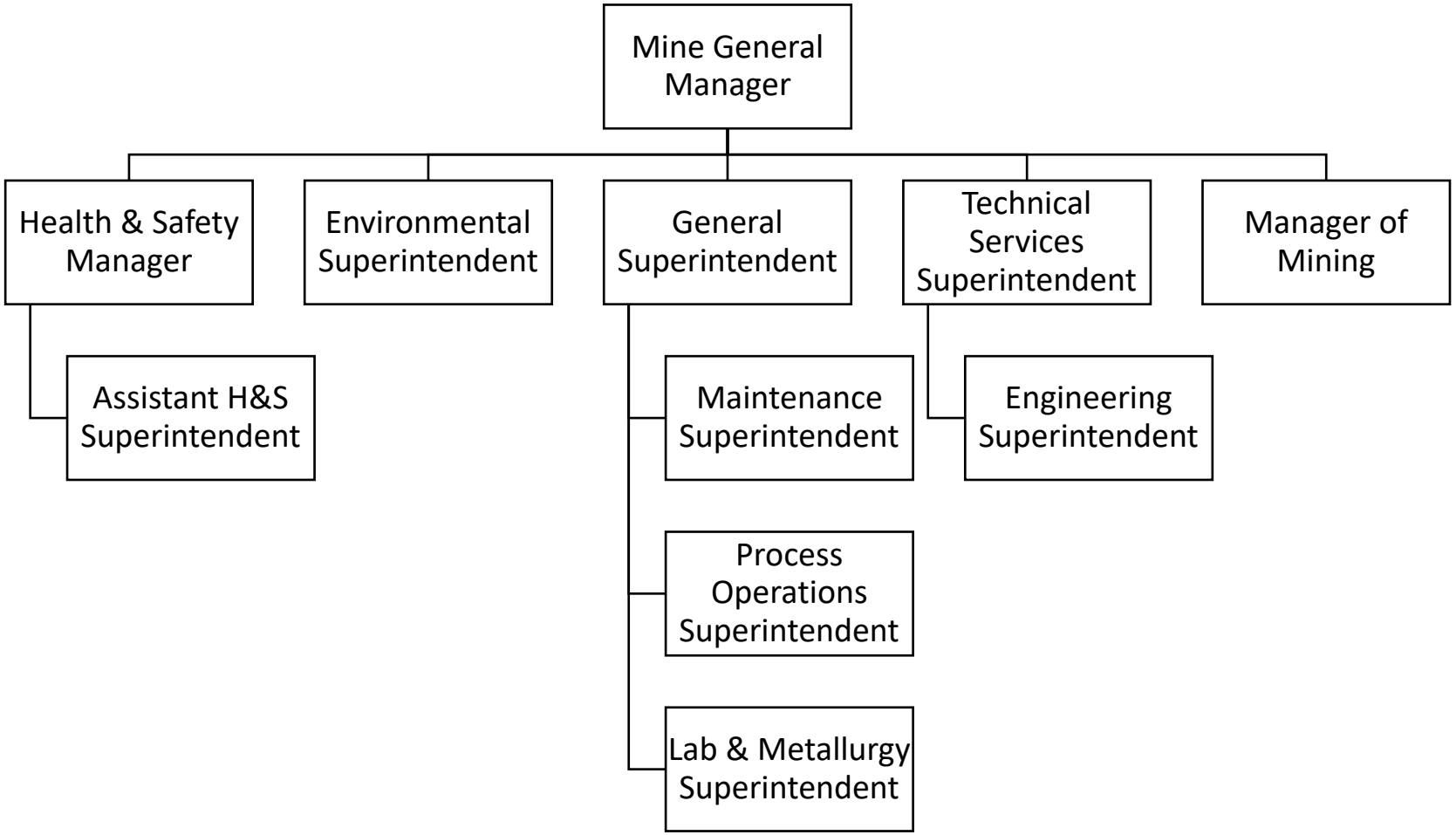
HOPE BAY, NUNAVUT

Appendix A: Site Management Structure

AEM Governance Structure



Hope Bay Site Management Structure (Operations)



OPERATIONS, MAINTENANCE AND SURVEILLANCE MANUAL: HOPE BAY DORIS TAILINGS IMPOUNDMENT AREA

HOPE BAY, NUNAVUT

Appendix B: Tailings Area Dust Control Strategy for Doris TIA

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Memo

To:	Project File	**Client:**	TMAC Resources Inc.
From:	Iozsef Miskolczi, PEng	**Project No:**	1CT022.004
Reviewed By:	Maritz Rykaart, PhD, PEng	**Date:**	December 13, 2016
Subject:	Hope Bay Project: Tailings Area Dust Control Strategy for Doris TIA		

1 Introduction

The Hope Bay Project (the Project) is a gold mining and milling undertaking of TMAC Resources Inc. The Project is located 705 km northeast of Yellowknife and 153 km southwest of Cambridge Bay in Nunavut Territory, and is situated east of Bathurst Inlet. The Project comprises of three distinct areas of known mineralization plus extensive exploration potential and targets. The three areas that host mineral resources are Doris, Madrid, and Boston.

The Project consists of two phases; Phase 1 (Doris project), which is currently being carried out under an existing Water Licence, and Phase 2 which is in the environmental assessment stage. Phase 1 includes mining and infrastructure at Doris, while Phase 2 includes mining and infrastructure at Madrid and Boston located approximately 10 and 60 km due south from Doris, respectively.

Two tailings storage areas are planned for Phase 2. The existing Doris tailings impoundment area (TIA) will be expanded, and a new Boston tailings management area (TMA) will be developed. The Doris TIA tailings deposition will consist of subaerial tailings deposition, while the Boston TMA will be comprised of filtered tailings developed as a dry-stack. This memo is addressing dust management strategies for the Doris TIA.

Two tailings streams will be produced; flotation tailings, comprising approximately 92-94% of the overall volume, and detoxified leach tailings (following cyanidation, and subsequent cyanide destruction), comprising about 6-8% of the overall volume. Only flotation tailings will be deposited in the Doris TIA. The detoxified leach tailings will be filtered, mixed with mine waste rock and used for underground mine backfill.

Upon closure, the tailings surface of the Doris TIA will be covered with a nominal waste rock cover of about 0.3 m thick. The function of the cover is to prevent dust and to minimize direct contact by terrestrial animals. Once the water quality in the Reclaim Pond has reached the required discharge criteria, the North Dam will be breached allowing the TIA to return to its pre-mining elevation of 28.3 m.

Throughout the operational phase, portions of the tailings surface will be exposed, and sufficiently inactive such that they would dry out and pose a dusting risk. This memo describes alternative dust management strategies that have been considered and presents the rationale for selection of the preferred strategy.

2 Definition of Dust

2.1 Fugitive Dust

Fugitive dust is particulate matter suspended in air by wind action and human activities. Within the Doris TIA, tailings will be deposited by hydraulic placement of a tailings slurry which does not generate any fugitive dust. Fugitive tailings dust will however be generated during the period when the tailings closure cover is being constructed.

2.2 Aeolian Dust

Aeolian dust is defined as particles that are transported as suspended load due to wind action on a surface. Although tailings are discharged wet, the surface eventually dries out as a result of evaporation or freezing of the tailings surface. As a result, at any given time, large areas of the tailings surface would expose dry tailings. Aeolian tailings dust is expected because the Project site is prone to high winds and the moderate surrounding topography does not offer effective protection from wind.

3 Typical Dust Control Methods

3.1 State of Practice

Dust control from operating and closed tailings impoundments is a significant concern in the mining industry, and as a result, the state of practice is quite advanced. There are three primary dust control strategies for fugitive and aeolian dust from exposed tailings areas: natural dust control, physical dust control and chemical dust control. Natural dust control specifically relies on maximizing the benefits offered by nature in the form of precipitation (rain and snow). While highly effective, these benefits are opportunistic and may not always be available at the times when it may be needed.

Physical dust control is by far the most effective strategy, as it relies on creating a physical barrier, such as a cover, that would preclude dusting. This may however not be a cost efficient strategy for an operating tailings impoundment, since any interim cover would occupy space within a tailings impoundment that would otherwise be required for tailings.

Chemical dust control relies on modification of the tailings surface that generates the dust. The effectiveness of this method is temporary, but its application is typically simple, making it a very good alternative for managing dust from an operating tailings impoundment.

The sections that follow provide a detailed description of all the dust control methods that are currently being used in the industry, with a specific focus towards their potential applicability for this Project.

3.2 Natural Methods

3.2.1 Snow Cover

If early in the fall season, wet snow falls directly on the exposed tailings surface and subsequently freezes, it will remain in place all winter protecting the tailing surface from dusting. Snow that falls later in the season is typically drier and more powdery and it tends to be subject to wind transport and redistribution (drifting). This means that portions of the tailings surface will become exposed and opportunity for dust release increases. This is exacerbated by the fact that during the winter the tailings surface gets extremely dry as a result of freezing, making it highly susceptible to dusting.

To maximize the potential benefits offered by snow as a natural dust control method, any snow that does fall on the tailings surface can be track compacted in areas where the tailings surface is trafficable. By mechanically compacting the snow, it will stay in place longer and will melt at a much slower rate in the spring, extending the useful life of the snow as a dust control method.

It is however important to minimize the amount of tailings that gets deposited over the compacted snow. If the compacted snow does not melt during the subsequent summer season due to the insulating blanket of the overlying tailings, ice lenses within the tailings impoundment are created which result in a loss of tailings storage space and possible instability.

There is sufficient snowfall at the Project site that this dust control method could be effectively used. In addition, there is a requirement at the Project site for snow removal in specific areas. Snow that is removed could be hauled to the TIA and used specifically for the purpose of creating a compacted snow cover over any temporarily inactive tailings surface areas. Due to the temporary nature of this dust control method, it will not be a complete solution, but would be a practical and complementary method.

3.2.2 Ice Cover

Similar to compacted snow, an ice cover will remain in place for the duration of the winter and thus temporarily mitigate dust migration. Ice cover on exposed tailing surfaces can be achieved by various methods, including ponding water during freezing weather and mechanical placement of ice blocks imported from a different source (contact water ponds).

Water can be held back in specified locations and retained there during the shoulder seasons when freezing weather will create an ice cap. Once the ice cap is achieved the open water beneath the ice can be drained off, leaving an ice cap.

The ice cap can also be created mechanically by loading ice from contact water ponds (or fresh water streams) into haul trucks and dumping the ice on the tailings surface.

Similar to compacted snow, care must be taken to ensure that the amount of tailings deposited over an ice cover is limited to avoid entraining long-term ice in the TIA.

There are several contact water ponds throughout the Project site all of which must be managed such that they are normally empty. Contact water ponds are; therefore, unable to provide a reliable source of water to use to create an ice cover. Fresh water cannot be readily hauled to

the TIA to create an ice cover as the use of fresh water is governed by the Water License (2AM-DOH1323); therefore, creating an ice cover for dust control is not considered a viable practical alternative for application at the Project.

3.3 Physical Methods

3.3.1 Water – Surface Wetting

Water is by far the most common temporary dust control measure used in areas where water shortage is not of concern. The exposed surface is wetted up, preventing particles from becoming airborne. Since the water rapidly evaporates (in a matter of hours or days), it needs to be reapplied at a frequent interval to be effective. The surface wetting can be done using a conventional water truck, a water cannon fitted to a water truck, or a stationary sprinkler system. Naturally this dust control method is only applicable during non-freezing periods of the year.

For the Project, water could readily be obtained from the Reclaim Pond or can be hauled via water truck from other site contact water ponds. The tailings surface is however not expected to be trafficable in the short term and the only viable means of frequent tailings wetting would be via a water cannon, or a sprinkler system. While both of these methods are viable, the short useful life of every wetting cycle makes this a very labor intensive dust control method which is not preferred. This method will however be reserved as a last line of defence should any of the other dust control methods prove to be ineffective.

3.3.2 Water – Flooding

Flooding the tailings surface will naturally preclude any dust concerns. This is however not a viable strategy for the Project since the objective is to place tailings subaerially. At Doris, TIA portions of the tailings may be seasonally flooded as the water level in the Reclaim Pond rises; however, the water level will be managed such that a perpetual water cover will not be present.

3.3.3 Permanent Dry Cover

The most effective permanent dust control system is a permanent physical dust cover. Typically this is in the form of a layer of soil, or other suitable readily available cover material. This is however not practical until the tailings surface has reached its final elevation. In order to facilitate placement of a final dust cover as expediently as possible, any tailings deposition plan should be designed taking into consideration all opportunities for progressive reclamation.

In the context of the Doris TIA, the tailings deposition plan provides limited opportunity for progressive reclamation during the early Project life. This is predominantly driven by the surface topography and as a result there are no practical means to improve the design. The only viable permanent dust cover would be geochemically suitable waste rock, or quarry rock. Since all the Project waste rock is designated for use as structural underground backfill, only quarry rock can be considered a viable source for a permanent dust cover. While this will be the final closure dust control method, it is not considered a viable method during the operational phase of the Project.

3.3.4 Sacrificial Dry Cover

In extreme cases, nominal sacrificial covers such as a layer of sand or gravel are used to manage tailings dust when the final tailings surface has not yet been reached, but the period until tailings

deposition might resume at any particular spot may be extensive. When tailings deposition eventually returns to the covered area, these materials are not removed and tailings deposition proceeds to overtop the sacrificial cover. This can be very cost intensive and will only be practical if the tailings surface is readily trafficable.

There are no suitable natural sacrificial cover materials readily available at the Project site. Gravel could be produced from quarry rock; however, at great cost. This is therefore not considered a viable dust control strategy for the Project TIA.

3.3.5 Biodegradable Cover

Biodegradable material such as hay, wood mulch or sewage treatment sludge can be applied over exposed tailings surfaces to mitigate dust for a limited period (i.e. requiring occasional reapplication). Naturally this option is only economically viable if the organic source is readily available. The tailings surface must also be sufficiently trafficable to allow equipment to spread these materials. As these materials biodegrade and dry out, they themselves become prone to being part of the dust hazard.

There is no viable source of biodegradable materials at the Project site, and therefore this is not considered a viable dust control strategy for the Project.

3.3.6 Wind Barriers

A wind barrier (aka windbreak or shelterbelt) is a physical structure used to reduce the wind speed, which will reduce tailings from being re-mobilized from the TIA. Typically, a wind barrier consists of one or more rows of trees or shrubs. Trees and shrubs don't grow at the Project site (at least not to the size where they would be effective wind barriers), therefore, any wind barriers would have to be engineered structures. The efficiency of wind barriers is also a function of wind speed, and often, at very high wind speeds, wind barriers can fail since it is simply not cost effective to design and build these structures to withstand large wind velocities. As well, wind barriers only work effectively over a very narrow range of wind directions. Multiple wind barriers would need to be installed to cover all of the Project's prevalent wind directions so as to provide a comprehensive dust management system for the TIA.

Given the very high wind speeds and the multiple wind directions, experienced at the Project's TIA, engineered wind barriers are not be considered a viable dust control strategy for the Project's TIA.

3.3.7 Vegetation

Revegetating an exposed tailings surface is a very effective way to mitigate dust. In an arctic setting such as at the Project site, this is not a practical option since the growth season is simply too short to allow for rapid onset of effective vegetation. In addition, the tailings material may not be amenable to supporting vegetation without the addition of supplemental nutrients, which might preclude establishment of natural successional vegetation species. This is therefore not a viable dust control method for the Project.

3.4 Chemical Methods

3.4.1 Salt (Calcium Chloride)

"Salted" sand will not freeze at temperatures above -10˚C, and can be spread in a thin layer over exposed frozen tailings surfaces during the shoulder seasons when frost penetration is enough to support the spreader truck (or other suitable spreader mechanism). The calcium chloride in the sand acts to melt the frost on the exposed tailing surface and stops the fine particulate dust particles from becoming airborne.

There are no sources of sand at the Project site, requiring that both sand and salt would have to be imported at great cost. As runoff occurs from the tailings surface, the salt will dissolve reducing the efficiency; however, since this mitigation method is best used during freezing conditions this risk is limited. However, during freshet the salt is washed off towards the Reclaim Pond which results in an increased salt load to the TIA, which may limit the use of TIA reclaim water to the mill. This is therefore not a viable dust control strategy for the Project TIA.

3.4.2 Chemical Suppressants

There are many environmentally safe commercial chemical dust suppressants on the market. Although originally developed for other forms of fugitive dust management, they are routinely used for dust control on tailings surfaces. These products work in different ways, but principally they all either chemically bind dust, or alternately facilitate towards development of a crust to prevent particles from separating and becoming airborne.

The chemical suppressants are normally supplied in concentrated liquid form in containers of various sizes. They are typically water based and are diluted before application at a ratio of about nine parts water to one part suppressant. The solution is applied by means of a spray cannon mounted on a modified water truck, but can also be done via hand held sprayers. The application rate is typically about four liters per square metre.

Chemical suppressants have a useful life which is dependent on the concentration applied and local weather conditions. Normally, products are applied at a concentration which would render a useful life of approximately one year.

Of all the dust control methods, chemical suppressants offer the greatest flexibility for application at the Project TIA. The concentrated liquid can be shipped to site on an annual basis and solution can be mixed an applied on site as required. The relatively long useful life limits the amount of effort that needs to be exerted and therefore makes the dust control method practical.

4 Dust Control Procedures for Tailings

The primary dust control measures of the Project site tailings facilities will be the use of environmentally suitable chemical dust suppressants. The application of these suppressants will be reviewed on an ongoing basis to ensure that any areas that may be at risk will be adequately covered. Generally, annual application of chemical suppressants will be applied; however it is recognized that more frequent applications may be required as discharge locations are changed throughout any year.

In addition to chemical dust suppressants, natural dust control in the form of packed snow when available will be used as far as practical. Again, the effectiveness will vary on a year by year basis depending on how deposition points vary for any given winter season.

Finally, if for any reason, any of the above dust control methods prove to be temporally ineffective, a suitable water cannon will be available to allow for dust suppression in the form of spraying of the areas of concern.

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The opinions expressed in this report have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

OPERATIONS, MAINTENANCE AND SURVEILLANCE MANUAL: HOPE BAY DORIS TAILINGS IMPOUNDMENT AREA

HOPE BAY, NUNAVUT

Appendix C: AEM Preferred Dust Control Product

Dust Stop Municipal Blend

100% Environmentally Friendly Non-Corrosive, Non–Toxic Cost Competitive Dust Control

Dust Stop Municipal Blend (DSMB) is a formula consisting of natural organic ingredients specifically engineered for all types of unpaved roads. Applicable to any soil type, it is applied using standard equipment and techniques. DSMB was designed to provide an environmentally friendly, non-corrosive and cost-competitive replacement for calcium and magnesium chloride. DSMB is not adversely affected by heavy rains or long periods of dry weather and has no adverse effect on the environment or vehicles, due to its non-corrosive properties.

- **Significantly reduces long term maintenance costs**
  - » Reduced need to grade treated roads
  - » Reduction in watering requirements
- **Non-corrosive and environmentally friendly**
  - » Will not cause rust on vehicles or application equipment
  - » No adverse impact on roadside vegetation
- **Increased water resistance resulting in better performance in all weather conditions**
  - » Reduction in maintenance requirements as a result of wet weather
  - » Does not get slippery when wet
- **Long lasting results**
- **Cost Competitive with chlorides**
- **DSMB treated roads show improved engineering properties**

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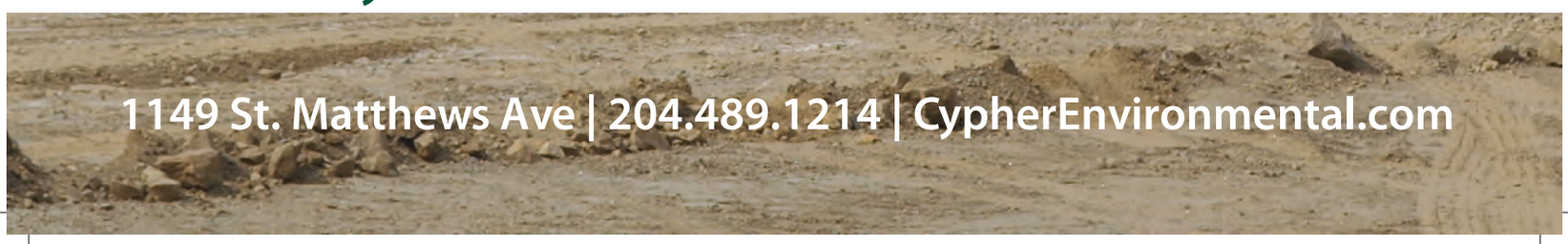

Dust Stop Municipal Blend

100% Environmentally Friendly Non-Corrosive, Non–Toxic Cost Competitive Dust Control

- **Haul Roads**
- **Access/Secondary Roads**
- **Logging Roads**
- **Construction Sites**
- **Parking Lots**
- **Back Lanes and Trails**
- **Tarmacs, Runways & Helipads**
- **Erosion Control**

Testimonial

"We have recently applied Cypher Environmental's new Dust Stop Municipal Blend (DSMB) product on La Verendrye Road within the municipality. DSMB was advertised to be competitive with chlorides in terms of cost and effectiveness and so far has performed well and exhibited excellent properties during and after rain. The product has stood up to the elements very well thus far, with several periods of rain and hot, dry and windy weather."

Grant Baker, Public Works Manager,
Rural Municipality of MacDonald, Manitoba

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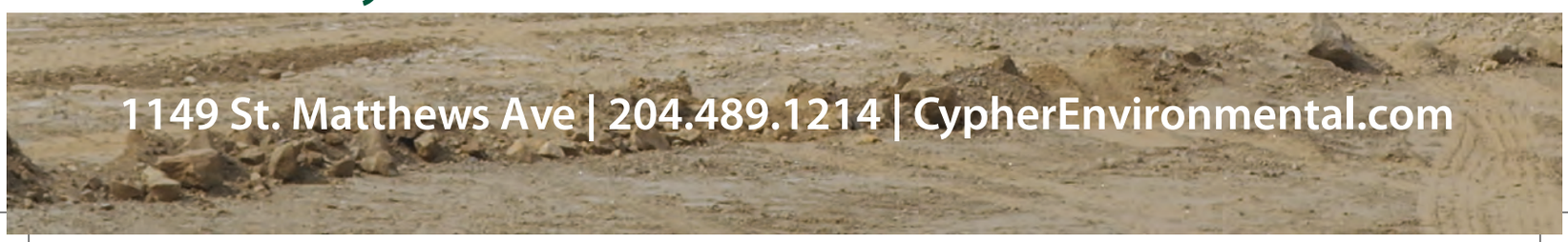


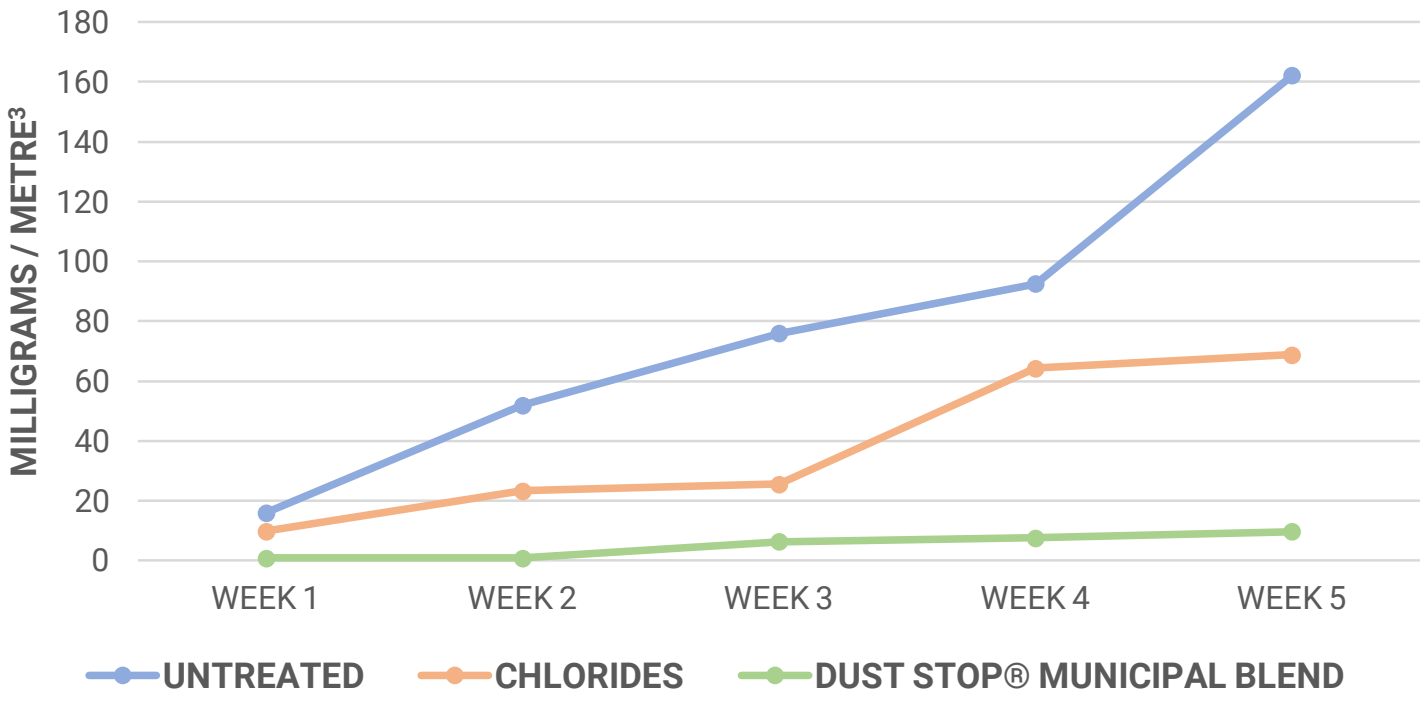
Superior dust control.

DUST STOP®
MUNICIPAL BLEND

REDUCE DUST POLLUTION BY UP TO 90% WITH DUST STOP® MUNICIPAL BLEND.

In order to measure the effectiveness of the dust control properties of Dust Stop® Municipal Blend, data was collected from a Turnkey® Dust Mate environmental dust detector during a series of controlled road tests over the period of several weeks. The Dust Mate Remote Vehicle Probe was installed on the wheel-well of our company vehicle, and dust concentration data was collected while controlling the speed of the vehicle and the elapsed time of each test. This data was collected on three road surface types on the same stretch of road (Untreated, Chlorides & Dust Stop® Municipal Blend) under the same conditions. These conditions included direction of travel, speed of travel, wind speed, wind direction, temperature, road conditions and traffic frequency.

AERIAL DUST CONCENTRATION



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Dust Stop Municipal Blend – How It Works

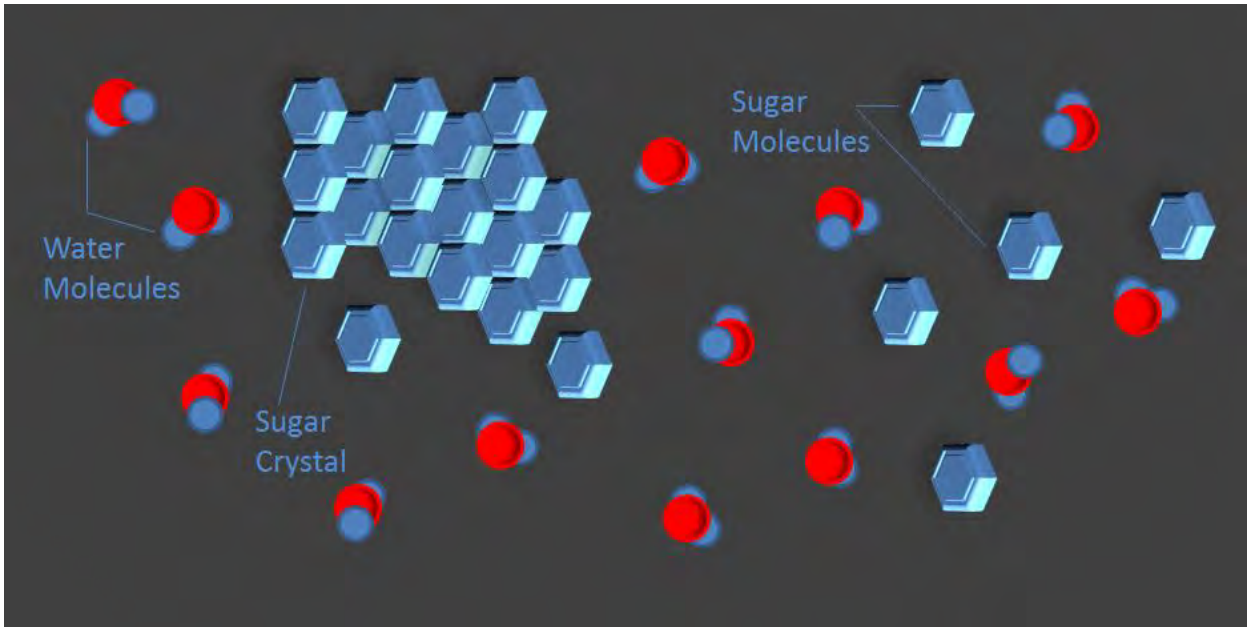
Introduction

Dust Stop Municipal blend contains three main constituents; sugars, starches, and minerals. These components are all commonly found in nature and play a big role in our everyday lives. Sugar is the universal term for sweet, short-chain, soluble carbohydrates that are primarily composed of the elements carbon, hydrogen, and oxygen. Sugars can be derived from multiple sources; simple sugars are called monosaccharides and include glucose (also known as dextrose), fructose, and galactose. Granulated sugar which is most customarily used in the food industry is sucrose, also known as a disaccharide.

The building blocks of Sugar- Greatest binding influence in DSMB

Hydrogen bonding is the greatest contributing factor to sugar's stickiness. When sugars are crystalline in structure they are unable to stick to other molecule but can be easily dispensed or poured. When a liquid such as water is added to crystalline sugar, the formerly strong oxygen-hydrogen bonds will begin to degrade and cause the newly available hydrogen atoms to seek out other materials to bind to.

Available hydrogen atoms have an opportunity to stick to the closest surfaces, some will be attracted to the hydrogen molecules in the liquid, and some will bind with another available hydrogen or oxygen atom present in the sugar. This bonding action results in the sticky nature of sugar. When the bonds in sugar are broken there is more opportunity for the molecules to grab onto whatever they're in contact with, including other sugar molecules and surrounding particles. The new bonds are more secure because there are so many of them. Therefore, it's harder to pull them apart.



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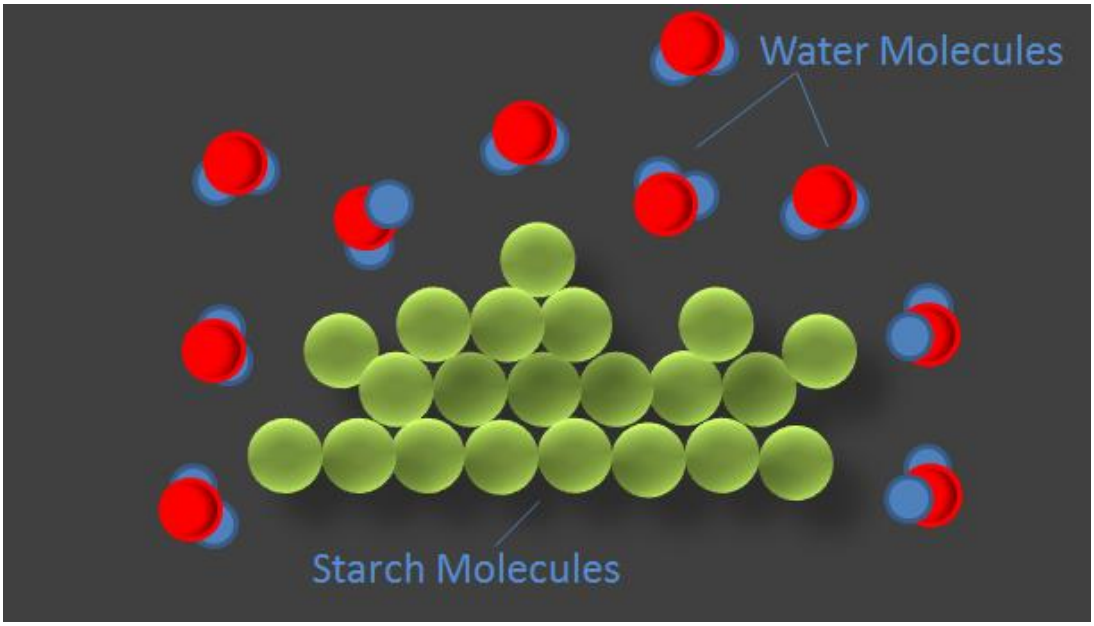
Starches and Minerals

Starch is a term with the following meanings “strong, stiff, strengthens, stiffen". Starches are comprised of polymeric carbohydrates consisting of a large number of glucose units joined by glycosidic bonds. They are insoluble in cold water and alcohol due to two types of molecules: the linear and helical amylose and the branched amylopectin. The minerals incorporated in DSMB are not unlike starches, due to their strong chemical makeup they are insoluble in water and have the opportunity to form bonds with other available molecules providing further strength and durability when applied. The bonds fashioned between the minerals, starches and sugars are, in most cases, stronger than the bond that would be formed between these components and water. Consequently, they are less likely to be dissolved or run of with the application of water.



How DSMB works

The unique blend of materials utilizes the functional properties of sugars, starches, and minerals allowing DSMB to bind and harden any loose particulate matter, decreasing dust on surfaces. DSMB is applied in a diluted form; water evaporates from the product as it dries. Dust control is achieved during this process as the high-viscosity, naturally adhesive material traps loose particulate.

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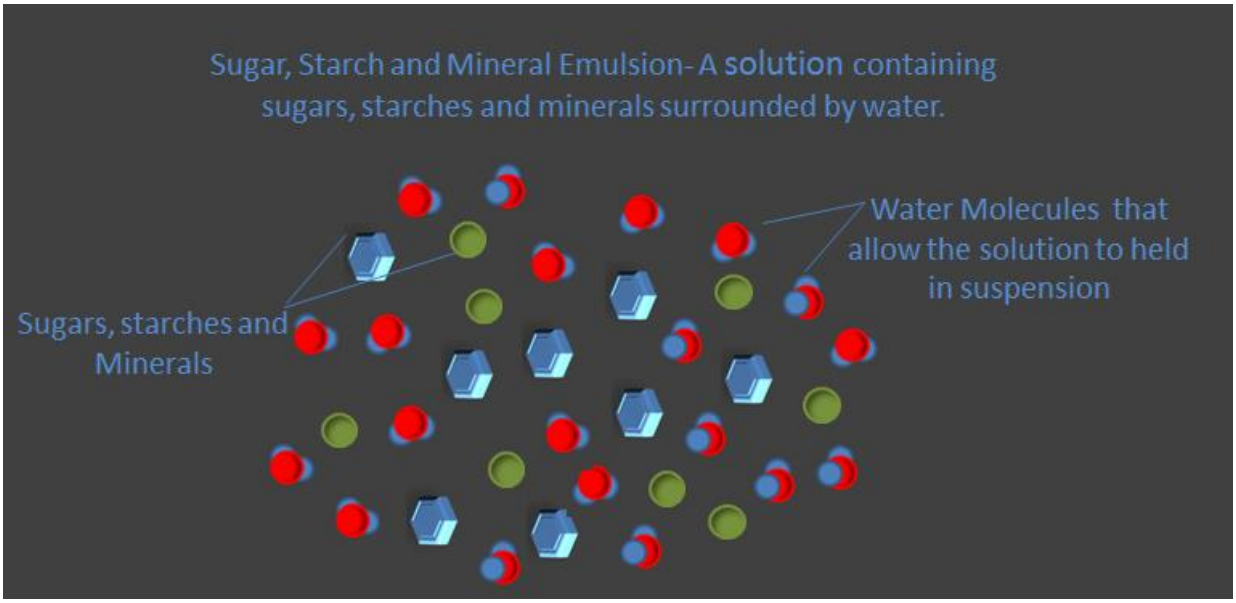
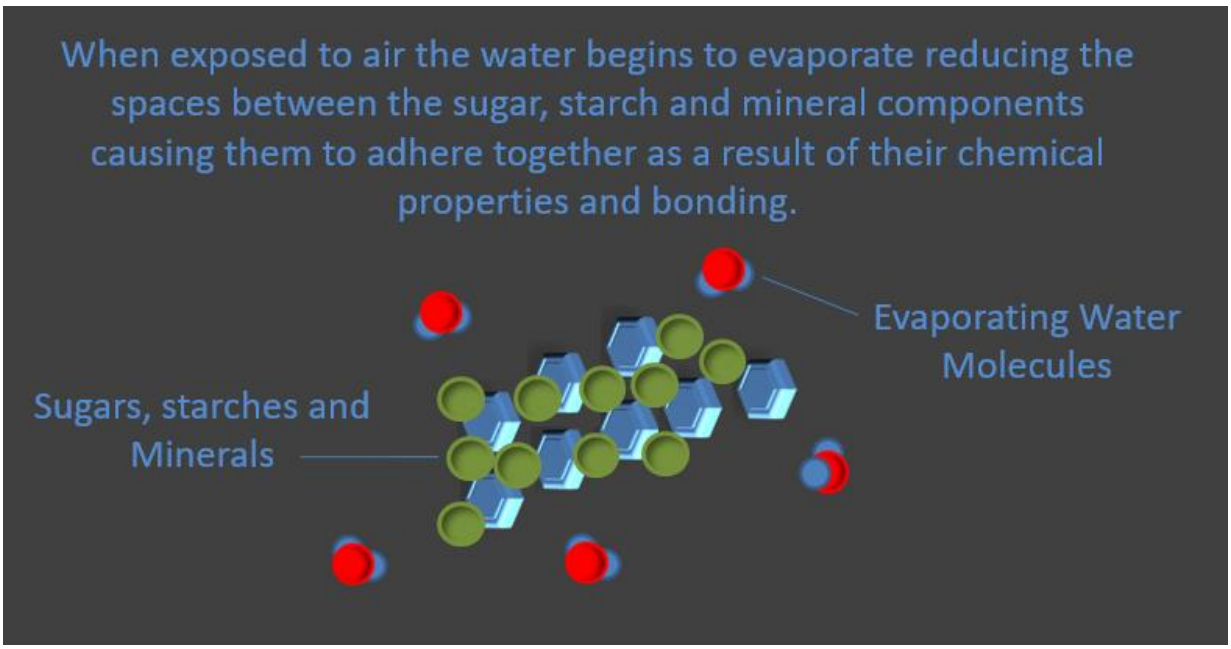
1) Water is added to the highly concentrated product allowing for suspension of the active inputs; sugars, starches, and minerals.



2) As water evaporates, the molecules bind together to form a cohesive matrix.



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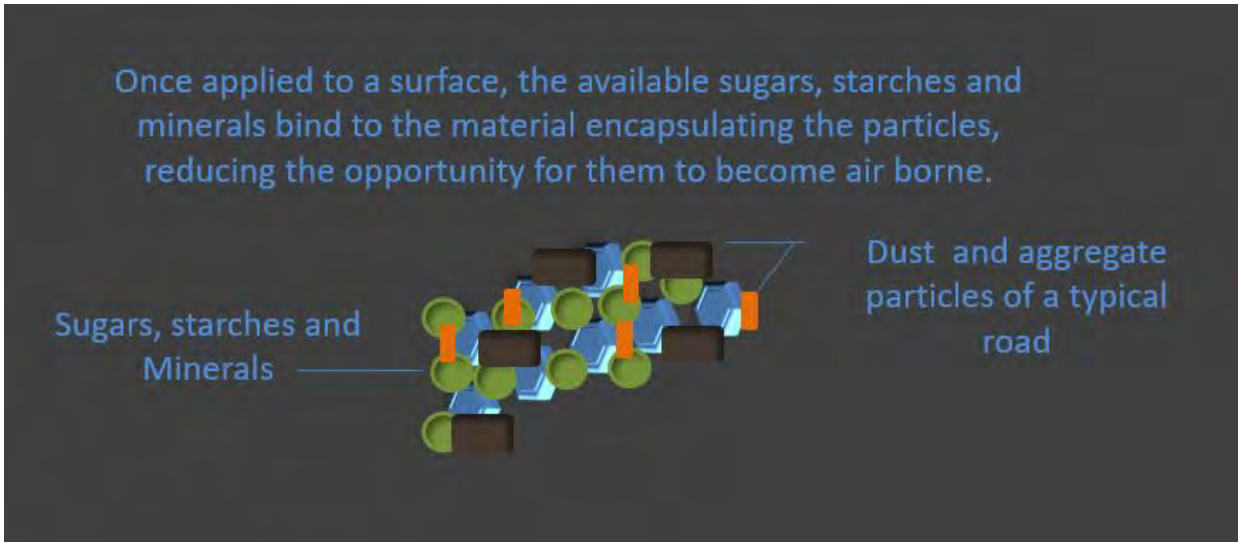
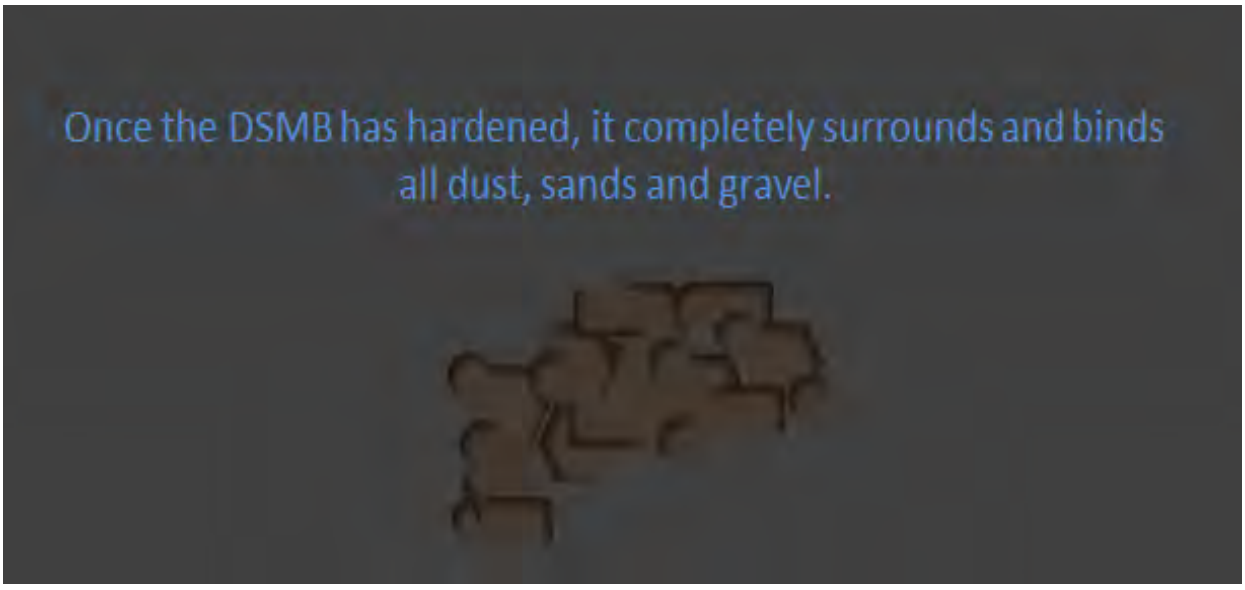
3) The newly formed matrix will now function to attract and bind the loose soil, dust or other particulates that may otherwise become air born and create dust.



4) Over time; as more water evaporates, the solution becomes firm and durable preventing any of the encapsulated dust generating material from becoming air born.



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The product's unique blend of materials also functions to reduce road surface issues in the rain or in wet conditions. The incorporated sugars compete for water making it less available to bind with other soil molecules while providing some minimal structural support and added road stability. The insoluble mineral component forms a bond with the sugar molecules creating some means of insolubility and will have less of a chance to run off in wet conditions. Once wet, the product will re-set once road surfaces dry, re-binding any loose materials. For these reasons, DSMB is not adversely affected by heavy rain, yet very effective and long lasting in dry weather, with no adverse effects on the environment or vehicles using the road due to its non-corrosive properties.

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DUST STOP MUNICIPAL BLEND (DSMB)

FREQUENTLY ASKED QUESTIONS

1) Why use Dust Stop Municipal Blend for dust suppression on your roads?

Dust Stop Municipal Blend should be used on your roads because it is a non-corrosive and environmentally friendly alternative to chlorides. Dust Stop Municipal Blend is not only environmentally friendly and non-corrosive, but also highly effective on a variety of road and material types, applied using standard techniques and equipment, and does not run-off or get sticky in the rain. Products such as various oil based emulsions and chloride based products (magnesium chloride / calcium chloride) have been used in the past for dust suppression at the expense of the environment (Canadian Environmental Protection Act 1999-link below), none of which is a concern for Dust Stop Municipal Blend. The product is based on organic sugar and starch ingredients, as well as a proprietary mineral compound, providing effective dust control with no adverse impact on the environment.
http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/psl2- lsp2/road_salt_sels_voirie/index-eng.php#a02

2) What is the difference between Dust Stop Municipal Blend and other products on the market?

Dust Stop Municipal Blend is specifically designed as a non-corrosive and environmentally friendly alternative to other dust control products such as magnesium chloride, calcium chloride, offering superior road dust control results. Dust Stop Municipal Blend is very cost-competitive with road salts, while being able to very effectively eliminate unwanted fugitive dust from unpaved roads of any soil type. While road salts are minimally effective, they are hygroscopic by nature, meaning they require moisture, which they attract to the road, to be effective, and are therefore not effective during long periods of dry weather, and can also run-off in the rain. Dust Stop Municipal Blend is not hygroscopic, so it is not burdened with the same issues road salts have during prolonged dry periods, or wet weather. The concentrated liquid formulation is easily mixed with several parts water prior to its application, allowing it to be easily transported and applied with standard water trucks. Once the solution is sprayed on the road and allowed to dry, immediate dust control results will be achieved. In comparison to other dust control products mentioned above, Dust Stop Municipal Bend requires a reduced application frequency further reducing application and maintenance costs.

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3) What is Dust Stop Municipal Blend made of?

Dust Stop Municipal Blend's proprietary formula is composed of an environmentally friendly blend of sugars, starches and minerals. Dust Stop Municipal Blend utilizes these main inputs in a concentrated liquid form to produce a very effective dust control product that is applicable to almost any material type.

4) How does Dust Stop Municipal Blend work?

The unique blend of materials utilizes the functional properties of sugars and starches allowing DSMB to bind and harden any loose particulate matter, decreasing dust in road surfaces. The product's unique blend of materials also functions to reduce road surface issues both during and after rain. The incorporated sugars compete for water making it less available to bind with other soil molecules, while providing some minimal structural support and added road stability. The product will re-set once road surfaces dry, re-binding any loose materials. For these reasons, DSMB is not adversely affected by heavy rain, yet very effective and long lasting in dry weather, with no adverse effects on the environment or vehicles using the road due to its non-corrosive properties.

5) What are the benefits of Dust Stop Municipal Blend?

Dust Stop Municipal Blend has numerous benefits associated with its use as a dust control product. Dust Stop Municipal Blend is supplied in concentrated liquid form, allowing for easier transportation as well as application. The ingredients in the product provide stability to the road surface that decrease maintenance requirements and significant dust reduction. The unique blend of materials utilizes the functional properties of sugars and starches allow DSMB to bind and harden any loose particulate matter, decreasing dust on road surfaces. These materials function to reduce road surface issues in both dry and wet conditions. Once wet, the product has the ability to re-set once the road surface becomes dry, re-binding any loose materials. Due to the specific blend of sugars and starches, it will rejuvenate with moisture allowing it last longer than other products on the market, yet not run-off in the rain. For these reasons application and maintenance costs can be reduced. Dust Stop Municipal blend is non corrosive, will not cause corrosion to equipment or vehicles and does not have any harmful effects to roadside vegetation making it safe to use in sensitive environmental areas.

6) What kinds of roads is Dust Stop Municipal Blend applicable for?

Dust Stop Municipal Blend is an effective dust control product on any unpaved roads or surfaces requiring dust suppression and temporary soil stabilization. Dust Stop Municipal Blend is effective on municipal roads, secondary roads, county roads, mine haul roads, access roads, runways, helipads, parking lots, driveways and a wide range of other applications that require dust suppression or temporary stabilization such as tailings piles, stockpiles, erosion control and open haulage situations.

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7) How do you apply Dust Stop Municipal Blend?

Dust Stop Municipal Blend is applied with standard road construction equipment and can be applied topically or mixed into the top layer of the road material. The first step involved in the application of Dust Stop Municipal Blend is to determine the area of the road / surface that you will be treating. Once you determine this you can calculate the amount of water and Dust Stop Municipal Blend that is required (please communicate with your local representative who will help you figure out the best application rate for your requirements). The next step in the application of the product is to add the Dust Stop Municipal Blend with water prior to the application of the product. Always add the water to the water truck prior to the Dust Stop Municipal Blend. Once the pre-determined amount of water is added to the truck, add the pre-determined amount of Dust Stop Municipal Blend. Once the product is added to the water truck it can immediately be sprayed on the road surface. Once the product is applied you will notice dust control results immediately, however traffic should stay off of the road until the product has time to dry (drying time can vary depending on the climatic conditions on the day of application, in many cases is around 1 hour on a warm day).

If mixing the product into the road surface, the addition of a road grader and rubber wheeled compactor needs to be added to the project. Generally performed during routine maintenance, the DSMB can be mixed into the soil once the top layer has been loosened to repair potholes and wash boarding. The prescribed mixture of water and DSMB should be applied evenly and lightly mixed into the soil prior to shaping and compacting. Shaping of the road surface is still important to ensure that water is quickly evacuated away from the road surface. Additional details and specifics can be discussed with your Cypher representative.

8) What happens to Dust Stop Municipal Blend when it rains?

There are no long term effects on Dust Stop Municipal Blend if it is subjected to rain. Dust Stop Municipal Blend contains a blend of soluble sugars, starches, and an insoluble mineral component that once cured are able to hold their strength in the presence of water. For these reasons, DSMB is not adversely affected by heavy rain, yet very effective and long lasting in dry weather, with no adverse effects on the environment or vehicles using the road due to its non-corrosive properties.

9) Is Dust Stop Municipal Blend effective during long periods of dry weather?

Yes, Dust Stop Municipal Blend is an effective dust control product during long periods of dry weather. One reason Dust Stop Municipal Blend is so effective in dry weather is that, unlike chloride-based products, it is not hygroscopic so it does not rely 100% on the ambient moisture in the atmosphere to work. The product derives its main efficacy through the hardening and binding power of its ingredients, which forms a physical barrier over the surface of the road, binding the dust particles down and providing long term dust control results.

10) Is Dust Stop Municipal Blend effective on all material types?

Yes, Dust Stop Municipal Blend is an effective dust control product on almost any material type. Dust Stop Municipal Blend will bond to any solid material it is exposed to, it will incorporate any particles it touches into the film once it cures. Therefore, almost any soil type can be treated with Dust Stop Municipal Blend. However, the application rate of Dust Stop Municipal Blend that is recommended may vary slightly depending on the material being treated.

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11) How long will Dust Stop Municipal Blend last?

Dust Stop Municipal Blend is a seasonal dust control solution, designed to reduce the frequency of treatments compared to other dust control methods, such as chlorides. Some variables that will affect the longevity of an application would be the application rate used, type of material, wet/rainy conditions, type and amount of traffic and climatic conditions. The application rate will have an effect on the longevity of dust control results you see; the stronger you apply Dust Stop Municipal Blend the longer it will last. Some Dust Stop Municipal Blend users apply it at rates that are much less concentrated and on a more frequent basis, therefore in essence making these applications maintenance doses and allowing for a more cost-effective long-term use of the product.

12) Will Dust Stop Municipal Blend have any adverse effects on the vehicles used to apply it?

No, Dust Stop Municipal Blend will not have any adverse effects on either the vehicles used to apply the product or the vehicles using the road. Dust Stop Municipal Blend has a pH that is almost neutral which is why it will have no corrosive effect on any vehicles it comes into contact with, or any damaging effect to road side vegetation. In fact, Dust Stop Municipal Blend 's use as a dust control product will eliminate harmful dust from having an abrasive effect on the moving parts of the vehicles traveling on the Dust Stop Municipal Blend treated roads therefore reducing their associated maintenance requirements. It is unlike corrosive and toxic products such as chlorides, it will not cause irreversible long term damage to equipment and vehicles.

13) Why use a dust control product?

Dust control should be used to minimize the risks involved with the generation and movement of dust particles emanating from any trafficked unpaved surfaces. Dust also represents the fines that are the essential binders that maintain the strength and stability of an unpaved surface, and help to lock down the aggregate road. It is estimated that for every vehicle traveling one mile of unpaved roadway once a day, every day for a year, one ton of dust is deposited along a corridor extending 500 feet out on either side of the road. This dust poses a threat to human health through inhalation into the lungs, as well as a threat to the safety of the people using the road due to the reduced visibility caused by the thick clouds of dust. The creation of dust is also quite costly because it represents significant annual losses in fine soil material and can cause damage via abrasion to moving parts of the vehicles traveling on the road. Applying a dust suppressant / dust control product, such as Dust Stop Municipal Blend, will help to minimize these threats and provide a much safer, healthier road environment.

Additional information can be found at www.cypherenvironmental.com. For questions, contact your regional distributor or Cypher Environmental Ltd.'s head office at info@CypherEnvironmental.com.

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DUST STOP LIQUID CONCENTRATE (DSLC) QUESTIONNAIRE DEFINITIONS

Cypher environmental prides itself in providing a customized approach to every project; we know that no two projects are the same, understanding the variables such as size, project type, material type, traffic frequency and traffic type are paramount to providing the best solution.

A significant amount of time and effort is placed on providing the best solution for the issue of dust control based on the circumstances of a particular project. Areas such as dimensions of the project are easily determined while others such as traffic type and traffic frequency are somewhat subjective. In order to provide some framework for understanding these terms, Cypher provides the following reference information:

Road Type:

Mine Haul	– A crude road built to facilitate the movement of people, equipment, and/or materials along the route of a job. – A road built to carry heavily loaded trucks (60-450 ton) at a good speed; the grade is limited and usually kept to less than 17% of climb. – Truck haulage cost amounts to between 30 and 50 per cent of total surface mining costs and up to 60 per cent of total forestry operation costs. The savings from appropriate design, construction and maintenance of haulage roads and utilization of the most suitable materials is thus significant.
Access Road	– A road providing a means of entry into a region or approach to another road, site or project; usually exposed to heavy traffic (not as significant as a haul road). – A road that provides access to a specific destination, as to a main highway or to a property that lies within another property.
Secondary Road	– A road supplementing a main road, usually wide enough and suitable for two-way, all-weather traffic at moderate or slow speeds (lighter vehicles than an access road).
Parking Lot	– A cleared unpaved area that is intended for parking vehicles, these surfaces can be exposed to additional shear forces not found on other road types due to static shear (static wheel forces when steering while stopped).
Erosion Control	– Is the practice of preventing or controlling wind or water erosion in agriculture, land development, coastal areas, river banks and construction. – Effective erosion controls are important techniques in preventing water pollution, soil loss, wildlife habitat loss and human property loss.

Tailings Pile	– Any static pile of material that is not exposed to vehicle or foot traffic. – Also includes storage piles.

Material Type:

The **Material Type** is a reflection of the size of the dominant aggregate particles in a road / soil, starting at the small end of the scale; Well Compacted Fines and getting larger as we reach the High Gravel Content end of the scale.

Sandy	– Granular material. – Finer than gravel and coarser than silt. – Particles range in diameter between 0.0625 mm to 2mm.
Well Compacted Fines	– High clay / silt content. – Cohesive soils (clay / silt) that are dense and tightly bound together.
Light Gravel Content	– Fine Sized / Dirty Gravel (more fines). – This is small (4–8 mm) particulate gravel.
Medium Gravel Content	– Medium Sized / Less Dirty (less fines). – This is medium (8-16 mm) particulate gravel.
High Gravel Content	– Coarse Gravel (Little to No Fines – difficult to compact) – This is larger (16-32 mm) particulate gravel.

Traffic Frequency:

The area i.e. dimensions of the surface are easily determined while other variables such as traffic type and traffic frequency are somewhat subjective. In order to provide some framework for understanding these terms, Cypher provides the following reference information:

Traffic Frequency	**Per hour**	**Per 8 hour**	**Per 12 hour**	**Per 24 hour**
Low	1 – 10	1 – 80	1 – 120	1 – 240
Medium	10 – 25	80 – 200	200 – 300	240 – 600
High	> 25	> 200	> 300	> 600
Constant	– Traffic that exceeds the 25 vehicles per hour and remains at a steady state for extended periods. Generally, traffic numbers are averages over a long period, encompassing high and low traffic periods. Constant traffic indicates regular passage of vehicles at stable intervals for long periods (e.g. every 2 minutes for 24 hours a day).			
Tailings Pile	– Any static pile of material that is not exposed to vehicle or foot traffic. – Also includes storage piles			

Traffic Type:

Traffic Type	Vehicle Weight (tons)	Vehicle Weight (kg)	Vehicle Weight (lbs)
Heavy	> 100	> 100,000	> 220,463
Medium	22 – 100	22,000 – 100,000	48,500 – 220,462
Light	< 22	< 22,000	< 48,500
Tailing Pile	– Any static pile of material that is not exposed to vehicle or foot traffic. – Also includes storage piles.		

Average Traffic Speed:

This represents the speed at which the majority of vehicles will travel on the road. Choose "Tailings Pile" for any projects that will not receive any traffic.

**Note that these definitions are for general familiarity; all roads will have a mixture of various sized aggregates in them but will have a visible maximum aggregate size that we are referring to here. If you are uncertain about the category of a road, a picture of the surface should be emailed to your Cypher representative for clarification.
**This information is provided as a guide only, specifics of the project should be discussed with your Cypher representative to clarify individual project details.

Dust Stop Municipal Blend

SECTION 1: IDENTIFICATION

Product Name:	Dust Stop Municipal Blend
Synonyms:	DSMB
CAS Number:	See Section 3
Product Use:	A water-based nonhazardous, environmentally friendly and biodegradable liquid used for dust control on roads
Manufacturer/Supplier:	Cypher Environmental Ltd.
General Information:	WHMIS Classification: Not Controlled
Address:	Cypher Environmental Ltd. 1149 St. Matthews Ave. Winnipeg Manitoba R3G 0J8 Canada
Emergency Number:	Tel: (204)-489-1214 Fax: (204)489-7372

Section 2: HAZARD IDENTIFICATION

Health Environmental Physical:	Biodegradable
Acute Toxicity:	Non- Toxic, pathogen free.
Skin/Eye Corrosion:	Contact with skin may result in mild irritation.
Mutagenicity/ Carcinogenicity/Devel opmental:	Non-mutagenic and non-carcinogenic Based on available information, none of the ingredients in Dust Stop Municipal Blend are regulated nor listed as potential cancer agents by Federal OSHA, NTP or IARC.
Reproductive/Develop mental:	Not Determined
Target Organ Toxicity (Repeated):	Not Determined
Toxicity:	Non-Toxic, pathogen free

GHS Label:

Signal Word: DANGER!

Hazard Statements:

WHMIS HAZARD RATING INFORMATION	FLAMMABILITY	HEALTH	REACTIVITY
0-Minimal 1-Slight 2-Moderate 3-Serious 4-Severe	0	1	0

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Unique Identifiers

INGREDIENTS (Complex mixture)	% by weight	CAS NO.
Water	5-10	-
Proprietary Anionic Polyelectrolyte Additive	Proprietary	CAS Listed
Proprietary Additive	Proprietary	CAS Listed
Reduced Sugars	Proprietary	CAS Listed
Silicates and Carbonates	Proprietary	Mixture

* Based on available information, none of the ingredients in Dust Stop Municipal Blend are regulated nor listed as potential cancer agents/hazardous by Federal OSHA, NTP or IARC.

Section 4: FIRST AID MEASURES

Eye: A slight eye irritant.

Skin: Contact with skin may result in mild irritation, rinse with plenty of water.

Inhalation and Ingestion: Considered non-harmful by all exposure routs , if breathing is difficult remove to fresh air.

Signs and Symptoms of Exposure: None. Ingestion may cause mild nausea or diarrhea.

Section 5: FIRE FIGHTING MEASURES

Suitable Extinguisher Media:	Treat the same as water
Fire Fighting Procedures:	Isolate fire area and deny unnecessary entry, Soak thoroughly with water to cool and prevent re ignition. Cool surroundings with water to localize fire zone. Hand held carbon dioxide or dry chemical hazard may result from forceful application of fire extinguishing agents. Do not enter fire area with out protective equipment.

Section 6: ACCIDENTAL RELEASE MEASURES

PPE:	Eye: Safety goggles Respirator: Not applicable Clothing: Regular on-Site clothing
Emergency Procedures:	In case of accidental spill or discharge, take up and containerize for disposal according to state and local regulations. This product displays ultimate biodegradability under both aerobic and anaerobic conditions and if spilled should not cause any adverse short or long term environmental impacts. Ventilation requirements as normal
Methods and Materials For Containment and Cleaning Up:	For smaller spills, Wash contaminated area with water and flush into sewage system or any other disposal system. For large spills, soak up with sand or sweeping compound and dispose at solid waste

Section 7: HANDLING AND STORAGE

Handling: **Keep container closed when not in use. If container is being stored for extended periods, provide minimal to moderate agitation every few weeks ensuring re-homogenization of product.**

Storage:

Storage Temperature (Degrees C/F)
Minimum: 10°C (50°F)
Maximum: 20-25°C (68-77°F)
Application Temperature:
Minimum: 10°C (50°F)
Maximum: 57°C (135°F)
Optimum Working Temperature Range:
18-45°C (64-113°F)
*Store product in an area that is not exposed to direct sunlight and in an environment within the conditions stated above.

Section 8: EXPOSURE TO CONTROLS AND PERSONAL PROTECTION

OSHA PEL's:	Not Applicable
Exposure Limits:	Dust Stop Municipal Blend presents no health hazards to the user, other than mild eye and skin irritancy.

Engineering Controls:

	No specific engineering controls needed, it is recommended to handle concentrated product in a well ventilated area
PPE:	
Eye Protection:	Safety goggles, avoid eye contact or exposure to concentrated amounts of product
Skin Protection:	Regular on-Site clothing , rinse from skin when exposed to product
Respiratory Protection:	Respirator: Not applicable, ventilation as normal

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Flashpoint:	Not flammable; not combustible
Auto Ignition:	None
Boiling Point:	>100°C
Melting Point:	Liquid
Freezing Point:	<0°C
Vapor Pressure:	Not Determined
Miscibility with water:	Miscible in all proportions
Solubility in Water:	Soluble
Lower and Upper Flammability Limits:	Not flammable
Specific Gravity:	1.24 @ 25 °
Density:	1.4 g/cm^2 @ 25 °
pH:	9.19
Ultimate Biodegradability:	DOC reduction >90% after 28 days
Appearance:	Brown slightly viscous liquid
Odor:	Sweet organic odor
Composition:	A blend of carbohydrates, water-soluble polymers, and solid mineral.

Section 10: STABILITY AND REACTIVITY

Stability/ Incompatibility:	Stable for a minimum of two years when stored in proper conditions (see above section 7)
Hazardous Reactions/Decomposition Products	Not determined
Reactivity:	Not determined
Chemical Stability:	Stable
Conditions To Avoid:	Storage above 50°C (120°F) or below 0°C (32°F). Avoid contact with strong oxidizing and reducing agents.
Incompatible Materials:	None
Hazardous Decomposition Products:	Not determined, None

Section 11: TOXILOGICAL INFORMATION

Signs, Symptoms of Over Exposure and First Aid Treatment:

Eye Contact: Reddening may develop. Immediately rinse the eye with large quantities of cool water. Continue 10-15 minutes or until material has been removed. Be sure to remove contact lenses, if present, and lift upper and lower lids during rinsing. Get medical attention if irritation persists.

Skin Contact: Minimal effects, if any. Rinse skin with water. Rinse shoes and launder clothing before reuse.

Swallowing: Essentially non-toxic. Product may cause a slight laxative condition. Give several glasses of water to dilute if swallowed. Do not induce vomiting. If stomach upset persists, consult a physician.

Inhalation: Non-toxic. Prolonged exposure to product in a mist form (not recommended) could cause a mild irritation of the nasal passages and throat. Remove to get fresh air. Get medical attention if irritation persists.

Section 12: ECOLOGICAL INFORMATION

Bio Accumulative Potential:	The product exhibits ultimate biodegradability under anaerobic conditions as defined by US EPA methods (40 CFR part 796.3180).

Section 13: DISPOSAL CONSIDERATIONS

See section 6

Section 14: TRANSPORTATION INFORMATION

This product is non-toxic, transport in conditions described in section 7 above.
INTERNATIONAL AIR TRANSPORTATION ASSOCIATION: this product is not regulated by IATA, when shipped internationally.

Section 15: REGULATORY INFORMATION

SARA/TITLE III – CERCLA List of Hazardous Substances and Reportable Quantities (40 CFR 304.4): This product **does not** contain an ingredient(s) listed as a hazardous ingredient for Emergency Release Notification under section 304.

SARA/TITLE III – List of Extremely Hazardous Substances for Emergency Planning and Notification (40 CFR 300 & 305): This product **does not** contain an ingredient(s) listed as an extremely hazardous substance (EHS) for Emergency Planning under sections 301-303 and for Emergency Release Notification under section 304.
SARA/TITLE III – List of Toxic Chemical subject to Release Reporting (Community Right to Know) (40 CFR 372): This product **does not** contain an ingredient(s) listed as a toxic chemical for Annual Release Reporting Requirements under section 313.

Section 16: OTHER INFORMATION

Date of SDS Preparation:	August 2016
Original or Revised Copy:	Last Updated August 2016 **Reasonable care has been taken to ensure information and advice contained in this data sheet is accurate at the time of printing. However, Cypher Environmental Ltd. Accepts no liability for any loss or damages suffered as a consequence of reliance on the information contained herein.**
Changes Made to Original SDS:	
Disclaimers:	Please contact the supplier for application instructions, the application rate/procedure may fluctuate depending on specific uses of product and applications.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Adrianne Veters
Cypher Environmental Ltd
1149 St Matthews Ave 2nd Floor,
Winnipeg, MB R3G 0J8
Canada

Date: 29-Sep-2017

SMI/REF: 1707-047

Product: **DUST STOP MUNICIPAL BLEND** *(received 07-Aug-2017)*

Dilution: As received and 10% by volume

BOEING D6-17487 REVISION T

Exterior and General Cleaners and Liquid Waxes, Polishes and Polishing Compounds

Sandwich Corrosion Test	Conforms
Acrylic Crazing Test	Conforms
Paint Softening Test	Conforms
Hydrogen Embrittlement Test	Conforms

Respectfully submitted,

Patricia D. Viani, SMI, Inc.

Sandwich Corrosion Test : Specimen preparation, testing, and interpretation shall be in accordance with ASTM F1110 using the following materials and with the following exceptions:

a. Reagents and materials exception:
   (1). Clad 7075-T6 aluminum alloy in accordance with QQ-A-250/13 (AMS 4049 or AMS-QQ-A-250/13 optional) (2024-T3 Alclad specimens are neither required nor optional.)
   (2) Bare 7075-T6 aluminum alloy in accordance with QQ-A-250/12 (AMS 4045 or AMS-Q-A-250/12 optional) anodized in accordance with BAC 5019 or MIL-A-8625, Type I.
   (3) Anodize shall be sealed. (2024-T3 nonclad specimens are neither required nor optional).
   (4) Distilled or deionized water may be used in place of ASTM F1193, Type IV reagent grade water for control specimens.
   (5) The filter paper may be Whatman No. 5 or equivalent in place of Whatman GFA glass fiber paper.

b. Procedure exceptions:
   (1) The filter paper strips shall be 1 by 3 inches and shall be placed in the center of the sandwiched specimens.
   (2) Each sandwich specimen shall be held together with waterproof tape, with no more than 1 piece of tape (maximum width 0.75 inch) on each of two opposite edges.

c. Interpretation of result exceptions:
   (1) Leaching or lightening of the chromate sealed anodize coating shall not be cause for rejection.
   (2) Deposits or residues from the material being tested that are not products of corrosion of the test panel surface shall not be cause for rejection.
   (3) Special procedure for evaluation of fire extinguishing foams and liquids.

   Panels with very light darkening or staining, which have no obvious metal attack or pitting, may be swabbed (cotton-tipped swabs or cotton gauze) with a 0.26 mole/liter sulfuric acid solution and re-examined. If the coloration is substantially removed and there is no evidence of metal attack or pitting, the condition shall not be cause for rejection. (The 0.26 mole/liter sulfuric acid solution can be prepared by adding 1.5 cc of concentrated sulfuric acid (SG = 1.84) to 100 cc of distilled or deionized water.

   (4) Panels shall have a rating of 1 (no more than 5 percent of the surface area shall be corroded) or better in accordance with ASTM F 1110. The preferred method of determining the corroded area is by using image analysis. Other means approved by the purchaser may be substituted.
   (5) Any corrosion in excess of that shown by the control group shall be cause for rejection.

Sandwich Corrosion Test :continued

	Bare 7075-T6 (AMS 4045) Anodized per BAC 5019 (chromate seal) or MIL-A-8625 Type I with Dichromate Seal	Clad 7075-T6 Aluminum (AMS 4049)
CONCENTRATE	**1**	**1**
DILUTE	**1**	**1**
CONTROL	1	1

Result Conforms

Acrylic Crazing Test:

The material being tested shall not craze, crack, or etch acrylic test specimens when tested in accordance with ASTM F 484 using Type C (stretched acrylic plastic in accordance with MIL-P-25690) stressed to an outer fiber stress of 4500 psi.

Type C (MIL-P-25690) ***Concentrate: No crazing, cracking or etching.***
Dilute: No crazing, cracking, or etching.

Result Conforms

Paint Softening Test Procedure:

a. Testing shall be in accordance with ASTM F502 using the following coating systems.
   (1) BMS 10-79, Type II primer applied in accordance with BAC5882 plus BMS 10-60, Type II enamel in accordance with BAC5845.
   (2) BMS 10-79, Type III primer applied in accordance with BAC5882, plus BMS 10-100 coating in accordance with BAC5797.

b. Three specimens conforming to Section 12a.(1) and three specimens conforming to Section 12a(2) shall be used for each test condition.

c. The material being tested shall not produce a decrease in film hardness greater than two pencils, or any discoloration or staining.
   NOTE: Slight darkening of the BMS 10-100 surface is acceptable.

Concentrate: *Paint system 1: ≤ 1 pencil hardness change after 24 hour post-exposure dry time.*
Paint system 2: ≤ 1 pencil hardness change after 24 hour post-exposure dry time.

Dilute: *Paint system 1: ≤ 1 pencil hardness change after 24 hour post-exposure dry time.*
Paint system 2: ≤ 1 pencil hardness change after 24 hour post-exposure dry time.

Result Conforms

Hydrogen Embrittlement Test:

Hydrogen Embrittlement testing shall be in accordance with ASTM F 519 using cadmium plated Type 1a.2, Type 1c, or Type 2a specimens. All requirements of ASTM F519 for specimens, preparation, testing, and reporting shall apply. Type 1a.2 specimens shall meet the requirements of D6-4307.

Specimens: Type 1c, cadmium plated per MIL-STD-870.
(45% load, 150 hours, notched immersed for the duration, room temp.)

Concentrate:	***#1:***	***No failure occurred within 150 hours.***
	#2:	***No failure occurred within 150 hours.***
	#3:	***No failure occurred within 150 hours.***
	#4:	***No failure occurred within 150 hours.***
Dilute:	***#1:***	***No failure occurred within 150 hours.***
	#2:	***No failure occurred within 150 hours.***
	#3:	***No failure occurred within 150 hours.***
	#4:	***No failure occurred within 150 hours.***

Result Conforms

Cypher Environmental Ltd.
ATTN: Teaghan Wellman
1149 St. Matthews Avenue
2nd Floor
Winnipeg Manitoba R3G 0J8

Date Received: 03-FEB-17
Report Date: 10-FEB-17 13:06 (MT)
Version: FINAL

Client Phone: 204-489-1214

Certificate of Analysis

Lab Work Order #: L1886901

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Judy Dalmaijer
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1886901-1 40L OF 0.25% DUST STOP Sampled By: CLIENT on 03-FEB-17 Matrix: LIQUID							
Miscellaneous Parameters							
Trout Bioassay LC50	See attached.					03-FEB-17	R3649799

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
TROUT-LC50-WP	Water	Trout Bioassay LC50	EPS 1/RM/13, EPS 1/RM/9

Certified, disease-free rainbow trout (Oncorhynchus mykiss) are exposed to several concentrations of a sample including full strength, under static conditions in order to estimate the median lethal concentration (LC50) - the concentration of the sample in water that is estimated to be lethal to 50% of the test organisms within a 96-hour exposure period.

Samples with excessive salinity (reported as conductivity greater than 13700 µmhos/cm) discharging into marine waters will require alternate testing.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Rainbow Trout Bioassay Test Report - LC50

Sample ID:	L1886901-1

Summary Results

96-hour LC50 v/v (%):	Non-Lethal
95% Lower Confidence Interval (%):	n/a
95% Upper Confidence Interval (%):	n/a
Method of Calculation:	n/a
Confirmed by Graph:	n/a

Sample Information

Sample Origin:	Cypher Environmental
Sample Description:	40L of 0.25% Dust Stop
Sampling Date and Time:	03-Feb-17
Sampling Method:	Grab
Sampled By:	Not Provided
Container(s) Description:	2 x 20L polyethylene pails without liners
Sample Volume:	40L
Date and Time Received:	03-Feb-17 14:40
Transit Irregularities:	None
Storage Temperature (˚C):	n/a

Test Information

Test Organism:	Oncorhynchus mykiss
Test Description:	Acute, 96-hour, Static, LC50
Reference Method(s):	EPS 1/RM/13, 2nd Ed. Dec. 2000, with 2007 and 2016 amendments, Environment Canada EPS 1/RM/9, May 1996 with May 2007 amendments, Environment Canada
Performed By:	AGJ
Starting Date and Time:	03-Feb-17 16:45
Deviations from Reference Method:	None

Initial Parameters

Observations

Colour:	Dark Brown					
Odour:	Mild					
Turbidity:	High					
Solids:	High					
Hardness (mg/L):	2.5	mL Titration Solution/	10	mL of Sample x 1000 =	250	
Alkalinity (mg/L):	1.4	mL Titration Solution/	10	mL of Sample x 1000 =	140	
Temperature (°C):	14.4	Thermometer		S/N 91154465		
Dissolved Oxygen (mg/L):	6.15	YSI Dissolved Oxygen Meter		S/N 15M102668		
Conductivity (µS/cm):	696	VWR Portable Conductivity Meter		S/N 51071543		
pH (5.5-8.5 pH units):	8.86	VWR SympHony pH Meter		S/N D01908		
pH Adjustment:	Not Adjusted					
pH Adjustment Procedure:	n/a					

Pre-Aeration

Aeration Time (min):	30					
Sample Test Concentration (v/v):	0.250%	0.125%	0.063%	0.031%	0.016%	0%
Aeration Rate (5.5-7.5 mL/min/L):	6.1 ± 0.2	6.1 ± 0.2	6.1 ± 0.2	6.1 ± 0.2	6.1 ± 0.2	6.1 ± 0.2
xygen (D.O.) Before Pre-Aeration (%):	75.7	n/a	n/a	n/a	n/a	93.4
Average D.O. After Pre-Aeration (%):	83.2	n/a	n/a	n/a	n/a	96.3

Test Organism Data

Lot Number:	11/01/17 T3
Weekly Mortality Preceeding Test (%):	0
Sample Size:	10

Conditions Common to All Concentrations During Test

Source of Holding/Dilution Water:	Dechlorinated UV Treated City of Winnipeg Tap Water
Container Description:	20 L Polyethylene Pail with Liner
Aeration Method:	Compressed air bubbled through silica-glass air diffuser
Aeration Rate (5.5-7.5 mL/min/L):	(as set during pre-aeration above)
Test Solution Volume (L):	20
Test Solution Depth (cm):	34
Number of Test Organisms per Container:	10
Loading Density (g/L):	0.23

Conditions During Test

Concentration (% v/v)	Temperature (˚C) (15 ± 1˚C)					Dissolved Oxygen (mg/L)					pH (pH units)				
	0h	24h	48h	72h	96h	0h	24h	48h	72h	96h	0h	24h	48h	72h	96h
0	14	n/a	n/a	n/a	14	9.81	n/a	n/a	n/a	9.72	7.51	n/a	n/a	n/a	7.68
0.016	14	n/a	n/a	n/a	14	9.93	n/a	n/a	n/a	9.66	7.58	n/a	n/a	n/a	7.38
0.031	14	n/a	n/a	n/a	14	9.79	n/a	n/a	n/a	9.59	7.61	n/a	n/a	n/a	7.42
0.063	14	n/a	n/a	n/a	14	9.43	n/a	n/a	n/a	9.57	7.84	n/a	n/a	n/a	7.52
0.125	14	n/a	n/a	n/a	14	8.52	n/a	n/a	n/a	9.37	8.18	n/a	n/a	n/a	7.52
0.25	14	n/a	n/a	n/a	14	6.78	n/a	n/a	n/a	7.21	8.86	n/a	n/a	n/a	7.36

Conc. (% v/v)	Conductivity (µS/cm)	Number of Fish Dead				Number of Fish Stressed			
	0h	24h	48h	72h	96h	24h	48h	72h	96h
0	332	n/a	n/a	n/a	0	n/a	n/a	n/a	0
0.016	355	n/a	n/a	n/a	0	n/a	n/a	n/a	0
0.031	394	n/a	n/a	n/a	0	n/a	n/a	n/a	0
0.063	452	n/a	n/a	n/a	0	n/a	n/a	n/a	0
0.125	546	n/a	n/a	n/a	0	n/a	n/a	n/a	0
0.25	700	n/a	n/a	n/a	0	n/a	n/a	n/a	0

Control Fish Information at End of Test

Mean Fork Length (mm):	38
Lower Range Fork Length (mm):	36
Upper Range Fork Length (mm):	40
Mean Wet Weight (g):	0.47

Mortality and Stressed Behaviour Information

Conc. (% v/v)	Mean Number of Fish at End of Test		Mean Rate of Fish at End of Test (%)	
	Dead	**Stressed**	**Dead**	**Stressed**
0	0	0	0	0
0.016	0	0	0	0
0.031	0	0	0	0
0.063	0	0	0	0
0.125	0	0	0	0
0.25	0	0	0	0

Median Lethal Concentration Results for Multi-Concentration Tests

LC50:	Non-Lethal
LC50 Lower 95% Confidence Limit:	n/a
LC50 Upper 95% Confidence Limit:	n/a
Statistical Method:	n/a

Note: Non-lethal = 0 mortality

Reference Toxicant Test Results

Reference Toxicant:	Zinc Sulfate
Date Reference Toxicant Initiated:	26-Jan-17
Recent 96h Reference Toxicant Test LC50 (mg/L Zinc):	0.33
Lower 95% Confidence Limit (mg/L Zinc):	0.23
Upper 95% Confidence Limit (mg/L Zinc):	0.46
Historic Geometric Mean LC50 (mg/L Zinc):	0.64
Lower 95% Confidence Limit (mg/L Zinc):	0.27
Upper 95% Confidence Limit (mg/L Zinc):	1.51
Method of Calculation:	Stephan LC50 Program, Probit
Confirmed by Graph:	Yes

Sublethal Biological Effects

No sublethal biological effects observed.

Observations/Comments

No toxicity observed.

10- 231632

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

L1886901

Page ____ of ____

Report To	**Report Format / Distribution**	**Service Request:** (Rush subject to availability - Contact ALS to confirm TAT)
Company: Cypher Environmental	Standard: X Other (specify):	Regu
Contact: Teaghan Wellman	Select: PDF X Excel Digital Fax	Priorit
Address: 1149 St. Matthews Ave	Email 1: teaghan@cypherenvironmental.com	Emer
	Email 2:	Same
Phone: 204-489-1214 Fax:		
Invoice To Same as Report ? (circle) Yes or (No) (if No, provide details)	**Client / Project Information**	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) (Yes) or No	Job #:	
Company: Cypher Environmental	PO / AFE:	
Contact: Maureen Sutherland	LSD:	
Address: 1149 St. Matthews Ave		
Phone: 204-489-1214 Fax:	Quote #:	
Lab Work Order # (lab use only)	**ALS Contact:**	**Sampler:**

L1886901-COFC

Contact Lee Ann for Test.

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	40L of 0.25% Dust Stop.	2/3/17		liquid	2.

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				Feb 3/17	2:40p	29 °C				

THE RURAL MUNICIPALITY OF MACDONALD

October 7, 2016

To Whom It May Concern:

We have recently applied Cypher Environmental's new Dust Stop Municipal Blend (DSMB) product to on La Verendrye Road within the municipality. The site runs off the Perimeter Highway west, between Wilkes Avenue and McGillivray Blvd. and is a very heavily trafficked road. DSMB was advertised to be competitive with chlorides in terms of cost and effectiveness and so far has performed well and exhibited excellent properties during and after rain. The product has stood up to the elements very well thus far, with several periods of rain and hot, dry and windy weather.

We were also pleased with the great customer support, including both remotely and on-site assistance during the application of the product. We continue to see more than satisfactory results and are happy with the dust and erosion control provided.

We look forward to future projects involving Cypher Environmental.

Sincerely,

Grant Baker
Public Works Manager
Rural Municipality of MacDonald
161 Mandan Drive
Sanford, Manitoba, Canada
R0G 2J0
Phone: 204-736-2214
Email: gbaker@rmofmacdonald.com
www.rmofmacdonald.com

August 22, 2017

To Whom It May Concern:

We have recently applied Cypher Environmental's new Dust Stop Municipal Blend (DSMB) product to on Victor Avenue within the municipality. DSMB was advertised to be competitive with chlorides in terms of cost and effectiveness and so far has performed well and exhibited excellent properties during and after rain. The product has stood up to the elements very well thus far, with periods of rain and hot, dry and windy weather.

We were also pleased with the great customer support, including both remotely and on-site assistance during the application of the product. We continue to see more than satisfactory results and are happy with the dust and erosion control provided.

We look forward to future projects involving Cypher Environmental.

Sincerely,

Rick Gamble
Mayor
Village of Dunnottar
PO Box 321
Matlock, Manitoba, Canada
R0C 2B0
Phone: 204-389-4962
Email: info@dunnottar.ca
www.dunnottar.ca

AGNICO EAGLE

OPERATIONS, MAINTENANCE AND SURVEILLANCE MANUAL: HOPE BAY DORIS TAILINGS IMPOUNDMENT AREA

HOPE BAY, NUNAVUT

Appendix D - Figures

Original figure produced by SRK consulting (May 2016), updated by Agnico (March 2023).

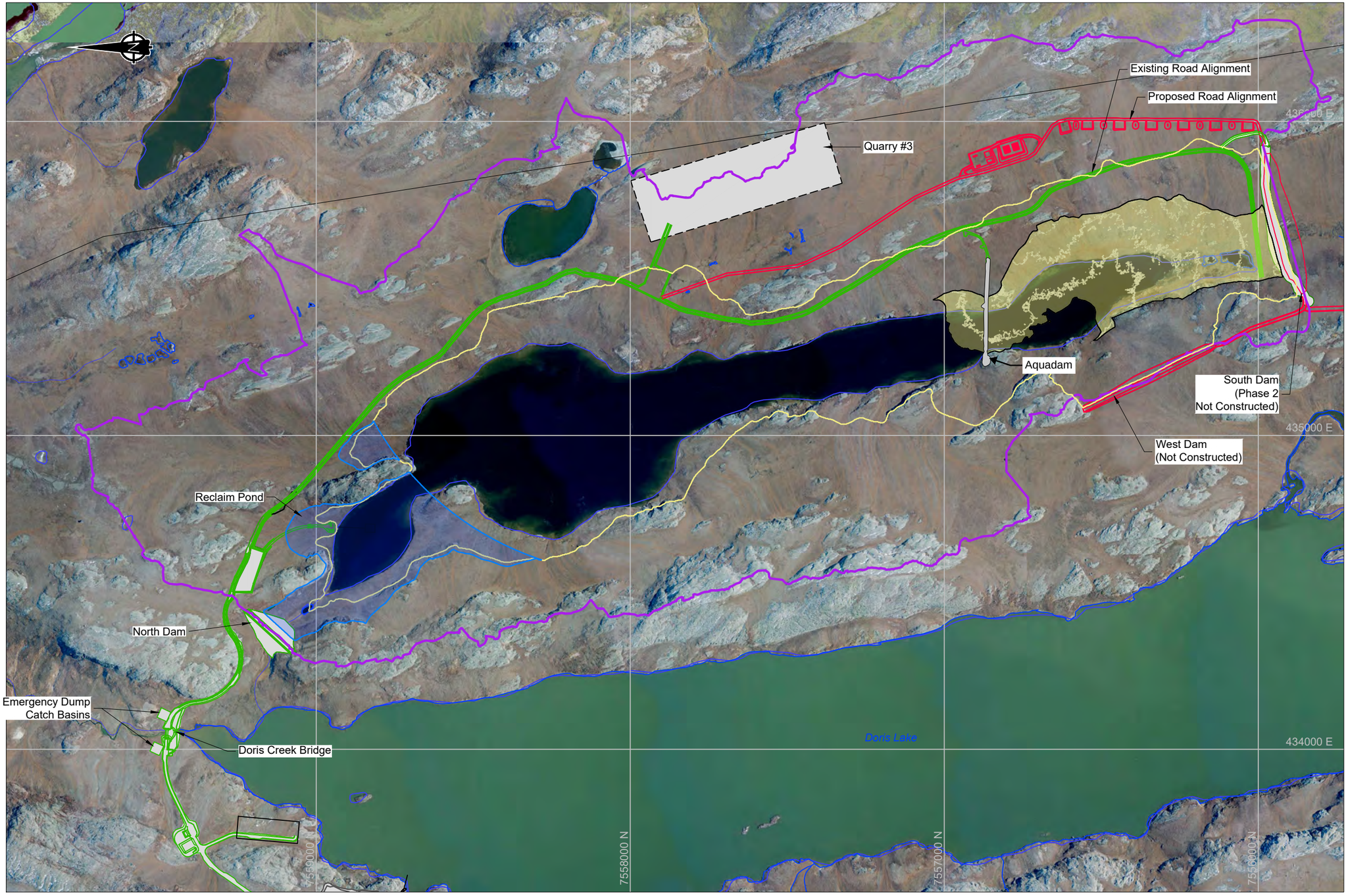
AGNICO EAGLE

HOPE BAY PROJECT

DORIS TIA OMS MANUAL

Site Location Plan

DATE:	APPROVED:	FIGURE:
March 2023	BJ	1



LEGEND

- Existing Infrastructure
- Proposed Road Realignment
- Ultimate Tailings Extent
- Dam / Dike
- Ultimate Reclaim Pond Extent
- Watershed Boundary
- Quarry (not developed)
- Subaerial Tailings Beach 2021

REFERENCE

NAD83 UTM Zone 13.
Aerial image captured in 2007, provided by client.
2021 Tailings Beach survey collected by drone LiDAR in August 2021, data provided by client.

0m 20 40 60 80
0m 100 200 300 400 500

Original figure produced by SRK consulting (June 2020), updated by Agnico (March 2023).

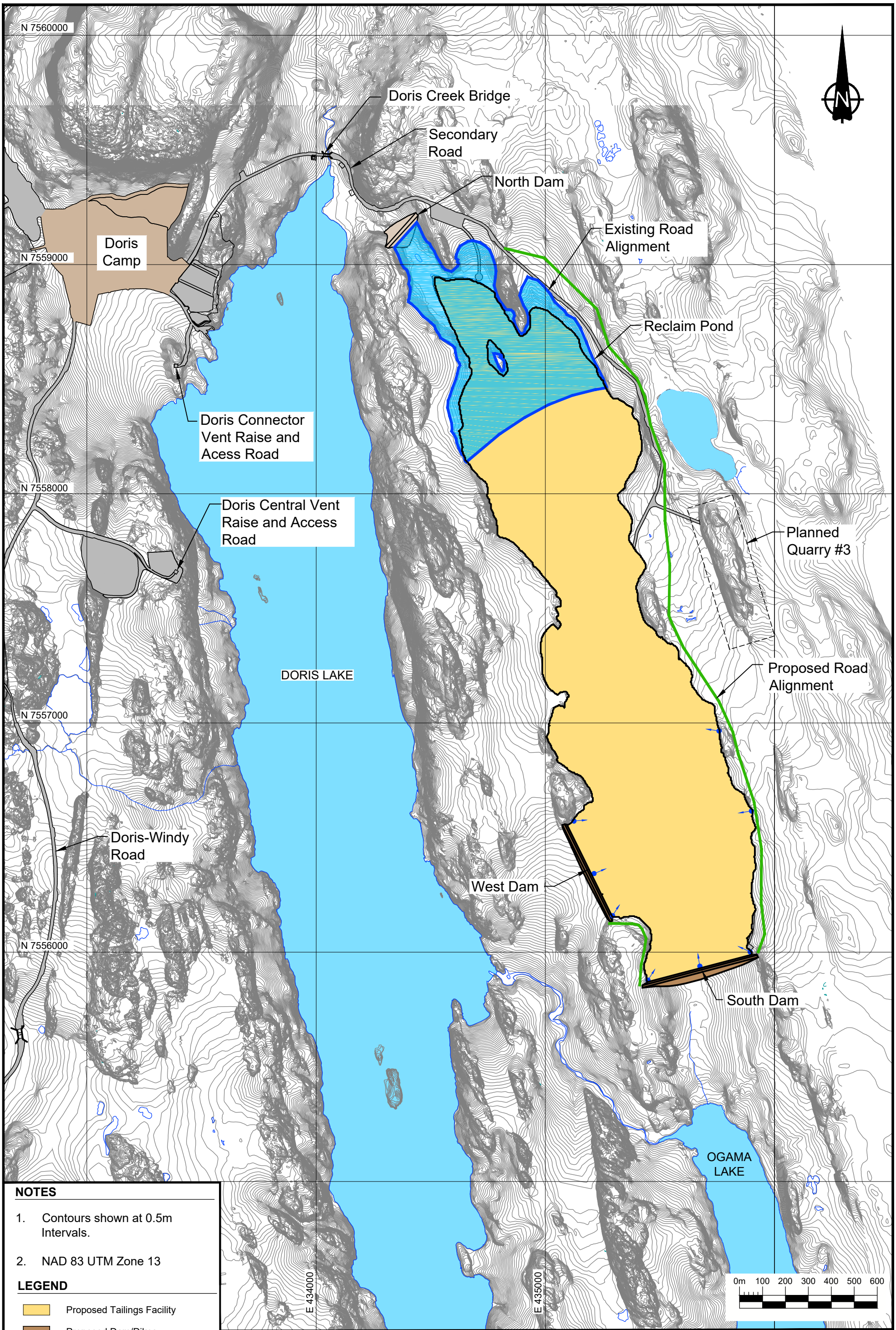
AGNICO EAGLE

Doris TIA

DORIS TIA OMS MANUAL

Site General Arrangement

DATE:	APPROVED:	FIGURE:
March 2023	BJ	2



NOTES

1. Contours shown at 0.5m Intervals.
2. NAD 83 UTM Zone 13

LEGEND

- Proposed Tailings Facility
- Proposed Dam/Dikes
- Existing Facilities
- Existing Doris Camp
- Proposed Road Realignment

AGNICO EAGLE

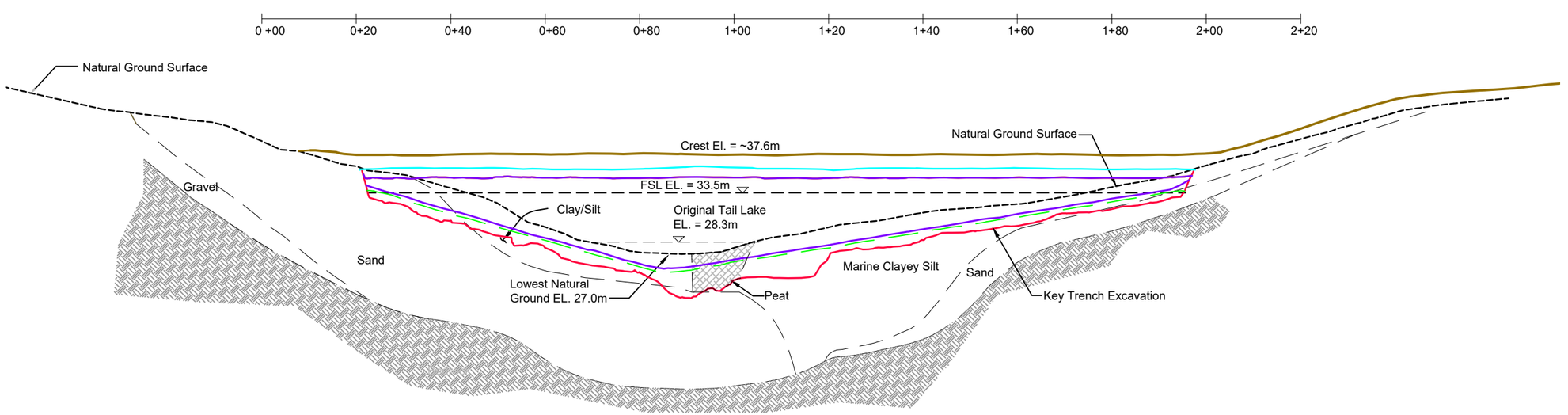
HOPE BAY PROJECT

DORIS TIA OMS MANUAL

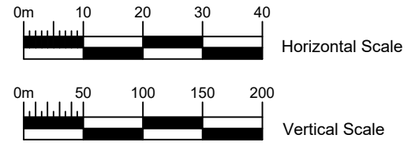
TIA Site Overview (End Phase 2)

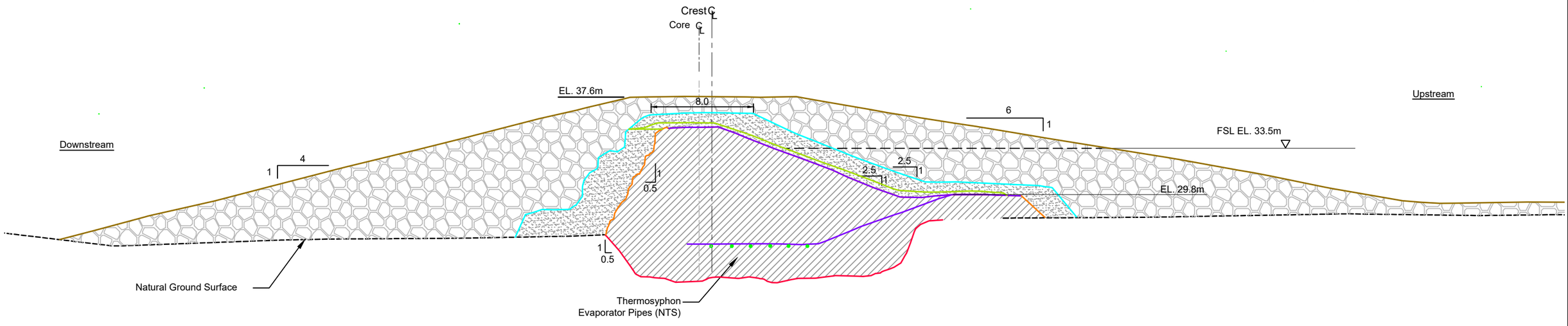
DATE:	APPROVED:	FIGURE:
March 2023	BJ	3

Original figure produced by SRK consulting (May 2018), updated by Agnico (March 2023).

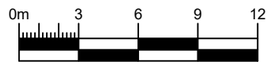


SECTION ALONG NORTH DAM CREST CENTERLINE





NORTH DAM TYPICAL SECTION



LEGEND

- Natural Ground
- Stratigraphic Boundary
- Core Material
- Transition Material
- Run of Quarry (ROQ)
- Surfacing Material
- Bedrock
- Peat
- Thermosyphon Evaporator Pipe (NTS)
- Geosynthetic Clay Liner (GCL)
- Core Material
- Key Trench
- GCL Cover Material
- Transition Material
- ROQ Material
- Thermosyphon Evaporator Pipes
- Thermosyphon Evaporator Pipes

NOTES

1. The subsurface geology has been extrapolated from a series of geotechnical investigations consisting of drill holes, auger holes and shallow test pits. Bedrock contact and geological unit contacts are therefore likely to vary somewhat.

REFERENCES

Diagram Source: 2021 Annual Geotechnical Inspections (SRK 2022)

Original figure produced by SRK consulting (March 2020), updated by Agnico (March 2023).

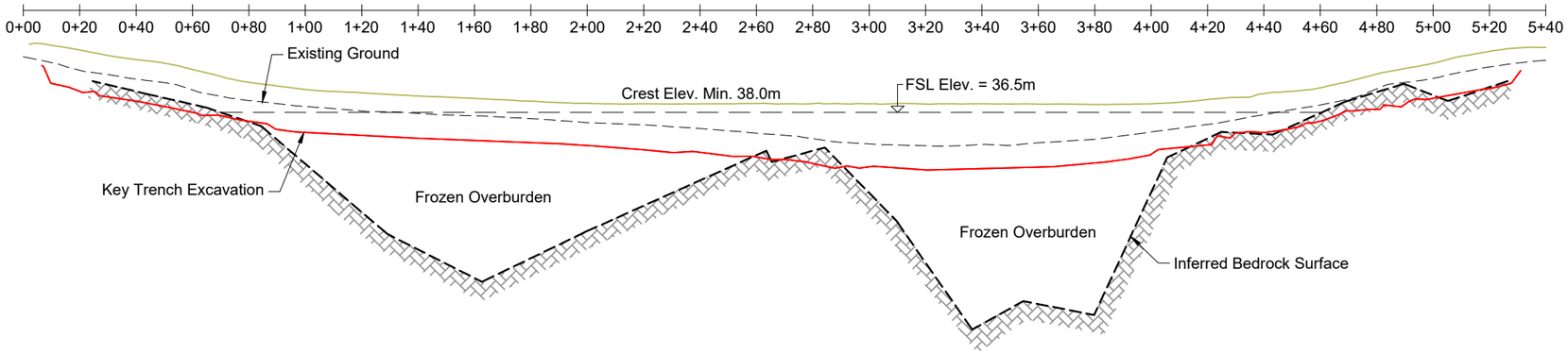
AGNICO EAGLE

Doris TIA

DORIS TIA OMS MANUAL

North Dam Foundation Conditions and Typical As-Built Section

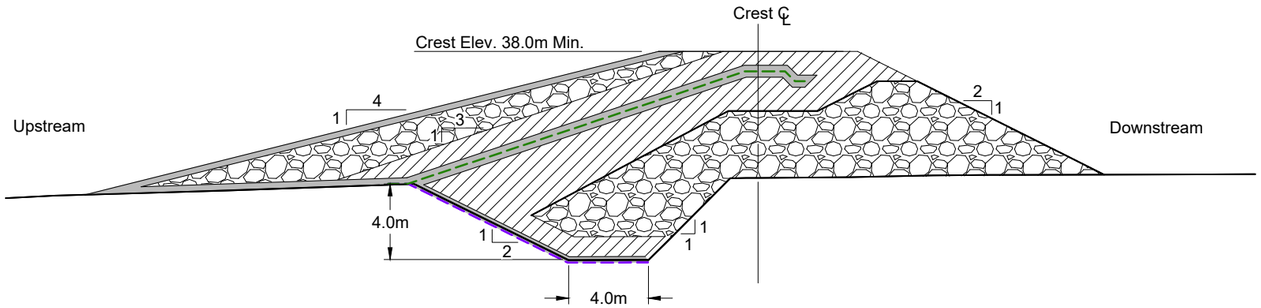
DATE:	APPROVED:	FIGURE:
March 2023	BJ	4



SECTION ALONG
SOUTH DAM CREST CENTERLINE

0m 20 40 60 80 Horizontal

0m 10 20 30 40 Vertical



SOUTH DAM TYPICAL SECTION

0m 3 6 9 12

LEGEND

- Thermistor Bead Location
- Lower GCL Liner
- Upper GCL Liner
- Bedding Material
- Transition Material
- Run of Quarry Backfill

NOTES

1. Topographic and as-built contour data from the terrain model was provided by the Client.
2. All units shown are in meters unless otherwise stated.

REFERENCES

Diagram Source: 2021 Annual Geotechnical Inspections (SRK 2022)

Original figure produced by SRK consulting (March 2020), updated by Agnico (March 2023).

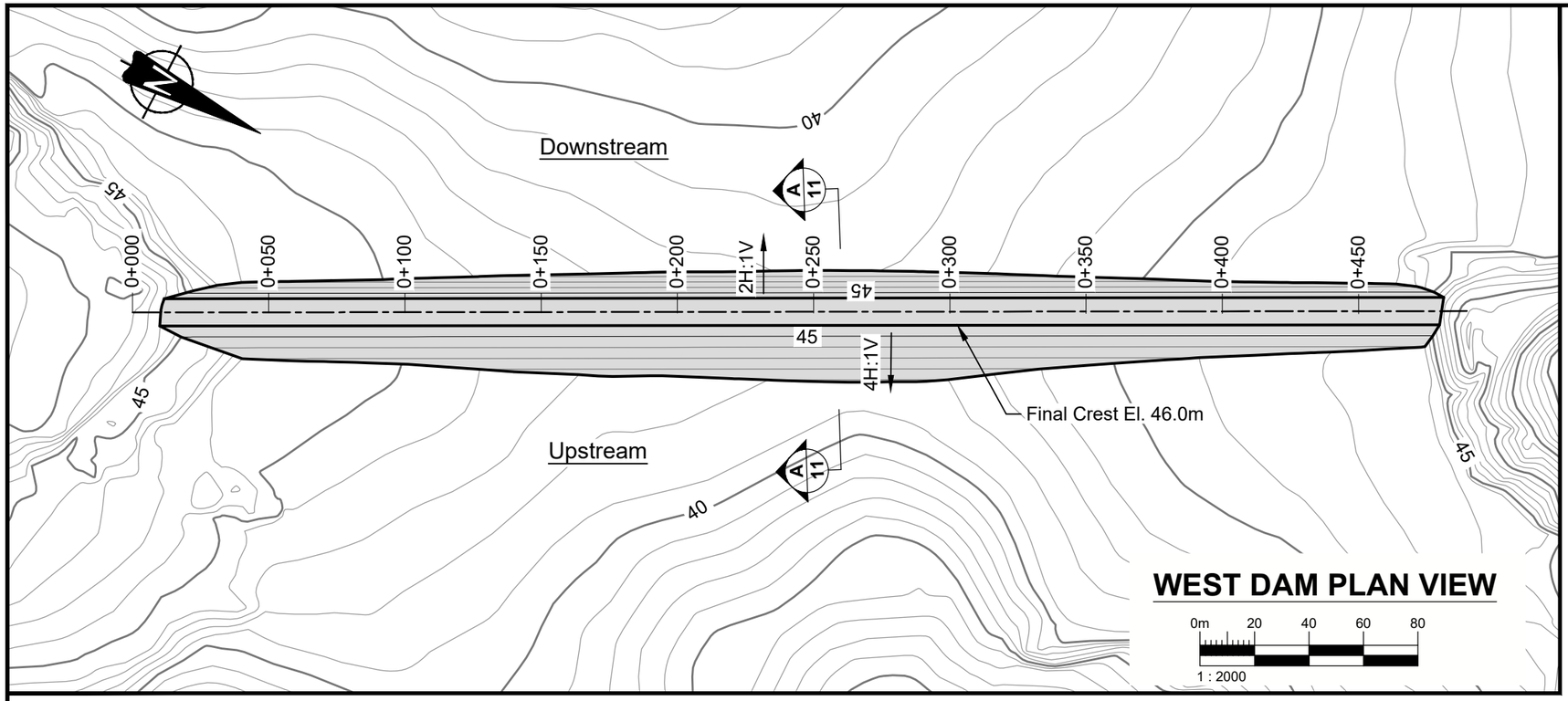
AGNICO EAGLE

Doris TIA

DORIS TIA OMS MANUAL

South Dam Foundation Conditions and Typical As-Built Section

DATE:	APPROVED:	FIGURE:
March 2023	BJ	5



WEST DAM PLAN VIEW

0m 20 40 60 80

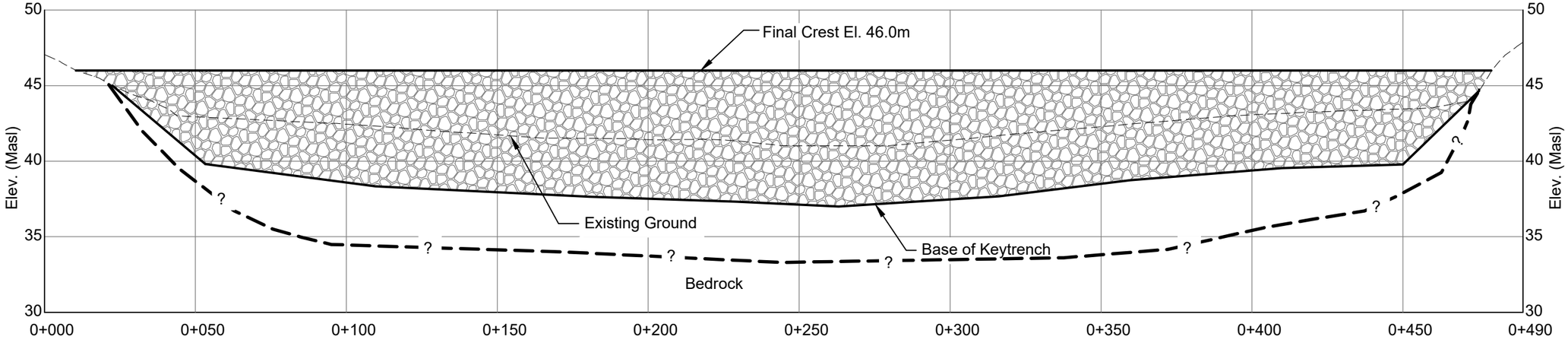
1 : 2000

LEGEND

- Natural Ground
- Approximate Stratigraphic Boundary
- Run of Quarry (ROQ)

NOTES

1. All dimensions and elevations are in meters unless stated otherwise.
2. The subsurface geology has been extrapolated from a series of geotechnical investigations. Bedrock contact and geological unit contacts are therefore likely to vary somewhat during final excavation.



WEST DAM PROFILE

5x EXAGGERATION

0m 10 20 30 40 50 60

Horizontal Scale

Original figure produced by SRK consulting (May 2016), updated by Agnico (March 2023).

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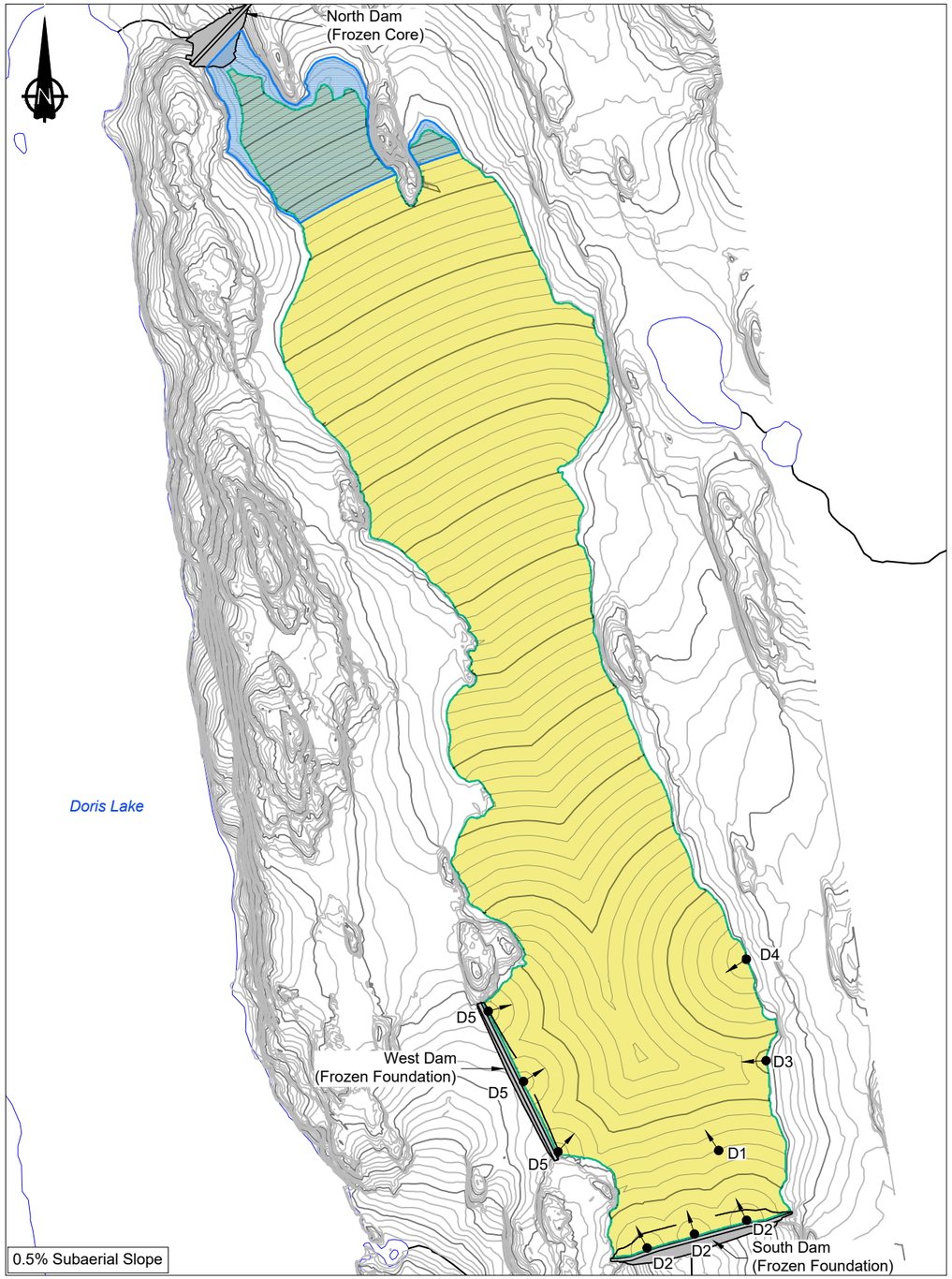
HOPE BAY PROJECT

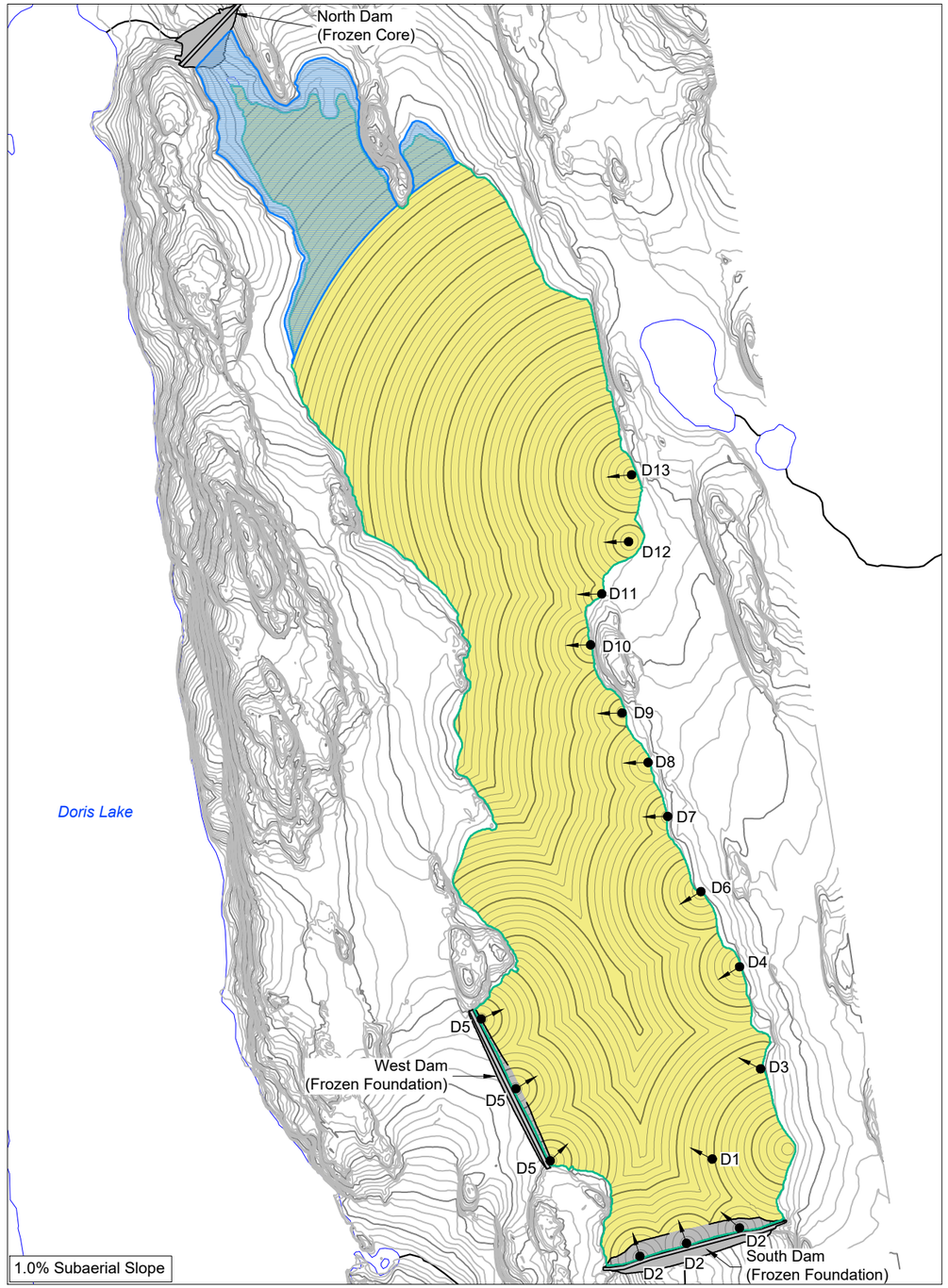
DORIS TIA OMS MANUAL

West Dam

Plan and Profile

DATE:	APPROVED:	FIGURE:
March 2023	BJ	6





LEGEND

- Spigot Location
- Deposited Tailings

NOTES

1. Deposition durations are approximate and were based on the Mine Plan average production rates provided by TMAC Resources.
2. A deposited tailings dry density of 1.3t/m³ was used.
3. All tailings volumes presented include ice entrainment at 20% of production.
4. Dam elevations shown were assumed constant throughout deposition.
5. Total storage requirements includes Madrid and Boston Tailings (Tailings 11.6Mm³ + Ice Entrainment 2.3Mm³).

REFERENCE

NAD83 UTM Zone 13.

0m 3 6 9 12

Note:
Final tailings beach slope will be based on operation. Tailings beach will be somewhere between 0.5% and 1% slope; based on latest as-built survey and operations data (as of December 2019).

Original figure produced by SRK consulting (April 2020), updated by Agnico (March 2023).

AGNICO EAGLE

Doris TIA

DORIS TIA OMS MANUAL

Planned Tailings Deposition
(Phase 1 & Phase 2) - End of Mine

DATE:	APPROVED:	FIGURE:
March 2023	BJ	7

LEGEND

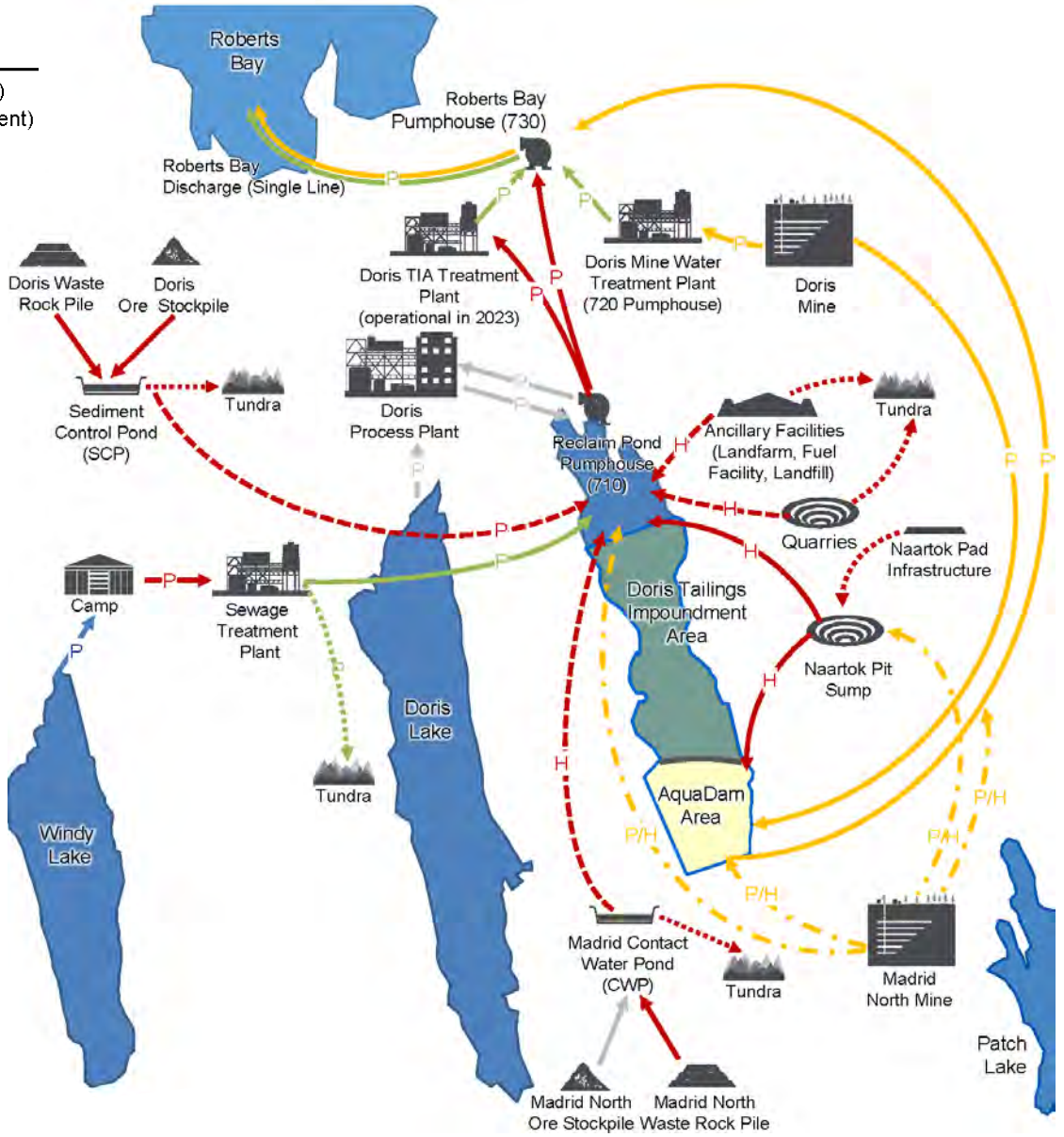
Flow Types	Other Lines & Symbols
Freshwater	For Discharge (WQ-dependent)
Future Phase Flow	For Management (WQ-dependent)
Treated Water	Contingency Options
Mine Water	P Pumped Flow
Contact Water	H Hauled Flow

Notes:

- Arrows without labels are gravity-driven flows.
- Conceptual diagram; illustrative layout only; not to scale.
- Dotted Lines indicate water management options for Naartok Portal Project and Madrid North Area.
- Direct precipitation, natural runoff, and evaporation not explicitly indicated but accounted for in site water balance.

REFERENCES

Diagram Source: 1.4 - 2022 IRB Water Management Presentation



Original figure produced by SRK consulting (March 2020), updated by Agnico (March 2023).

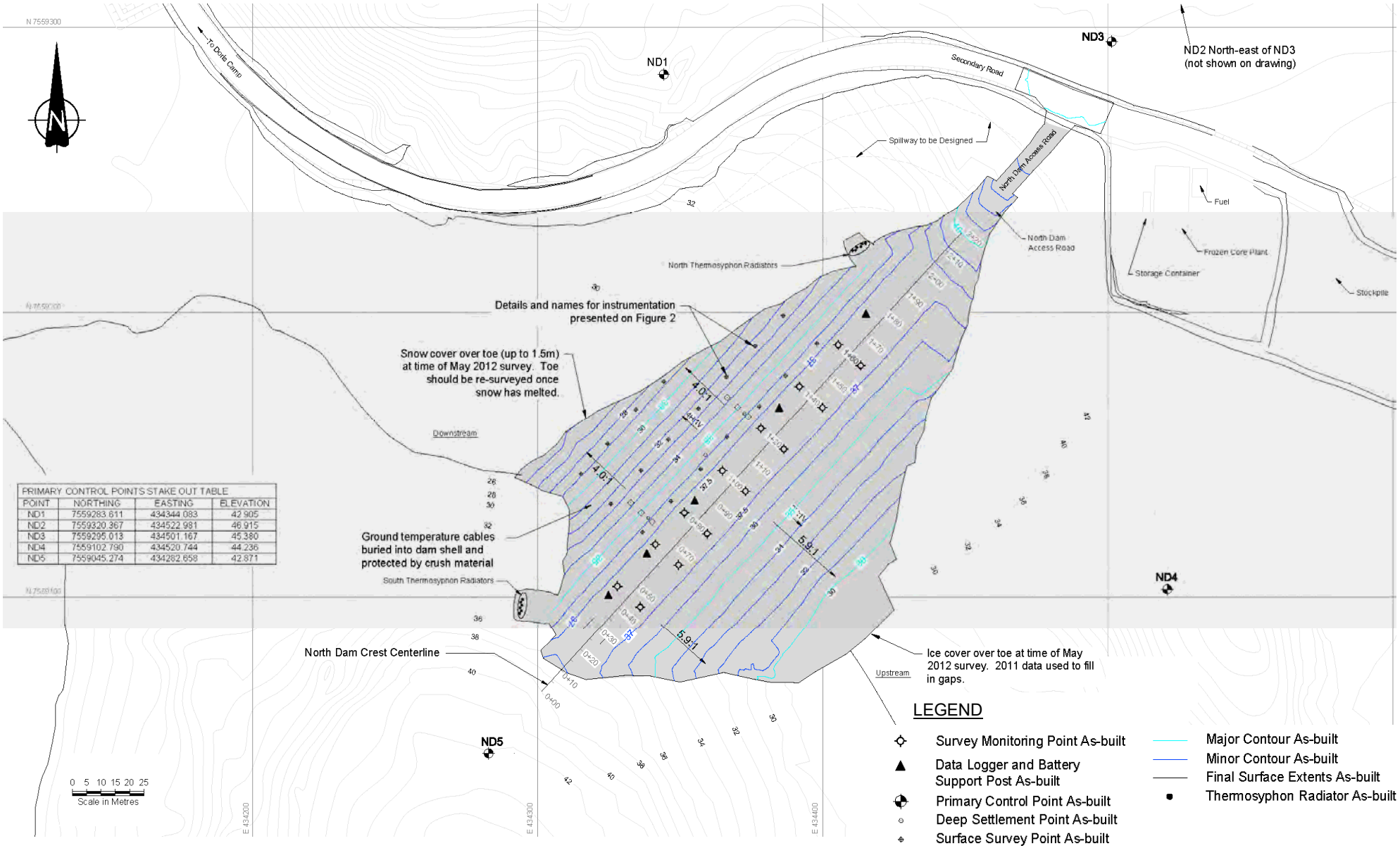
AGNICO EAGLE

Doris TIA

DORIS TIA OMS MANUAL

Schematic of TIA Water Management

Date:	Approved:	Figure:
March 2023	BJ	8



PRIMARY CONTROL POINTS STAKE OUT TABLE			
POINT	NORTHING	EASTING	ELEVATION
ND1	7559283.611	434344.083	42.905
ND2	7559320.367	434522.981	46.915
ND3	7559295.013	434501.167	45.380
ND4	7559102.790	434520.744	44.236
ND5	7559045.274	434282.658	42.871

LEGEND

- Survey Monitoring Point As-built
- Data Logger and Battery Support Post As-built
- Primary Control Point As-built
- Deep Settlement Point As-built
- Surface Survey Point As-built
- Inclinometer Location As-built
- Major Contour As-built
- Minor Contour As-built
- Final Surface Extents As-built
- Thermosyphon Radiator As-built

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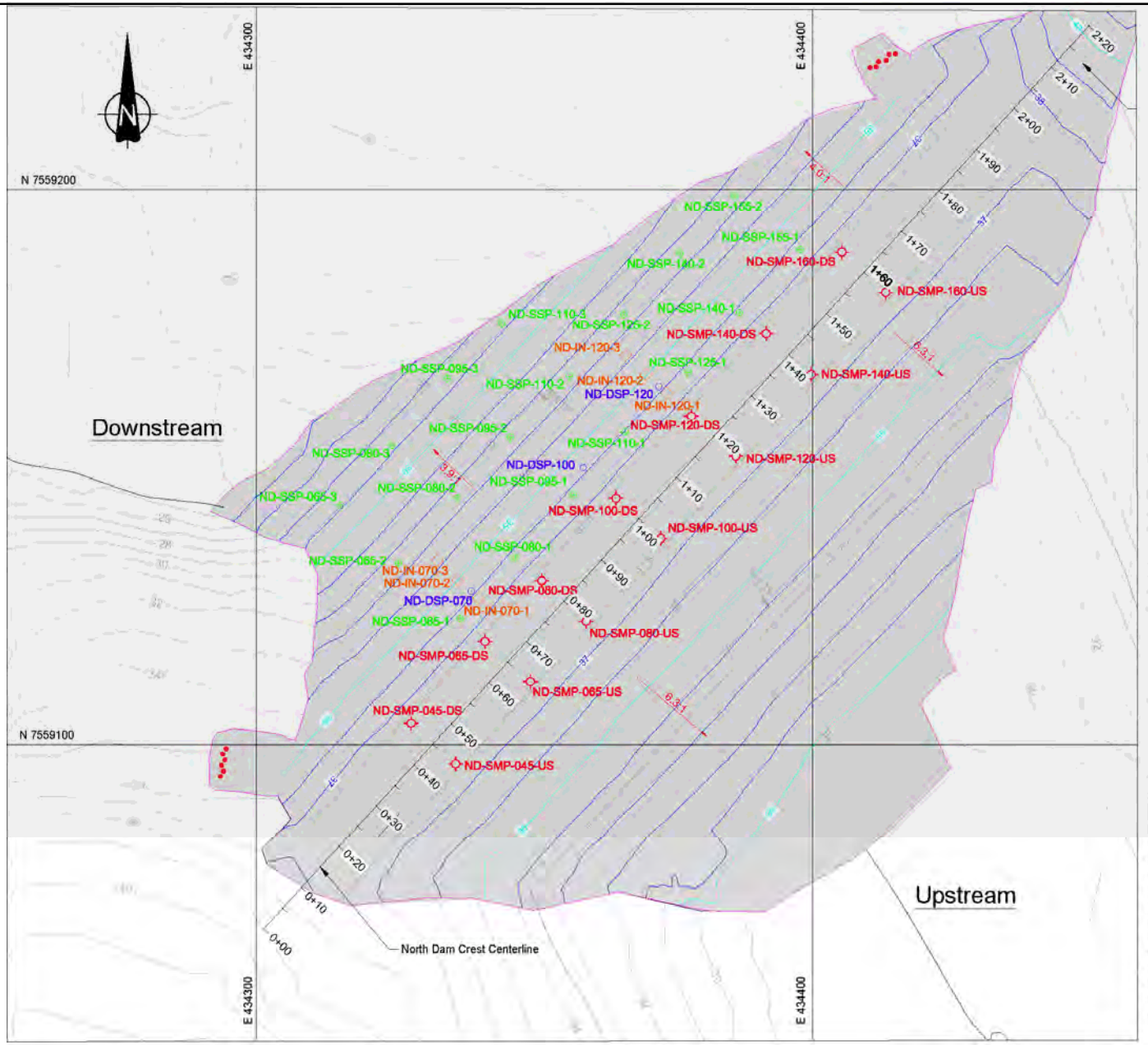
HOPE BAY PROJECT

DORIS TIA OMS MANUAL

North Dam General Arrangement and Primary Control Points

Date:	Approved:	Figure:
March 2023	BJ	9

Original figure produced by SRK consulting (May 2016), updated by Agnico (March 2023).



LEGEND

- Survey Monitoring Point As-built
- Deep Settlement Point As-built
- Surface Survey Point As-built
- Inclinometer Location As-built
- Major Contour As-built
- Minor Contour As-built
- Final Surface Extents As-built
- Thermosyphon Radiator As-built

AS-BUILT DEEP SETTLEMENT POINTS STAKEOUT TABLE

ID	Northing	Easting	Elev. (m)
ND-DSP-070	7559127.69	434338.65	36.95
ND-DSP-100	7559149.78	434358.75	36.86
ND-DSP-120	7559164.46	434372.37	36.92

AS-BUILT INCLINOMETER LOCATION STAKEOUT TABLE

ID	Northing	Easting	Elev. (m)
ND-IN-070-1	7559126.41	434340.00	37.44
ND-IN-070-2	7559129.63	434336.27	36.20
ND-IN-070-3	7559133.13	434332.57	34.85
ND-IN-120-1	7559163.31	434373.78	37.44
ND-IN-120-2	7559166.64	434370.03	36.05
ND-IN-120-3	7559170.15	434366.40	34.95

AS-BUILT SURFICIAL SURVEY POINTS STAKEOUT TABLE

ID	Northing	Easting	Elev. (m)
ND-SSP-065-1	7559122.80	434336.67	36.77
ND-SSP-065-2	7559132.67	434325.55	32.81
ND-SSP-065-3	7559143.10	434315.11	29.43
ND-SSP-080-1	7559133.65	434346.59	36.79
ND-SSP-080-2	7559144.37	434336.10	32.92
ND-SSP-080-3	7559153.75	434324.36	29.33
ND-SSP-095-1	7559144.90	434357.04	36.58
ND-SSP-095-2	7559155.21	434345.72	32.85
ND-SSP-095-3	7559165.92	434334.35	28.70
ND-SSP-110-1	7559156.20	434366.29	36.32
ND-SSP-110-2	7559166.31	434356.29	32.88
ND-SSP-110-3	7559175.79	434344.10	28.97
ND-SSP-125-1	7559166.97	434377.61	36.77
ND-SSP-125-2	7559177.37	434366.08	32.91
ND-SSP-140-1	7559177.75	434386.85	36.48
ND-SSP-140-2	7559188.28	434376.19	32.84
ND-SSP-155-1	7559189.07	434397.79	36.80
ND-SSP-155-2	7559198.85	434385.98	32.91

AS-BUILT SURVEY MONITORING POINTS STAKEOUT TABLE

ID	Northing	Easting	Elev. (m)
ND-SMP-065-DS	7559118.52	434341.14	38.46
ND-SMP-065-US	7559111.31	434349.30	38.36
ND-SMP-080-DS	7559129.57	434351.35	38.41
ND-SMP-080-US	7559122.27	434359.34	38.40
ND-SMP-100-DS	7559144.32	434364.71	38.39
ND-SMP-100-US	7559137.12	434372.77	38.46
ND-SMP-120-DS	7559159.12	434378.24	38.41
ND-SMP-120-US	7559151.88	434386.24	38.46
ND-SMP-140-DS	7559173.98	434391.69	38.39
ND-SMP-140-US	7559166.62	434399.77	38.42
ND-SMP-160-DS	7559188.64	434405.30	38.40
ND-SMP-160-US	7559181.37	434413.18	38.43

AGNICO EAGLE

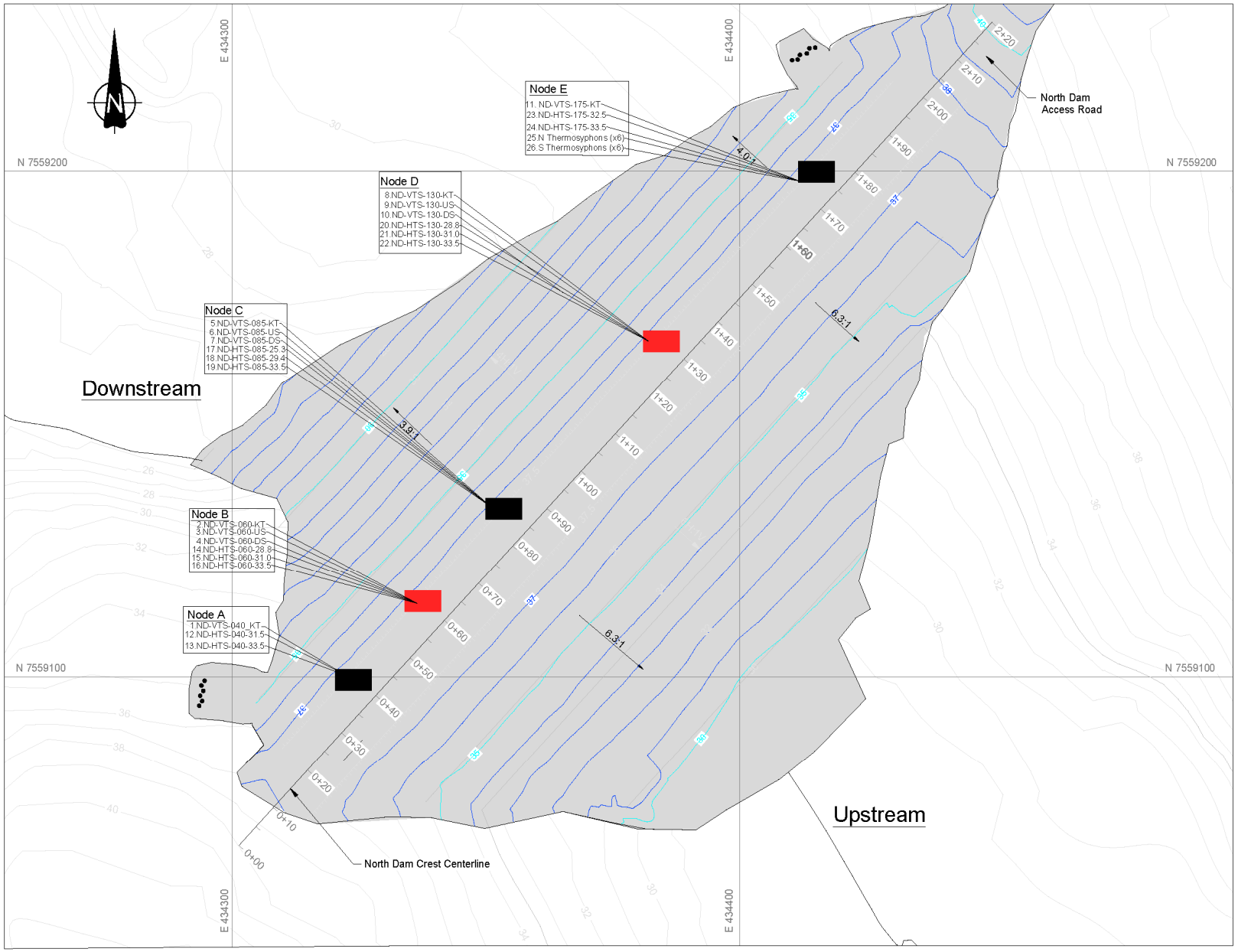
HOPE BAY PROJECT

DORIS TIA OMS MANUAL

North Dam Instrumentation Layout

Date:	Approved:	Figure:
March 2023	BJ	**10**

Original figure produced by SRK consulting (May 2016), updated by Agnico (March 2023).



LEGEND

- Major Contour As-built (5m)
- Major Contour As-built (1m)
- Final Surface Extents As-built
- Thermosyphon Radiator As-Built

Note: the two weatherproof enclosures which house the data loggers are shown in red.

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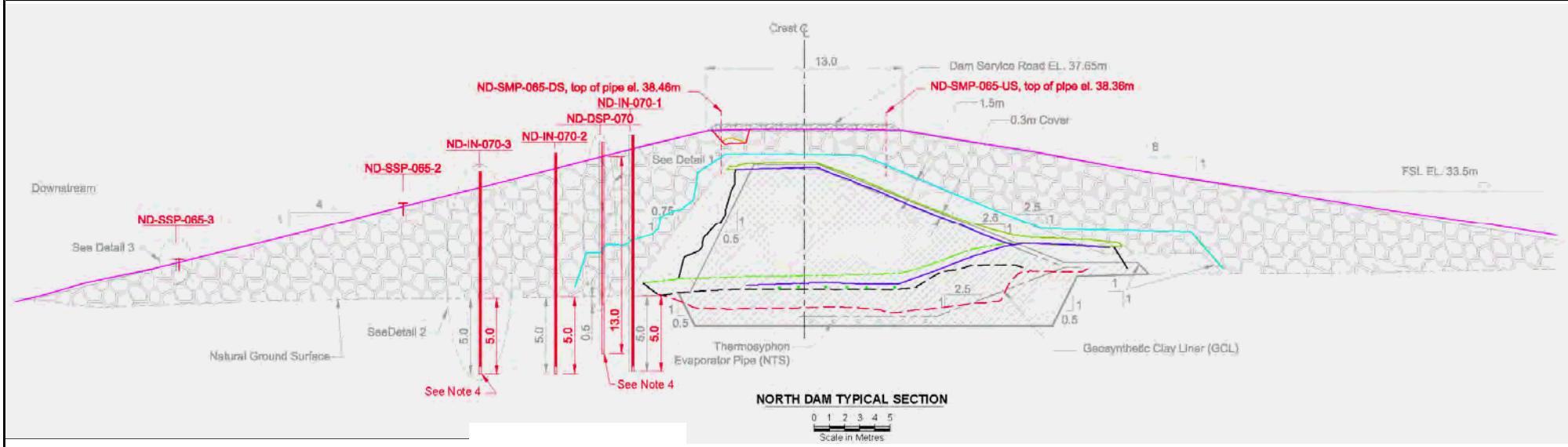
HOPE BAY PROJECT

DORIS TIA OMS MANUAL

North Dam Ground and Thermosyphon Temperature Cable Locations

Date:	Approved:	Figure:
March 2023	BJ	**11**

Original figure produced by SRK consulting (May 2016), updated by Agnico (March 2023).



- Core Material
- Transition Material
- Run of Quarry (ROQ)
- Surfacing Material
- Bedrock
- Peat

- GCL As-built
- Core Material As-built
- Core Material (2011) As-built
- Levelling Course (Core Material) As-built
- Instrumentation Trench Cover As-built
- Key Trench / Instrumentation Trench As-built
- GCL Cover Material As-built
- Transition Material As-built
- ROQ Material As-built
- Thermosyphon Evaporator Pipes As-built

Example of as-built instrumentation installed on the downstream of dam.

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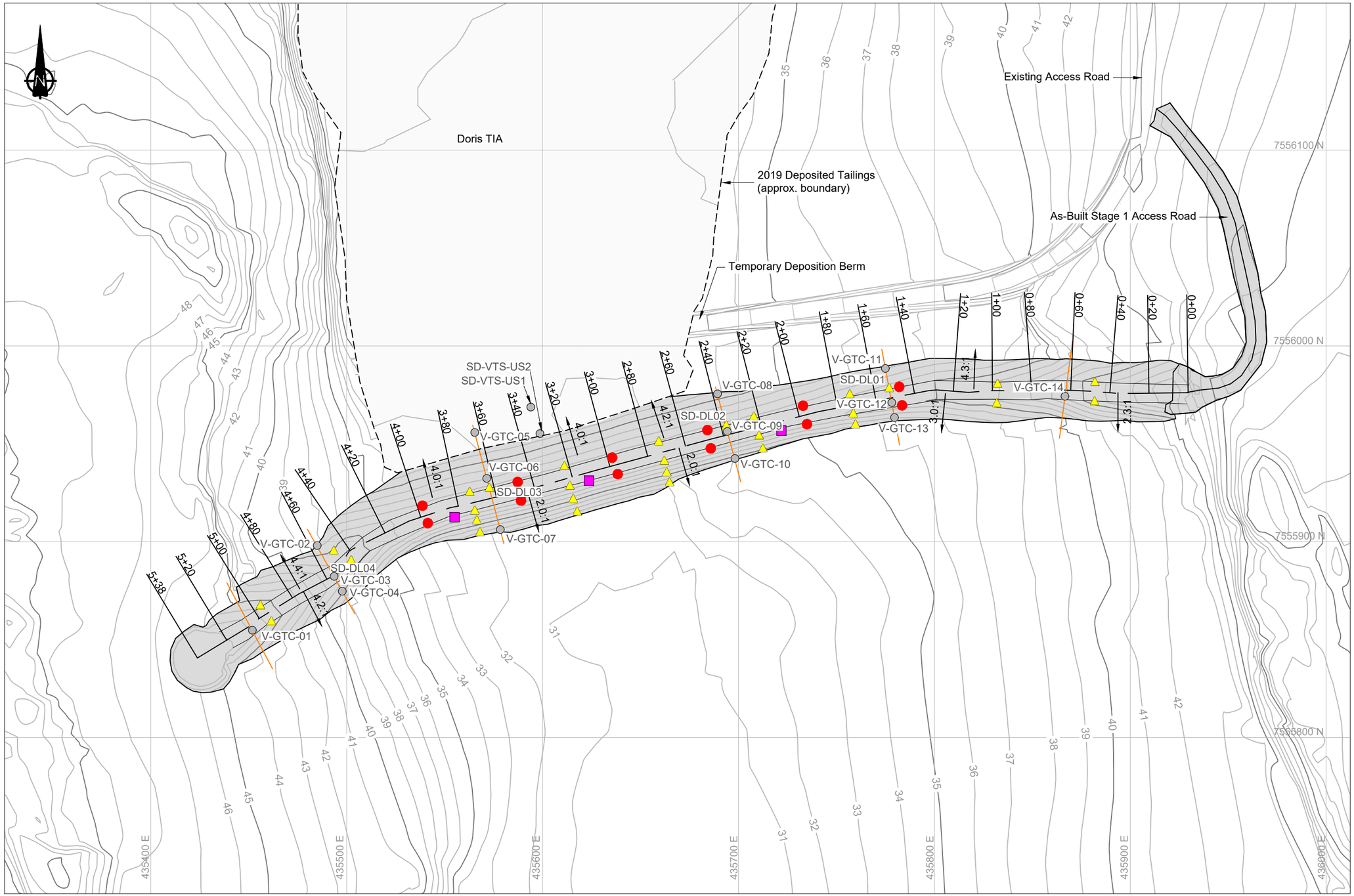
HOPE BAY PROJECT

DORIS TIA OMS MANUAL

North Dam Deformation Monitoring Instrumentation Layout

Date:	Approved:	Figure:
March 2023	BJ	**12**

Original figure produced by SRK consulting (May 2016), updated by Agnico (March 2023).



LEGEND

- As-Built Survey Monitoring Point
- Design Surface Monitoring Point
- Design Deep Settlement Point
- Datalogger Location
- Vertical Ground Temperature Cable

NOTES

1. Topographic and As-built data was provided by the Client
2. Contours shown at 1.0m interval.
3. All units shown are in meters unless otherwise stated.

REFERENCES

NAD83 UTM Zone 13.

Original figure produced by SRK consulting (April 2020), updated by Agnico (March 2023).

AGNICO EAGLE

Doris TIA

DORIS TIA OMS MANUAL

South Dam General Arrangement and Instrumentation

DATE:	APPROVED:	FIGURE:
March 2023	BJ	13

OPERATIONS, MAINTENANCE AND SURVEILLANCE MANUAL: HOPE BAY DORIS TAILINGS IMPOUNDMENT AREA

HOPE BAY, NUNAVUT

Appendix E – Emergency Response Plan

AGNICO EAGLE
HOPE BAY

HOPE BAY PROJECT

Emergency Response Plan

Prepared by:

Agnico-Eagle Mines Limited – Hope Bay division

Version 5

June 2022

EXECUTIVE SUMMARY

The Emergency Response Plan (ERP) activates when an emergency, accident or malfunction occurs, or if such an incident is foreseeable. The ERP outlines potential emergency scenarios, initial actions for emergencies and the internal and external resources available including personnel, emergency response equipment and communication systems.

IMPLEMENTATION SCHEDULE

This Plan will be immediately implemented.

DISTRIBUTION LIST

This document is available on the local server W://Public/Safety/Emergency Response Plan

The document is forwarded to the following:

AEM – General Mine Manager

AEM – General Superintendent - Mining

AEM – Health and Safety Superintendent

AEM – Human Resources Superintendent

AEM – Engineering Superintendent

AEM – Exploration Superintendent – Hope Bay

AEM – Environment Superintendent – General Supervisor

AEM – Maintenance General Supervisor

AEM – Logistics Superintendent

AEM – Health & Safety Department

AEM – JOHSC Co-chairs

Updated Hard copies distribution list

AEM – Administration Boardroom

AEM - Geohub Boardroom

DOCUMENT CONTROL

Revision #	Date	Section	Changes Summary	Author	Approver
0	December 2017	Initial Document		D Brown HS Manager	D Brown HS Manager
1	March 2019	Throughout	Combined previous Surface Emergency Response Plan and Underground Emergency Response Plan into one document. Updates to Plan Management and Roles & Responsibilities sections.	B Towle	D Brown HS Manager
2	March 2020	Throughout		K Cook HS Superintendent	D Brown HS Manager
3	February 2021	Throughout	Entire plan revised to reflect Agnico Eagle as the operator.	K Cook HS Superintendent	Norm Ladouceur HS Manager
4	February 2021	6.0	Directions to reference Hope Bay Spill Contingency Plan Appendix Hazardous Materials and Products Specific Spill Response Plans	J Peterson ERT Coordinator	K Cook HS Superintendent
5	June 2022	Throughout	Entire plan revised to reflect Hope Bay's 2022 exploration focus and alignment with look and feel of Nunavut division sites.	B. Towle H&S Superintendent	B Towle H&S Superintendent

Prepared By:

X

Brad Towle
Health & Safety Superintendent

Approved By:

X

Eric Steinmetzer
General Manager

Table of Contents

SECTION 1 - INTRODUCTION

1.1 PURPOSE AND SCOPE OF THE EMERGENCY RESPONSE PLAN

The purpose of this Emergency Response Plan (ERP) is to provide a consolidated source of information for employees, contractors, and site visitors to respond quickly and efficiently to any foreseeable emergency that would likely occur at the Hope Bay site. The objectives of the ERP are to prevent fatalities and injuries, reduce damages to buildings and facilities, and to protect the environment and community. It is a working document that will be reviewed and updated on a regular basis.

This ERP addresses all related activities at all Agnico Eagle active work areas, Hope Bay site surface and underground as well as possible emergency scenarios that may occur off-site. Guiding the development of this document has been the principle that an effective ERP must provide:

- A clear chain of command for safety and health activities.
- Well-defined corporate expectations regarding safety and health.
- Comprehensive hazard prevention and control methods; and
- Record-keeping requirements to track program progress.

AEM will ensure that all employees, contractors, and site visitors fully understand and comply with all legislated safety standards, and the policies and procedures outlined in the ERP.

This ERP will be reviewed annually, or more frequently as required, to ensure compliance with applicable legislation, to evaluate its effectiveness and to continually improve the procedures. All employees, contractors and site visitors are encouraged to offer suggestions for ways to eliminate potential hazards and improve work procedures.

1.2 AEM'S POLICY STATEMENT

AEM is committed to protecting the health and safety of all its workers and the environment, and to adhering to all legislated safety standards. Sustainable development – health, safety, environment, and social acceptability – is integrated into our business strategy and our management principles. For Agnico Eagle, it is a non-negotiable item of good management.

The necessary resources will be available to respond quickly and efficiently to all emergencies to prevent injury to, or degradation of, the health of individuals or the environment. In implementing this emergency response plan, AEM will set preparedness targets and report its progress on a regular basis.

To this end:

> All relevant safety and emergency response laws and regulations will be incorporated into the ERP as a minimum standard senior management is responsible for funding and to ensure other resources are available, including hiring and training qualified personnel, to ensure the successful implementation of the ERP in the event of an emergency.

All supervisors are responsible for ensuring that their employees are aware of, and trained in, the proper emergency response procedures and that procedures and contact information are posted in all work areas. Supervisors are also responsible for ensuring that all employees follow safe work methods and all related regulations to prevent emergencies from occurring, and that they are provided with the proper tools to do so, including Personal Protective Equipment (PPE).

An emergency response team and coordination centre are established at the Hope Bay site. The ERP will be tested on a periodic basis to ensure its effectiveness, minimum of once per year.

1.3 POLICY WITH RESPECT TO CONTRACTORS AND VISITORS

Every person working at or visiting the Hope Bay site receives orientation and site induction on arrival. This orientation outlines what is required to be followed in policies and procedures set forth in this manual. For a list of responsibilities, see Section 3.

1.4 ENVIRONMENTAL POLICY

AEM is committed to achieving a high standard of environmental care in conducting its operations as per AEM's Environmental Policy which includes:

- Compliance with all applicable legislation including laws, regulations, and standards. Where laws do not exist, appropriate standards will be applied to minimize environmental impacts resulting from mining activities.
- Open communication with government, the community, and employees on environmental issues.
- Development and adherence to management systems that adequately identify, monitor, and control environmental risks associated with AEM's mining activities.
- Assurance that the employees are aware of their responsibilities and comply with AEM's Environmental Policies.
- It is the policy of AEM to protect the environment, public health and safety, and natural resources by conducting operations in an environmentally sound manner while pursuing continuous improvement of our environmental performance.

1.5 RELATED DOCUMENTS

The documents listed in Table 1.1 are expected to be referenced and utilized in conjunction with the Emergency Response Plan.

Table 1.1. List of documents related to the Hope Bay Emergency Response Plan.

Document Title	**Year**	**Relevance**
Hope Bay Spill Contingency Plan	2022	Outlines spill response procedures and actions to be taken in the event an emergency incident involves a spill of hazardous materials
Hope Bay Hazardous Waste Management Plan	2020	Reference for management of hazardous waste that may be generated during an emergency response
Hope Bay Non-Hazardous Waste Management Plan	2017	Reference for management of non-hazardous waste that may be generated during an emergency response
Oil Pollution and Emergency Preparedness Plan	2021	Outlines specific spill response procedures and actions to be taken in the event an emergency incident involves a spill of fuel during the annual sealift fuel transfer
Hope Bay Explosives Management Plan	2022	Reference for management of explosives material handling

1.6 RELATED DOCUMENTS

Emergency response management at the Hope Bay site is governed by the Nunavut Mine Health and Safety Regulations (R-125-95 8.32).

SECTION 2 - ACTIVATION OF AN EMERGENCY RESPONSE

Emergency response is activated following the activation of the Code 1 protocol. The protocol is triggered when an employee contacts the incident commander through the radio on Emergency Channel 1 and the Incident Commander acknowledges that this situation requires initiation of the Emergency Response Team. From there, ERT will be dispatched, and crisis management can be triggered if the situation requires it as per the incident commander's assessment.

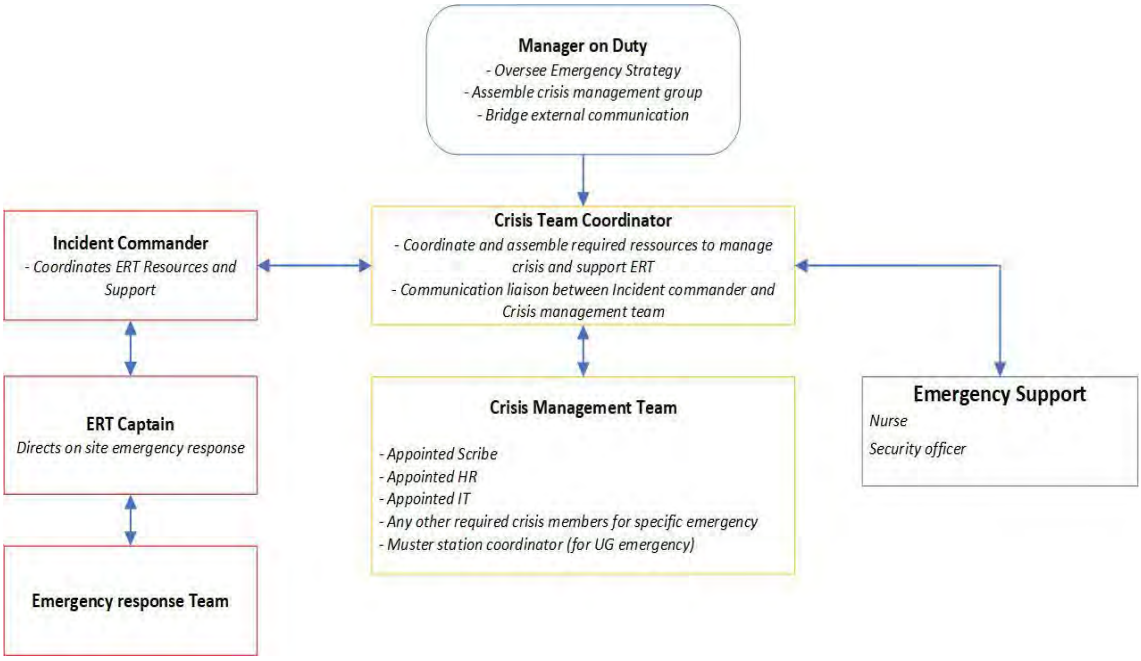
SECTION 3 - ORGANIZATION AND JOB RESPONSIBILITIES DURING CRISIS MANAGEMENT

This section details the roles and responsibilities of all parties involved in emergency response planning and implementation at Hope Bay.

3.1 CRISIS MANAGEMENT TEAM

The Crisis Management Team (CMT) is responsible for directing all work performed and managing all resources during an emergency incident. The CMT is typically formed by senior management or designates performing the various required functions to ensure the safety of all personnel involved. The CMT draws on resources from Safety, Operations, Technical Services, Environment and Maintenance personnel as necessary to complete emergency response tasks. Responsibilities of the CMT are outlined in Section 2.2.1 through 2.2.7 below. Depending on the nature of the emergency, additional managers and personnel may be added to the CMT.

3.2 CRISIS MANAGEMENT TEAM COMMAND STRUCTURE



3.3 SITE MANAGER

The Site Manager is responsible for implementing and maintaining the ERP. In addition, the Site Manager's responsibilities are to:

- Act as a spokesperson on behalf of AEM with the public, media, and government agencies, as required.
- Prepare and submit any formal reports (within the required time frame) to regulators and AEM management detailing the occurrence of an emergency; this includes submitting an incident reporting form.
- Ensure that Health, Safety and Environment have the means (financial and otherwise) to ensure that all required resources are made available or provided from off-site if required.
- Work with the H&S, Human Resources and Environment teams to evaluate what training is required by all staff, ensure that all staff are given appropriate training, and ensure that all staff are retrained as needed.
- Ensure that the Human Resources has the means (financial and otherwise) to ensure that all employees' training requirements are current.
- Ensure that emergency response training practices and emergency response equipment inspections are carried out.
- Ensure that emergency response exercises are conducted annually,
- Ensure that the results of the regular inspections are used to improve emergency response practices and improve relevant plans accordingly.
- Complete an annual review of the ERP and those updated versions are available.
- Ensure that updates to new emergency communications information (new phone numbers, changes in reporting structure, etc.) are distributed as soon as the new information becomes available.
- Keep a formal record of distribution and amendments to the ERP.

3.4 CRISIS MANAGEMENT TEAM (ON SITE MANAGEMENT TEAM)

No single department can handle an emergency alone. Everyone must work together to manage the emergency and coordinate the effective use of all available resources. Therefore, at the time of any emergency requiring the assistance of the crisis management team, the members will report to the Incident Command room(s) in the event of an emergency.

Incident Command Rooms includes:

- Administration Board Room
- Geohub Board Room

The Crisis management team structure lends support, fosters efficiency, and provides additional knowledge during an emergency response situation.

The Official In-Charge (Manager on Duty) maintains the overall coordination and direction of the Emergency and ensures the continued safety of all employees and the public. However, with the help of the Incident Commander or designate of the Area affected by the emergency, they will assist with the development of the overall emergency response.

The remainder of the Crisis management team will be given specific tasks to perform that will assist with the management and coordination of the emergency response plan.

3.5 OCCUPATIONAL HEALTH AND SAFETY COMMITTEE

The Occupational Health and Safety Committee are responsible for:

- Review the emergency response plan on an annual basis.
- Assist with any investigation resulting from the emergency.

3.6 ALL EMPLOYEES

All employees are responsible for:

- Ensuring site and personnel safety.
- Reporting to the nearest Muster Station when a fire alarm is sounded.
- Employees reporting to the Muster Station need to assemble at the placard that has their department name.
- Employee's must be quiet and await the "head count" when mustering to UG refuges.
- Reporting any emergency by using a two-way radio on Emergency Channel 1 to describe the type, the location, and nature the emergency, including possible injuries, trapped personnel, and the presence of any chemical or explosive hazards.
- Knowing the location of first aid stations and supplies, emergency, and safety equipment (e.g., fire water pumps, fire extinguishers, gas monitors, Materials Safety Data Sheets (MSDS), emergency exits, and muster stations.
- Wearing appropriate personal protective equipment (PPE) for the task at hand.
- Reporting all emergencies to their supervisor.

3.7 SUPERVISOR

The Supervisor is responsible for:

- Ensuring personnel under their supervision are accounted for in muster station.
- Informing the incident commander of the emergency in providing details regarding the type, the location, and the nature of the emergency, including possible hazardous materials involved and health and safety concerns.

3.8 OTHER PERSONNEL

Depending on the nature of the emergency (medical, electrical, mechanical, fire, etc.) other site personnel, including the Electrician, Mechanic, and any other, may be called upon to play key roles.

3.9 EMERGENCY RESPONSE CONTACT INFORMATION

An accurate list of available responders will be kept updated as required and communicated to stakeholders.

ERT Roster May 25 to June 1, 2022

Active

Room	D/N	Company	Name
B4	D	AEM	Sanderson, Jason
B32	D	AEM	Gentile, Evan
G13	D	KCMD	Stoddart, Jason
G7	D	KCMD	Andrews, Jamie
G17	D	KCMD	Levac, Leo
G10	D	KCMD	Misponas, Sheldon
B20	D	AEM	Mercer, Mervin
E1	D	AEM	Dunn, Sarah
B11	D	AEM	Britnell, Troy
B6	D	AEM	Hill, Jonathan
B8	D	AEM	Adlem-Qilluniq, Scott
C9	D	AEM	Trahan, Derek
B22	D	AEM	O'Neill, Ron
B15	D	AEM	Munyoro, Edwin

Total Active ERT On Site

AGNICO EAGLE HOPE BAY

14

© Captains ©

Room	D/N	Company	Name
C9	D	AEM	Trahan, Derek
B4	D	AEM	Sanderson, Jason
	D		
	D		

Incident Command & Control On Site

Room	D/N	Position	Name
C4	D	General Superintendent	Desrochers-Gagnon Philemon
C2	D	Health & Safety	Towle, Brad
E13	D	Enviro General Supervisor	Dufor, Guy
C3	D	Exploration Superintendent	Dix, Conrad

Medic On Site Radio Channel 6

Room	D/N	Company	Name
C10	D	AEM	Hamlin, Vicky

ERT Coordinator Radio channel 2

Room	D/N	Company	Name
B4	D	AEM	Sanderson, Jason

Security Radio channel 2

Room	D	Company	Name
B4	D	AEM	Sanderson, Jason

Pandemic Coordinator

Tonia Ajijola

WILDLIFE RESPONSE TEAMS

Radio channel 1 for reporting dangerous sightings IE: Grizzly

Radio Channel 7 for reporting non threatening wildlife encounters

WRT Team #1

Room	D/N	Company	Name
C9	D	AEM	Trahan, Derek
B4	D	AEM	ontVanderwinkle, Guillau

WRT Team spare

Room	D/N	Company	Name

WRT Team #2

Room	D/N	Company	Name
B4		AEM	Jason Sanderson
B32		AEM	Gentile, Evan

WILDLIFE RESPONSE TEAM LEAD* Radio Channel 7

Room	D/N	Company	Name

Table 3.1: Emergency Response Contact Information Chart

Name	Position	Office Phone	Mobile Phone	E-Mail
Eric Steinmetzer	General Mine Manager	819.759.3555 x4600104	(819) 763-0187	eric.steinmetzer@agnicoeagle.com
Philemon Desrochers-Gagnon	General Superintendent	819.759.3555 x4600106	(819) 355-0815	philemon-desrochers@agnicoeagle.com
Emma Geist	Human Resources Superintendent	819.759.3555 x4600138	(819) 860-2898	emma.geist@agnicoeagle.com
Brad Towle	Health & Safety Superintendent	819.759.3555 x4600138	403-714-1350	brad.towle@agnicoeagle.com
Conrad Dix	Exploration Superintendent	819.759.3555 x4600126	(905) 975-6150	conrad.dix@agnicoeagle.com
Philippe Lapointe	Engineering Superintendent	819-759-3555 x4600106	(819) 860-2898	philippe.lapointe@agnicoeagle.com
Dan Izzard	Materials & Logistics Superintendent	819-759-3555 x4600154	(780) 245-4293	dan.izzard@agnicoeagle.com

Table 3.2: Hope Bay Phone Numbers

Health and Safety		
Medics	Vicky Hamelin / Todd MacDonald	4600105
Health & Safety Manager/Super	Brad Towle	4600138
ERT Coordinator		4600103/4600196
Medic's Room	After Hours **EMERGENCY ONLY**	4600115
Trainer	Don Harvey / Jason Sanderson	4600110
Security Officer	Bob Fogarty / John Fitzgerald	4600165
Pandemic Counselor	Louis-Philippe Gélinas	4600174
Surface Operations		
General Manager	Eric Steinmetzer	4600104
Maintenance General Supervisor	Cody Kerr	4600131
Electrical/Inst. Supervisors		4600117
Site Services Supervisor	Derek Trahan / Nelson Bell	4600126
Powerhouse	Norm Bertholds / Scott Adlem-Qilluniq	4600127
Warehouse Superintendent	Dan Izzard	4600154
Warehouse Team Lead	Dave Thomas / Jerry Gill	4600172
Warehouse (General)		4600158
Logistics Coordinator	John Pruden / Kevin Rutter	4600134
Mechanical Lead Hand		4600140
Light Vehicle Shop		4600157
Electrical Shop		4600139
Plumber's Shop		4600109
Electrical Planner		4600177
Mobile Planner		4600186
Mobile Maintenance Supervisor		4600130
Projects		4600122
Human Resources Superintendent	Emma Geist	4600159
Human Resources	Amanda Markmeyer / Tasha Robichaud	4600160
WTP		4600143
Mine Dept.		
Manager of Mining		4600179
Agnico Shift Supervisors / Wicket		4600163
Chief Mine Engineer		4600125
Core Shack		4600148
Senior Mining Engineer	Jian Yong Chen	4600100
Mine Planning	Mike Tanasa	4600132
Surveyor	Mervin Mercer	4600129
Senior Geology	Chris Annan	4600128
Geology		4600161/4600164
Tech Services/Mining Superint.	Philemon Desrochers / Phil Lapointe	4600106
Exploration Logistics	P.-O. Lamontagne / Sheldon Cameron	4600124
Explo Superintendent & Coordinator	Conrad Dix / Guillaume Beaudoin	4600135
KCMD Superintendent	Rod Keats / Charlie Riley	4600113
KCMD Safety/Trainer	Jason Cole / Jason Stoddart	4600119
Mill		
Process Plant Superintendent		4600145
Assay Lab Supervisor		4600173
Mill Control Room		4600150
Mill Shifters & Training		4600152
Mill Metallurgy		4600153
Mill Refinery		4600188
Mill Process Control		4600169

IT		
IT Coordinator	Stephan Quessy	4600178
IT HelpDesk	Yaser Imtiaz / Ali Hasnain	**4606717**
	hb.it@agnicoeagle.com	
Enviro Dept.		
Enviro Superintendent / Gen Sup	Nancy Duquet-Harvey / Guy Dufour	4600102
Environment Coordinator	Guillaume Vandewinkel / Jamie Power	4600101
Environment Tech	William Nalley / Tyler Lausch	4600101
Waste Management	Rob Bond / Jason Silverwood	4600187
Site Contractors		
Kitikmeot Catering Manager	Mike Hollick / Allan Lingwood	4600107
Geotech Supervisors	Michel/James	4600108
Geotech UG Supervisors	Derwin/Glen	4600191
Geotech Health & Safety	Dan Pearson / Steven Pereira	4600114
Geotech Shop		4600170
Public Phones		
Outside Kitchen	Public #1	4600111
Outside Kitchen	Public #2	4600112
Camp	Public #3	4600120
Camp	Public #4	4600121
D Wing	Public #5	4600136
D Wing	Public #6	4600137
E Wing	Public #7	4600181
E Wing	Public #8	4600182
G Wing	Public #9	4600183
G Wing	Public #10	4600184
G Wing	Public #11	4600185

Table 3.3: External Emergency Phone Numbers

WSCC Accident Reporting Line (24 hours) Use 1st	1-800-661-0792
WSCC General Mines Inspector	867-669-4412
WSCC General line (Yellowknife)	867-920-3888
WSCC General line (Iqaluit)	867-979-8500
Stanton Hospital (Emergency)	867-669-4100
Stanton 24-hour hot line	867-669-4115
Stanton Hospital (General Inquires)	867-669-4111
Cambridge Bay Health Center	867-983-4500
RCMP Cambridge Bay	867-983-0123 867-983-1111
RCMP Yellowknife	867-669-1111
RCMP Iqaluit	867-979-0123 867-979-1111
Nunavut Coroner's Office	867-975-7292 867-222-0393
Yellowknife Coroner's Office	867-920-8713
Adlair (Cambridge Bay)	867-983-2569 867-983-2247
Air Tindi	867-669-8218 (Ext. 8292)
Summit Air	867-669-9789 (Ext. 221)
Arctic Sunwest	867-873-4464
Great Slave Helicopters	867-873-2081
Nunavut Emergency Management "Medevac"	800-693-1666
Keewatin Air Medevac	1-867-9202400 1-867-920-2300

3.10 CRISIS MANAGEMNET CENTRE

Crisis management operations will be directed out of the Crisis Management Centre located at the Administration Board Room. Location will depend on the nature and circumstances of the emergency.

- Key decisions will be made, and operations will be managed.
- Technical information to direct emergency activities will be provided.
- A communications centre will be established for emergency operations and to communicate with other organizations.
- Resource procurement will be provided, and resource use will be directed.
- Information on the emergency will be logged for accuracy and disseminated to all necessary internal and external parties.

All responses and mitigation efforts developed at the Crisis Management Team will be implemented through the IC.

In the event of an emergency, security personnel may be required to establish and maintain a security perimeter to prevent or minimize injury to personnel, to preserve evidence for investigation, or to prevent unauthorized access to the scene.

3.11 TRAINING

The Hope Bay ERT Standard outlines the training and standards taken by our emergency response personnel. Emergency response training follows the Nunavut/Northwest Territory Mine Rescue Training Standards.

At least once every year, all persons who are employed at the Hope Bay site shall participate in scheduled evacuation drills and procedures including the fire warning signals in effect at the residence.

At least once every year, all persons who work in the Underground Operations at Hope Bay shall participate in the escape and evacuation plans and procedures including the fire warning signals in effect at the mine. Underground evacuation drills shall be held to assess the ability of all persons in the underground operation to seek refuge and report into the ICG to account for personnel.

The underground evacuation drills shall:

- Be held for each shift at some time other than a shift change.
- Involve activation of all fire alarm systems.
- Include evacuation of all persons from their work areas to refuge station / surface.
- Whenever a change is made in escape/evacuation plans and procedures for any area of the mine site, all persons affected shall be instructed in the new plans or procedures.

SECTION 4 EMERGENCY RESPONSE EQUIPMENT

The Incident Commander & Emergency Response Team members will be familiar with the emergency equipment and tools available and keep up to date of the status and location of emergency equipment.

Table 0.1. Available Emergency Response Tools and Equipment

Emergency Equipment and Tools			
Location	**Category**	**Unit**	**Quantity**
Mine Rescue Room	SCBA	Draeger Pss-5000	8
		4500 Psi Composite Cylinders	16
	CCBA	Draeger BG4	15
		Composite O2 Cylinder	30
		Draegersorb	500 lb.
		Ocenco	2
	Oxygen Therapy	Care vent	2
		BVM	1
	Rope Rescue	Static Rope 300 Ft	2
		MPD	3
		Carabiner	20
		Large Carabiner	2
		Prussic Long	4
		Prussic Short	4
		Break Rack Bar	2
		Single Pulley	6
		Double Pulley	6
		Figure 8	2
		Rope Grab	2
		Rescue Harness	2
	Gas Monitors	Draeger X-AM 5000	1
		Draeger Pac-7000	1
	Extrication Tools	Power Hawk Extrication Set Jaws Cutter Spreader Power Pusher Rams	 1 1 1 3
	First Aid	Stretcher Basket	2
		Backboard	2

Emergency Equipment and Tools			
Location	**Category**	**Unit**	**Quantity**
		Ferno Head Restraint	2
		First Aid Kits	8
		Arm Speed Splints	4
		Leg Speed Splints	2
		Blankets	9
	Confined Space	FAN8-12V Portable Ventilating Fan	1
		FAN-7004CL 25 Ft. Canister Duct	1
	Bunker Gear	Bunker Gear Set	12
	Nozzles	VIPER X 2 30 to 125 GPM	1
		ELKHART X 2 60 TO 150 GPM	1
		Fire Caddy 12 foam inductor	1
		Gated Y's 2 inch to 1.5 inch	3
		Gated Y's 2.5 inch to 2.5 inch	2
	Lay Flat Hose	lengths 2.5" rubber lined 50ft	11
		lengths 1.5" rubber lined 50ft	8
		lengths 1.5" fiber 50ft	2
	Ventilation Fans	Electric air pusher on wheels 110volt	1
		Electric air pusher carry only 110volt	1
		Gas powered air pusher on wheels	1
	Ice Water Rescue Gear	Ice water rescue suits	2
		100ft ice water rescue rope	1
		20ft ice water rescue throw rope	1
		Life jackets	10
		Ice rescue flotation rescue back board	1
	Confined space	Sked rescue body wraps	2
	First Aid	Trauma kits with oxygen	2
Fire Truck	CABINET 1	2.5" inch to 1.5" adaptors	3
		2.5" to 2.5" male female couplers	3
		2.5" to 2.5" female to female couplers	2
		2.5 female cam-lock to 2.5" threaded male adaptor	1
		4" female y to 2.5" male ends	1
		2.5" threaded to 2.5" male cam-lock	1

Emergency Equipment and Tools			
Location	**Category**	**Unit**	**Quantity**
		2.5″ female to 1.5″ female cam-lock	1
		6″ female cam-lock to 4″ male cam-lock adaptor	1
		4″ female to 2.5″ male cam-lock	1
		2.5″ end cap cam-lock	1
		2.5″ female gated y to 1.5″ male ends	2
		Twist lock to a 2.5″ threaded female end	1
		30-125 psi water flow 1.5″ nozzles	3
		90-250 psi water flow 2.5″ nozzle	1
		foam tube adapter to 1.5″ nozzle	1
		2.5″ hose wrenches	2
		1.5″ foam educator	1
		Small pry bars	2
		Flashlight with spare battery	1
		Large pry bar on top cabinet	1
		1.5″ hose wrenches on top of cabinet	2
	CABINET 2	1.5″ ground mount 1.5″ hose connection fan sprayer	1
		50FT 1.5″ Fire hose	4
		10ft rubber lined 1.5″ fire hose	1
		100ft 1.5″ fire hose	1
		1.5″ 20ft hard suction line with no connections	1
		Fire extinguishers	2
	CABINET 3	5 gallon can fuel	1
	TOP OF TRUCK	2.5″ 50ft fire hose	1
		2.5″ 100ft fire hose	1
		1.5″ 50ft fire hose	1
		1.5″ 100ft fire hose	1
	CROSS LAY	1.5″ 100ft rubber fire hose	1
		1.5″ 100ft fire hose	1
	CABINET 4	Toolbox	1
		Pail 2% foam	1

Emergency Equipment and Tools			
Location	**Category**	**Unit**	**Quantity**
	CABINET 5	2.5″ 50ft fire hose	3
		Tank / drum plug kit	1
		bolt cutter	1
		3/4″ foam hose	2
		2.5″ hose wrenches	3
		Cleaning brush	1
	TOP	Large Halogen Bar	1
		Broom	1
		Large pry bar	1
		Hockey stick electrical	1
		Pick pole	1
	INSIDE CAB	PFD	3

SECTION 5 - COMMUNICATION SYSTEMS

The primary basis for communication will be the phone system; back-up communication will be available via satellite phones. For on-site communication, hand-held radios will be available for all employees working or travelling in remote areas from the main camp. Back-up power sources and replacement batteries for communication equipment will be available to provide continuous, uninterrupted operation either at fixed facilities or at emergency sites.

Key site personnel will be accessible at all times by either portable radios, radios in vehicles, or office radios. The Health Care Provider will carry a hand-held radio and will be available at all times. Designated personnel will monitor the emergency channel during day and night.

Lists of employees trained in first aid, mine rescue, and Emergency Response will also be posted.

SECTION 6 - EMERGENCY MEASURES

In the event of an emergency, the employee will have to follow our emergency procedure:

Initiate the emergency by using a two-way radio on Emergency Channel 1 to announce "Code 1, Code 1, Code 1" then when they receive a reply give their name and describe the type, the location, and nature the emergency, including possible injuries, trapped personnel, and the presence of any chemical or explosive hazards.

All work stops in affected area – depending on seriousness of Emergency – the whole site this will be determined by the Official-in-Charge.

Caller – will give a brief description of the Emergency – name, location and what is wrong and/or required.

Dispatcher – will confirm location and details of incident and activate the ERT team.

The person at the casualty(s) will administer First Aid if trained to do so.

Crisis management team will mobilize if required, to ensure that communications, transportation, and effective deployment of ERT resources are conducted. It is mandatory that the Manager on Duty be notified immediately.

The ERT team will assemble as quickly as possible.

6.1 INJURY

In the event of an incident involving injury, evaluate the situation and provide First Aid to your level of training and ability if safe to do so. If the injury is not life threatening and there is no risk of further injury contact your immediate supervisor and report the injury.

If the injury is life threatening, (eg. heart attack, stroke, severe bleed, amputation, breathing distress) evaluate the extent of injuries and administer First Aid if qualified.

- Initiate the Emergency Notification Process.
- If worker is unconscious, check for:
  - Breathing: If worker is not breathing, provide CPR immediately.
  - Bleeding: Control external bleeding immediately ("Direct Pressure" "Elevation" "Rest").
- Secure the location of the injured worker to prevent further injuries to others. Keep the patient as comfortable as possible until Emergency Response personnel arrive on the scene.
- Where serious injury is the result of a hazardous chemical exposure, ensure Emergency Response personnel are advised of the type of chemical the injured worker was exposed to. Refer to product SDS sheets as required.

6.2 FIRE

The Camp accommodations are equipped with fire detection, alarm-warning system and sprinklers. All site operating personnel receive basic training in the use of fire extinguishers.

For any situation involving fires, the first action will be to extinguish the fire if it is safe to do so and then report the incident. If the person cannot safely put out the fire, it must be reported as quickly as possible. In the event of a fire alarm, all employees not directly involved with fighting the fire will report to the designated muster location. Employees will remain in this area until assigned other duties by the ERT or until given an all clear that the emergency is over.

If a fire causes damage to mining equipment, site buildings, or chemical containers, particulates and/or gases could be released into the air, and hazardous materials and/or other chemicals (e.g., fuels, oils, battery acid, lime, etc.) could be spilled. In the short-term, this could result in air quality degradation, and potentially affect the local vegetation in the case of a spill or burn scar. Should such scenarios occur, the following actions will be taken, as required and WHEN IT IS SAFE TO DO SO:

- Air quality monitoring for airborne emissions.
- Collection and incineration of all putrescibles (food items).

- Removal of debris and contaminated soil for disposal on-site or off-site at a licensed disposal facility.

Further details on the clean-up of chemical spills are provided in the Spill Contingency Plan.

The incident commander will:

- Locate the source of fire.
- Dispatch the evacuation at the safest muster point.
- Assign a captain and his team.
- Ensure the safety of all the ERT's members or any other service persons (medics, security guard, electricians, etc...).
- Ensure the ALL CLEAR is given at the end of the emergency, so normal operations can resume.
- If the intervention of the mine inspector is necessary for a special investigation, he will ask to the Health and Safety Department to ensure the integrity of the scene.

Manager on Duty can decide to use any available machinery to separate all or part of a building to protect people or minimize loss.

Incident Reports are to be filed detailing the causes of the fires and responses undertaken. This information will be used by the H&S dept. in subsequent fire prevention activities.

6.2.1 DETECTION OF FIRE & SMOKE UNDERGROUND

Notification called by person discovering the Emergency

Controllable

The person who can control the emergency **MUST**:

Control the emergency to prevent degradation of the situation, the person discovering an emergency must try to control the situation rapidly without taking any risks.

Advise the Supervisor, replace any material or equipment used to control the situation, (i.e. fire extinguishers, hoses, axes, etc.)

Uncontrollable

The person who cannot control the emergency must report the emergency as quickly as possible by calling the emergency using the red button on all radios or dialing the 3911.

The designate person will call a code one and follow emergency protocols, and start contacting the Mine Rescue Trained personnel, (according to the list).

Personnel underground are to remain calm, safely park equipment and immediately proceed on foot to the nearest Refuge Station.

If any of the Refuge stations cannot be reached, proceed to;

A dead-end drift, turn off the ventilation fan, crack open the compressed air line valve. If materials are available, build a barricade, if not, try to build a shelter with your oiler coats, vent tubing, etc. Wait for Mine Rescue Personnel to evacuate you. Remain Calm.

Do not walk-through heavy smoke or in an area contaminated with gas, remember that you cannot see, smell or taste Carbon Monoxide. The first indication of fire / smoke stop, don self-rescuer and remain calm.

Inform every co-worker you meet about the emergency, inform them to evacuate with you.

Keep ventilation doors if any in the position found.

When reporting the emergency on the phone or radio, give the following information:

- Your name
- Type of emergency
- The location of the emergency
- Your location (where you are).
- The names of any co-workers with you

Note: The emergency procedures will be initiated from surface and the emergency teams will get organized, be patient, remain calm. Remember you are in a safe place.

6.2 MUSTER POINT/EVACUATION

If an evacuation is necessary, it is important that all affected personnel leave the emergency area and congregate at a pre-determined area or Muster point so that a head count can be taken when it's an underground muster to determine if there are any missing persons. Employees must remain at the muster point until the supervisor of the emergency area gives permission to return to work.

Upon hearing a fire alarm, smoke alarm, or evacuation alarm you shall

- **Do Not Panic** – Always ensure that you are prepared for the weather conditions – Dress appropriately – (Winter clothing during winter months).
- **DO NOT delay** and **DO NOT stay** and finish work before taking the proper steps to evacuate.
- Always **close** windows/doors as you leave your office etc.
- **Always** head to the **closest EXIT** door and follow **EXIT** signs to the closest outside door.
- Once outside head to the **"Muster Station of the area"**.
- Once at **"Muster Station"** – Stay put until relieved or instructed otherwise by your supervisor.
- **DO NOT enter** a building when the alarm is sounding. Head straight to a **"Muster Station"**.
- **Never** disregard an evacuation alarm. We understand that the system goes off without incident on occasion, but to **disregard an alarm is to endanger your life and the lives of others.**
- **Stay at the "Muster Station"** until you are instructed to **"Resume Operation"** by the Incident Commander.
- **Do Not** leave the **"Muster Station"** to go outside for a smoke. It is important for your supervisor to know where you are at all times – especially during an **"Emergency".**
- The only person authorized to initiate an **"ALL CLEAR"** is the incident commander or the Manager on Duty.
- **Failure to follow** proper Evacuation Procedures will result in Discipline.
- The following areas are considered **"Muster Stations"** (see Figure)

Figure 1 Main Camp & Extension Camp Muster locations

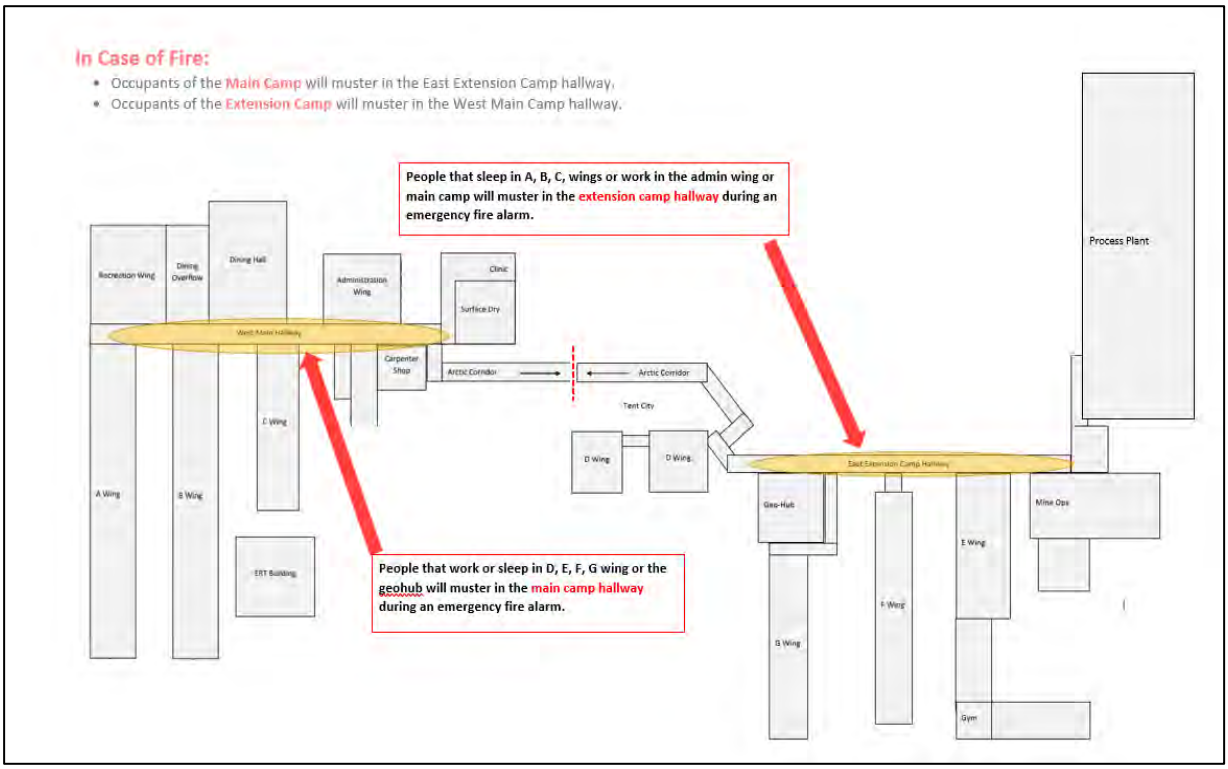
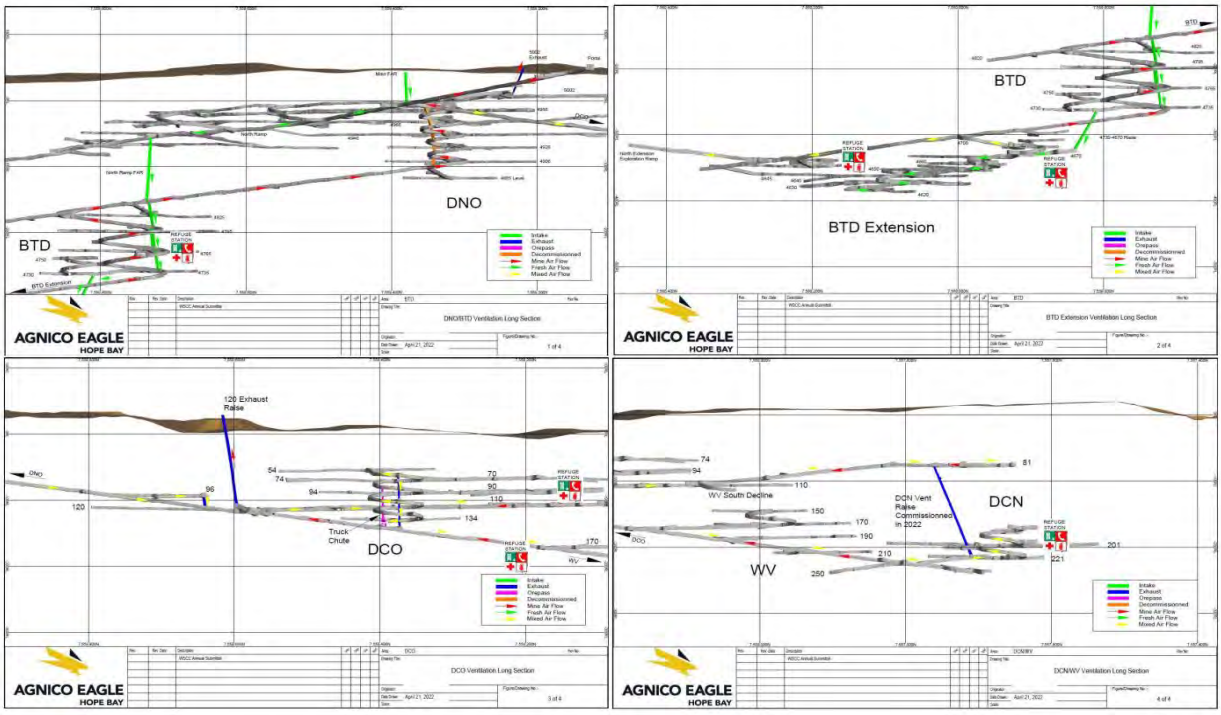


Figure 2 – Mine Safety Evacuation plan



6.3 MEDEVAC PLAN

In the event of serious injury, the individual will be removed from the source of the danger and will be administered emergency first aid. The Incident Commander will be notified immediately in order to take charge of the situation and ensure the safe removal of the injured person to the clinic if possible.

- The ERT team will respond and assist as necessary with equipment, treatment etc.
- As many ERT team members as required will respond to the incident site.
- First Aid will be administered to casualty(s); the casualty(s) will be secured and transported to the clinic. Vehicles transporting casualty(s) will have priority over any other vehicle on site.
- Once the "Mechanism of Injury" and the patient's condition have been assessed, a decision will be made by the Health Care Provider / Medical Director whether a Medevac is required.
- The Health Care Provider will make all necessary arrangements for the medevac.

EVACUATION TO YELLOWKNIFE HEALTH CENTRE

If a **MEDEVAC** is required, the Health Care Provider will call the following

- Med-Response 1-844-633-9999

Further information regarding medevac procedure is available, please refer to Hope Bay Medevac Procedure.

6.4 PANDEMIC

In the event of large scale spread of influenza or similar virus / disease, it is critical to limit human exposure.

Isolate affected personnel and consider separation from the general population.

Use extra care to disinfect camp areas and prevent contamination of public areas.

Contact the NWT Office of the Chief Public Health Officer to notify them of the severity of the outbreak.

Follow the "Procedure - II-0004 Pandemic H1N1 Influenza".

6.5 SUSPENDED WORKER

In the case where a worker has fallen and is suspended from his/her anchor point by means of their fall arrest harness; work in the area shall cease immediately and preparations to initiate the rescue plan shall begin immediately.

Regardless of whether a worker can self-rescue or must rely upon others, time is of the essence because a worker may lose consciousness in only a few minutes.

Workers must be trained to try to move their legs in the harness and try to push against any footholds or stirrups that are available on each harness issued.

If the attempt at self-rescue or the rescue plan fails to retrieve the fallen worker. Initiate the Emergency Notification Process.

Immediately following the retrieval of a worker who has been suspended from height due to a fall, the worker will be escorted to the Medic Station.

Do not make the worker walk any distance. Bring transport directly to the worker.

The worker must then be transported to the Medic for evaluation and for transport to a medical facility to ensure there is no effects from suspension trauma.

Even if the worker was only suspended for a short time they will be required to be examined by a Physician.

6.6 CONFINED SPACE RESCUE

6.6.1 SELF RESCUE

In the event that a rescue is required in a confined space, the worker in cooperation with the confined space attendant shall attempt a self-rescue. A detailed rescue plan shall be provided prior to entry into a confined space. Refer to IV-0003 Confined Space Entry Work Procedure prior to beginning any confined space work.

6.6.2 NON-ENTRY RESCUE

If the rescue plan fails to extricate the worker in the confined space immediately begin the Emergency Notification Process.

A non-entry rescue involves attempting to extricate an incapacitated person without having anyone else enter the confined space. This can be done via a safety line attached to the personnel in the confined space or by grabbing the worker with a rope, strap or pole and pulling them to safety.

6.6.3 ENTRY RESCUE

Entry rescue shall only be completed by trained and competent Mine Rescue / Emergency Response Team personnel. Due to the unique nature of confined space rescues, specialized equipment and training are required to perform a safe and successful rescue.

One of the initial pieces of equipment employed in a confined space is a method of ventilation to disperse collected hazardous gases and introduce fresh air into the environment.

In the event that an entry rescue must be performed, rescue personnel will wear protective clothing appropriate for the situation. This may include a self-contained breathing apparatus (SCBA), protective headgear and the use of explosion proof lighting (to prevent igniting any gases). The rescuer may also wear a full body harness with an attached safety line, especially if a vertical descent is required. To assist in vertical descents, a mechanical winch and tripod may be set up over the access point, if the bottom of the confined space is more than five feet from the entrance.

The rescuers may also carry monitoring equipment by which they can ascertain the quality of the air in the environment. Even if the air quality reading does not indicate any hazardous conditions, it is still recommended that rescuers wear SCBA.

6.7 SEVERE WEATHER

Severe weather events can come in a variety of forms including heavy snow, white out, rain, and wind events. Depending on the event, numerous aspects of the operation may be affected including but not limited to potential harm to people, site access, transportation methods, stability of facilities, and environmental aspects.

Determine the threat of the severe weather event. Supervisors will be required to follow the III-0009 Severe Weather Conditions Procedure to ensure proper steps are taken in the event of a severe weather threat.

Where it has been determined that a severe weather event such as snowstorm/whiteout conditions, heavy rain or high winds pose a threat to the safety and wellbeing of personnel working on site, Supervision will initiate the Emergency Notification Process.

All personnel responding to the Emergency will stop work immediately and proceed to the Administration Building or Assembly Area and contact the Assembly Point Coordinator. Personnel will remain in the Administration Building or Assembly Area and await further instructions.

Supervision will ensure all personnel are accounted for.

A determination will be made on whether safe routine access and egress from the site to the Main Vent Fans can be maintained. If safe access to the Mine Vent Fans cannot be maintained, Supervision will evacuate the underground workings.

If safe egress from the underground cannot be maintained; advise all site employees to remain in refuge in the refuge stations until the severe weather event has passed or lessened to the point where safe egress from the site is assured for all employees.

If travel on site by Emergency Response teams is necessary, determine the hazards of traveling during the weather event and advise responders of the precautions to be taken to ensure safe travel.

6.8 BOMB THREAT – THREAT OF TERRORISM

Bomb threats can be received by telephone, note, letter or E-mail. Most bomb threats are made by persons wanting to create an atmosphere of general anxiety and panic. All such threats must be taken seriously and handled as though an explosive device is in the building.

In the event of a bomb threat or act of terrorism, workers must evacuate the work site and assemble at the Muster Point and remain together until receiving the All-Clear communication from the Official-In-Charge or designate.

Employees must remain calm, survey, and assess their work area. Should a suspect looking device, or a foreign object be found do not touch it. Calmly move away for the foreign looking device, contact your Supervisor and Security.

Personnel must refrain from smoking while being in the Muster Point. The Assembly Point Coordinator will conduct a roll-call to account for all employees at the Muster Point and communicate the results of the roll-call to the Incident Commander via radio communication.

6.9 AIRCRAFT CRASH DISASTER

Plane on fire on airstrip: Plane crew activates fire suppression system and uses hand handle fire extinguisher if safe to do so. If plane continues to burn move employees away from plane and set up spill control for fluids and burnt material.

Plane crash on airstrip: Move firefighting extinguishers as close as safe to do so. Remove crewmembers from plane following safe rescue practices. If the aircraft blocks the airstrip for incoming aircraft take pictures of the affected area and move parts that are blocking airstrip.

Plane crash off airstrip: If helicopters on site use them to access the crash site with onsite emergency crews. In winter months with a good snow-pack use snowmobile or Tucker to access site up to an estimated maximum distance of 15 kilometers. Aerial drones may be utilized as a means to inspect the downed aircraft if physical access cannot be achieved.

6.10 TOXIC GAS RELEASES

In the event of a toxic gas release, the following actions will be taken:

- Immediately evacuate the area/building and notify the incident commander.
- If possible and safety permits, turn off the source of the gas and/or ventilate the area (i.e., open windows/doors to outdoors).
- Isolate the area and restrict access to ERT personnel only; and
- Implement air quality monitoring.

6.11 PIPELINE BREAKAGE

Pipelines will be for reclaim water, freshwater, fuel and domestic sewage on site. Pipeline breakage could lead to localized, short-term smothering of vegetation, the release of poor-quality water, and potentially exposure of mine personnel to infectious or toxic substances. In the event of a pipeline breakage, the following actions will be taken as required and when it is safe to do so.

- Shut off the feed to the pipeline.
- Physically contain the spill through the construction of dikes, berms, sumps and collection ditches;
- Depending the contaminant, it will be removed and stored in its decontamination facility as per environmental policies.
- Monitor for residual contaminants on land and in surface water.

A general response procedure for the handling of spilled substances is provided in the Spill Contingency Plan

6.12 DIKE FAILURE

In the event of a dike failure, the following actions will be taken:

Immediately evacuate the area and pit where failure could affect and notify the incident commander.

Isolate the area and restrict access to ERT personnel only

Use any material, heavy equipment and tools to make temporary or permanent repairs. All work to be conducted under Crisis management Team supervision.

A detailed Emergency Preparedness Plan (EPP) was developed to address the consequences of failure of any of the dikes on site. The procedure was developed by the Geotechnical Engineering team with the assistance of the dike designer (Golder Associates provided the first

version of the dike OMS and EPP, which was then elaborated upon by AEM) and the review of the EMC and the Safety Superintendent. The EPP for the dewatering dikes and Tailings Storage Facility are available in the Operation, Maintenance and Surveillance Manual (OMS manual) for the Tailing Storage Facilities and the Dewatering Dikes.

6.13 UNDERGROUND FIRE

In the event of an underground emergency due to fire, initiate the Emergency Notification Process. Immediately don your MSA W65 self-rescuer and go to the nearest refuge station location and warn anyone on the way.

When you arrive at the refuge station wait to be contacted by surface. The most experienced person must take charge immediately and start filling out the Refuge Station Accounting form (Appendix D).

If you smell stench gas, then go to the nearest Refuge Station.

If workers are unable to make their way to a refuge station or fresh air source, they are to utilize the Ocenco EBA 6.5 SCSR which are located strategically throughout the mine and seek alternate means of refuge.

During an underground fire the Emergency Response Team shall assemble in the Mine Rescue room. The Emergency Response Coordinator or ERT Captain shall provide instruction to the ERT members to proceed and prepare standard equipment and BG4s for an underground fire response.

The Incident Command Group shall begin to assign duties as per the Incident Command Group Duties Underground Emergency /Check sheet. (See Appendix I)

Efforts will be undertaken to ensure ventilation to the Mine is maintained. Operation of the Mine ventilation fans will be guarded and monitored to ensure continuous operation of the fans.

During a fire in the Mine, there will be no alteration to the operation of the surface fans without the authorization of the Incident Command Group. The effects of the alteration to the mine ventilation fans shall be clearly understood before any changes are made.

6.14 MAIN UNDERGROUND VENTILATION FAN FAILURE

In the event of a surface fan failure due to a malfunction, incident, power failure, or other such unplanned or unscheduled event that affects ventilation to the Mine the following will apply:

All work will cease in all areas supplied by mechanical ventilation until the main ventilation system can be restored. Personnel who are underground will retreat to the underground refuge stations and will await the restoration of power and ventilation.

There will be no entry of persons into the mine until the ventilation is restored. Personnel will remain in the underground refuge stations until the all clear is given or the order has been given to evacuate to surface.

Upon restoration of ventilation, air quality testing will be performed in the active workings of the mine affected by the ventilation interruption before personnel are allowed to return to work.

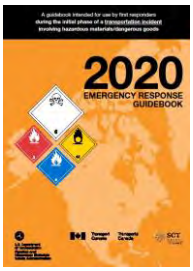
6.15 EMERGENCIES DEALING WITH REAGENTS

For all spills and releases of any hazardous material, the following steps should always be taken:

- Stop the flow of material and/or contain it, using proper safety equipment and precautions.
- Administer first aid if required. If anyone comes in direct contact with cyanide solution decontaminate them immediately, monitor them closely and give oxygen if there is any indication of symptoms of poisoning.
- Contact your supervisor or trigger the Code 1 protocol if the spill cannot by remediated safely
- Secure the area.
- Prevent unnecessary exposure.
- Perform remedial action for cleanup.

First responders might address emergencies involving reagents, by using

EMERGENCY RESPONSE GUIDEBOOK



In an emergency, CANUTEC may be called collect at

613-996-6666 (24 hours)

*666 cellular (Press star 666, Canada only)

6.15 FATALITY OCCURING ON SITE

WORK OR NON-WORK RELATED FATALITY

Incident site must be kept barricaded off and guarded and undisturbed except for the purpose of preventing injury or relieve suffering, until appropriate personnel (RCMP), (Coroner), (Mines Inspector) have conducted their investigations and have released the scene.

Only the coroner or the medical director is eligible to declare that a person is officially dead.

The RCMP shall immediately be notified of a fatality on site and all facilities should be supplied to their representatives in order to assist them for required investigation.

RCMP is the only communication channel that will be issued toward victim's relatives They will make all arrangements in order to make sure that the relatives are aware of the situation.

All communications going out from Hope Bay will be under the control of the Offical-in-Charge.

If involving chemical, biological, radiological or nuclear agent, consult with the Incident Commander regarding the agent dispersed, dissemination method, level of PPE required, location, geographic complications (if any), and the number of person(s) involved.

Ensure that all person(s) involved have the proper level of PPE protection, training and knowledge to deal with the situation.

Notification of a work related fatality (or ''reportable incident'') shall be made to WSCC according to Mine Act and Regs 16:02

RECOVERY AND ON-SITE MORGUE:

Depending on the situation there may be the need to establish a temporary on site morgue. When the need for recovery and an on-site morgue has been identified the following steps should be taken.

- Gather all necessary information and document all findings.
- Wear PPE until all bodies(s) are deemed free of contamination if necessary.
- Establish a preliminary (holding) morgue. The remains should be kept at cool temperature and prevented from freezing.
- According to the situation the site manager will take all actions in order to respectfully evacuate the remaining to the required destination.
- If suspecting contamination, see the decontamination section for decontamination procedures.

- If needed, decontaminate affected bodies before they are removed from the incident site.

6.16 MISSING PERSON

As soon as a worker is missing from his regular work (at beginning of shift or during the day) the supervisor will ensure that the worker's room, workplace, and public areas have been searched, in addition to checking with the Clinic Personnel.

After this primary search, if the worker is still missing, the Manager on Duty, Human Resources and Hope Bay Security must be advised.

Once a missing person is confirmed complete the following steps:

Initiate the Emergency Notification Process

First, the Security Officer or IC will verify if missing person has a cell phone and then try to call this number.

The Security Officer or IC will obtain from room neighbors, colleagues or friends the last area the missing person was seen.

After initial assessment, if further searches are required, the Security Officer will advise the Manager on duty and a Search and Rescue (SAR) operation will be initiated along if a Crisis Management if required.

Searches Inside Main Camp:

If searches are required in the Main Camp wings, the IC or Security Officer will dispatch all ERT members.

IC or Security Officer will assign SAR teams to search rooms.

Each team will be equipped with a radio (on a pre-determined channel) and a flashlight.

Upon finding the missing person: First Aid must be given by a team member if required, and the IC or Security Officer will be notified immediately. At all times, the Patient will be brought to the Medical Clinic for medical evaluation.

Outdoor searches:

If outdoor searches are required, IC or Security Officer will dispatch all ERT members.

A Search and Rescue (SAR) Plan will be initiated depending on alleged location, weather conditions and any other situation affecting the plan.

Every SAR plan will be directed by IC who will report directly to the crisis management team coordinator.

6.17 SEARCH AND RESCUE

Request for Assistance – Search and Rescue

Objective: To establish clear guidelines and procedures when receiving request for Search and Rescue assistance.

Scope: This procedure applies to all person(s) requesting help or assistance where search and rescue is required.

Procedure:

Has the request for assistance been received from the RCMP / and/or the Search and Rescue (SAR)?

Is it a serious injury or a life threatening situation? What is the RCMP assessment of the situation?

Cambridge Bay RCMP – (867) 983-0123

When the local RCMP detachment requests our help we will do our best to help out.

All pertinent information and assessment from the RCMP will be gathered and evaluated.

We will check our equipment and the AEM personnel to see if we could render assistance.

The personnel chosen for (search and rescue) should be approved by the site Incident commander to ensure that we don't put the site at risk

The evaluation of the request must be presented to the Mine manager or (Manager on Duty) for approval prior to dispatching the equipment/personnel.

The process should be monitored by the site incident commander or designate during the rescue, to ensure proper assistance. There should be regular communication with the search authority on progress.

A full briefing and report of the intervention must be presented after the incident has been resolved.

6.18 INTRUDER RESPONSE

This document provides the Hope Bay General Manager with a systematic approach to preventing, and if necessary, responding to incursions into Hope Bay facilities by unauthorized persons or groups intending to cause injury to personnel, damage to equipment, disruptions to operations, or compromise of information.

Use of Police

Police or other local authorities must be contacted as soon as possible and will be used to remove intruder from the facility.

Employees and Contractors

Proactive steps are taken to protect Hope Bay workforce

Protect your own safety and that of all other personnel.

If safe to do so, try to contain intruder until they can be removed by police.

Use the emergency radio channel 1 to instruct all employees to stay away from certain areas that will be defined depending on where the intruder is going.

6.19 ACTIVE SHOOTER

This document provides the Hope Bay General Manager with a systematic approach to preventing, and if necessary, responding, to weapons involved assaults into Hope Bay facilities by unauthorized persons or groups intending to cause injury to personnel.

Use of Police

Police or other local authorities must be contacted as soon as possible and will be used to deal with the active shooter.

Employees and Contractors

Proactive steps are taken to protect Hope Bay workforce

Protect your own safety and that of all other personnel.

Use the public announcement channel to ask all employees to stay away from certain areas that will be defined depending on where the intruder is going.

SECTION 7 - EXPLORATION

7.1 EXPLORATION EMERGENCIES - NEAR DORIS / MADRID

Exploration emergencies that occur within road or ice road access to Doris and Madrid will be initiated via the Emergency Notification Process and Code 1 protocol and be treated the same as Hope Bay site emergencies and fall under the guidelines highlighted under section 6 of this ERP.

7.2 EXPLORATION EMERGENCIES - REMOTE DRILL RIG

In the event of an emergency at a remote drill site during the Heli-season, the ERT team will respond without delay to the Heli-Pad to provide immediate support to remote drill rigs.

In consultation with the Exploration Logistics Coordinator or Exploration Official-in-Charge the ERT team will travel by helicopter to the emergency scene without delay.

Arrangements will be made to stage the ambulance at the Heli-pad for the arrival of the patient.

If any additional equipment or support is required arrangements will be made by Incident Commander to deliver the equipment to the Heli-pad.

The Doris Camp Medic will initiate the medivac procedure upon the determination of a Medivac. Following the Hope Bay Medivac procedure.

7.3 BOSTON CAMP EMERGENCIES

In the event of an incident involving serious injury at the Boston Exploration camp initiate the emergency notification process by using radio Channel 41 to announce a Code 1. Calling a code 1 on radio channel 41 will initiate the Emergency Notification Process and Crisis Management Team. Upon notification of an exploration emergency the ERT team will immediately assemble to respond for an off-site emergency. The response capabilities of the ERT team will be dependent on the season, and the equipment available at the time of the emergency.

- **HELICOPTER SUPPORT**

  During the Heli-season the ERT team will respond without delay to the Heli-Pad to provide immediate support to exploration and transportation to Boston for medical evacuation of the injured party.

In consultation with the Boston Medic and the Exploration Logistics Coordinator the ERT team will travel to Boston to provide medical support and transportation to the Doris Medical Clinic.

Arrangements will be made to stage the ambulance at the Heli-pad for the arrival of the patient.

The Doris Camp Medic will initiate the medivac procedure upon the determination of a Boston Medivac. Following the Hope Bay Medivac procedure.

- **NO HELI SUPPORT**

  If there is no helicopter support in the event of an exploration emergency the ERT team will respond to the emergency and request guidance from the Exploration Logistics Coordinator to determine the best available equipment to utilize during the response. Available equipment options may include:

  - Fat Truck
  - Tucker
  - Rimpel
  - Snowmobile

7.4 BOSTON CAMP MUSTER / EVACUATION

If an evacuation is necessary, it is important that all affected personnel leave the emergency area and congregate at a pre-determined area or Muster point so that a head count can be taken. Employees must remain at the muster point until the Exploration Person-in-Charge gives the all clear.

For specific response measures for emergencies at Boston or any other exploration location follow the steps referred to in section 6 of this ERP.

In the event that the Boston camp can no longer be safely occupied, or due to an emergency incident that affects the safety of people at Boston, or the integrity of the Boston camp, evacuation to Doris Camp must begin.

Figure 7.1

Boston Evacuation Plan

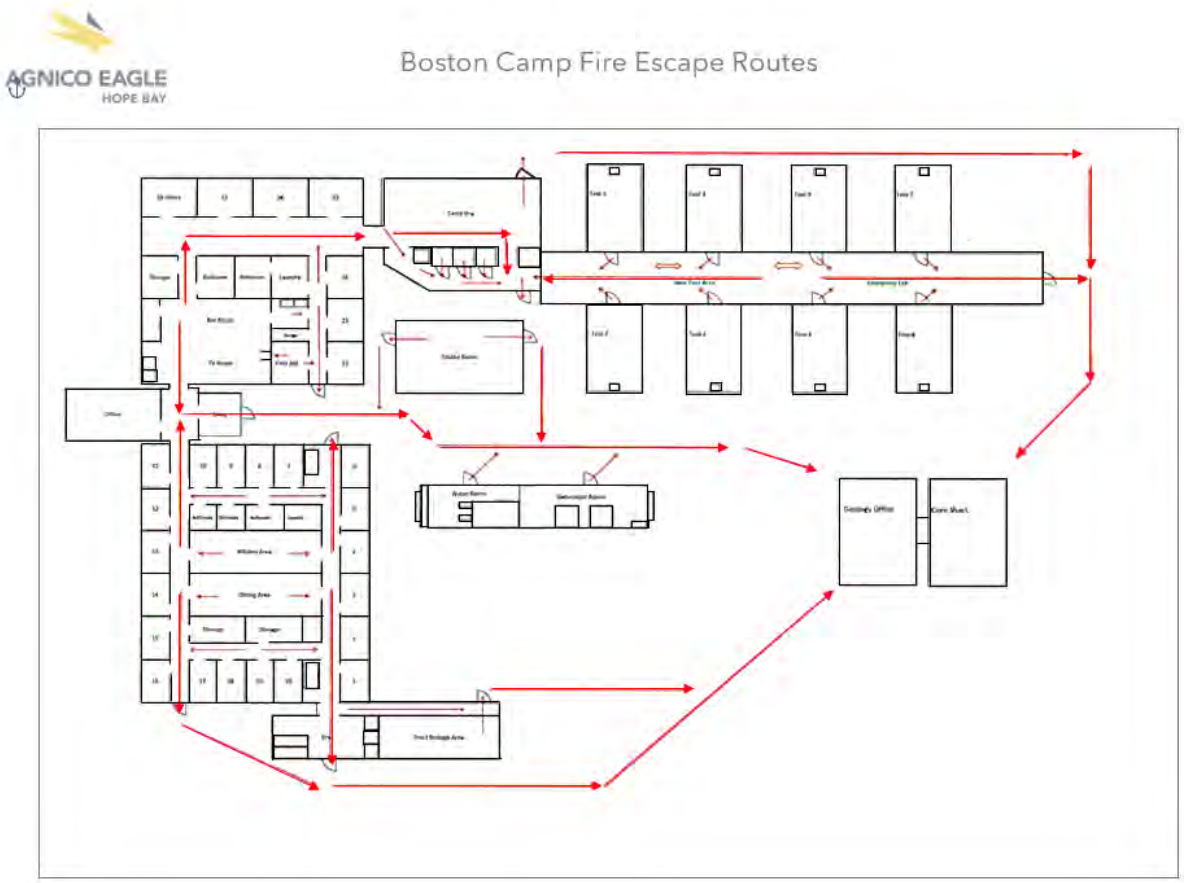
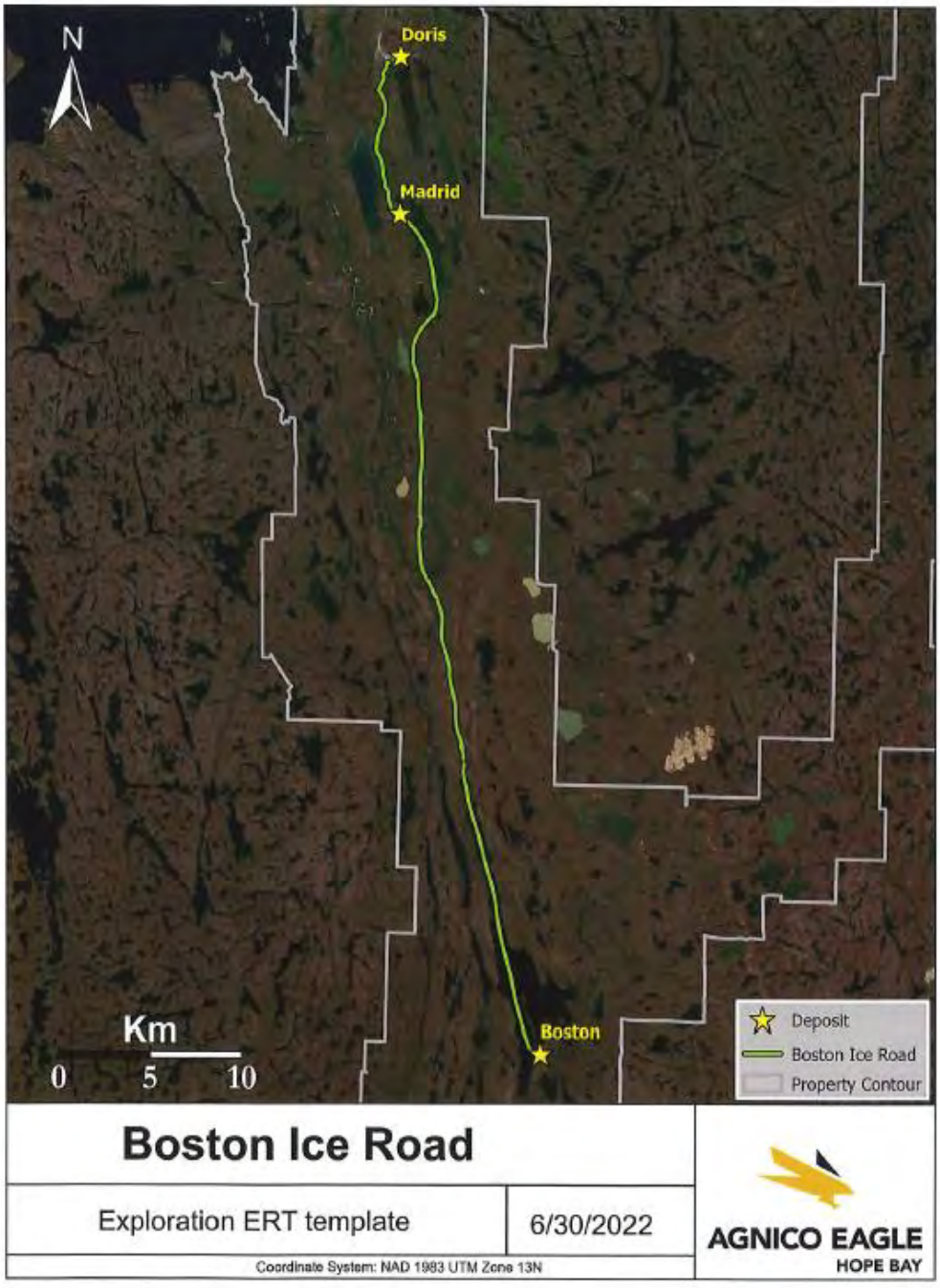


Figure 7.2

Boston Camp Location



7.5 EXPLORATION EMERGENCY RESPONSE EQUIPMENT

In remote areas safety heavily relies on communications and equipment. The Hope Bay facility is equipped with fire response, medical facilities, air and land transport, power generation and trained personnel.

Boston Camp Equipment:

- A medic facility is maintained at the Boston site with trained personnel (nurse) that can treat casualties extracted from the field in the event of injury during operations.
- An approved trauma kit, including an AED, will be stored in a practical location easily accessed in the event of a rescue and each medic on site will be familiar with its contents.

Designated Response Vehicle (Doris Camp):

- The Fat Truck is the designated response vehicle stationed at Doris Camp.
- The Tucker will have a designated response kit stored in the Exploration Logistics Office to be readily available in the event of a response. This includes a survival kit, a first aid kit, wildlife countermeasures, a satellite phone, InReach Messenger.
- Communication with the Fat Truck will be via radio on channel 41 and via InReach GPS and satellite phone when radio contact is not possible.

7.6 EXPLORATION COMMUNICATION SYSTEMS

Key site personnel will be always accessible via either portable radios, office base radios, or email. (Garmin InReach GPS checkins/tracking).

- At the Boston Camp, radios, satellite phones, and internet (email) will be available.
- Back-up power sources and replacement batteries for communications equipment will be available to provide continuous, uninterrupted operation at fixed facilities.
- All personnel working at camp will be equipped with a radio and spare battery. When radio channel 41 is not reachable, vehicles will operate on LADD 1 frequency (line of sight).

SATELLITE PHONE

- To call **from the Sat Phone**, dial: 001-area code-number (ex: 001-819-759-3555)
- Hope Bay Sat Phone: 1-480-768-2500, wait for message, then dial 8816-2241-3018

7.7 EXPLORATION EMERGENCY CONTACT LIST

Guy Gosselin, VP Exploration	VD office 819-874-5980 Ext: 4103600 Cell: 819 856 8124
Denis Vaillancourt: Exploration Special Projects, Manager	Cell: 819-354-9023
Conrad Dix: Exploration Geology Superintendent	Radio Channel 41 HB site: 867-988-6882 ext. 135 Cell: 905-975-6150
Guillaume Beaudoin: Exploration General Supervisor	Radio Channel 41 HB site: 867-988-6882 ext. 135 Cell: 819-279-1749
Chris Annan: Exploration Coordinator Ashley LeBlanc: Exploration Coordinator	Radio Channel 41 HB site: 867-988-6882 ext. 128
Pierre-Olivier Lamontagne: Exploration Logistics Coordinator	Radio Channel 41 HB site: 867-988-6882 ext. 124
Sheldon Cameron: Exploration Logistics Coordinator	Radio Channel 41 HB site: 867-988-6882 ext. 124
Mike Malocsay: Exploration HS Manager	Cell: 720 320 4189
Olivier Grondin: Exploration Manager, Canada	VD office 819-874-5980 ext. 4103611 Cell: 819-860-1219
David Frenette: Environmental Coordinator, Exploration	VD office: 819-874-5980 ext. 4103622 Cell: 819-355-9271
John Buckland: Acasta Helicopters	Direct: 867-873-3306 Cell: 867-765-8254

SECTION 8 - LIST OF ANCRONYMS

AEM	Agnico-Eagle Mines
AANDC	Aboriginal Affairs and Northern Development Canada
AWAR	All Weather Access Road
CDA	Canadian Dam Association
DFO	Fisheries and Oceans Canada
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EMC	Emergency Measure Counsellor
EPP	Emergency Preparedness Plan
ERP	Emergency Response Plan
ERT	Emergency Response Team
ETA	Estimated Time of Arrival
FoS	Factors-of-Safety
GN	Government of Nunavut
HAZCOM	Hazard Communication
HMMP	Hazardous Materials Management Plan
HR	Human Resources
ICC	Incident Command Centre
IATA	International Air Transport Association
KIA	Kitikmeot Inuit Association
MMER	Metal Mining Effluent Regulations
MSDS	Materials Safety Data Sheets
MRT	Mine Rescue Team
NWB	Nunavut Water Board
OHSC	Occupational Health & Safety Committee
PPE	Personal Protective Equipment
SCP	Spill Contingency Plan
TDG	Transportation of Dangerous Goods
WSCC	Workers Safety Compensation Commission
WHMIS	Workplace Hazardous Materials Information System

SECTION 9 - MUTUAL AID AGREEMENTS

Our Mutual Aid agreement with the Northern mining operations includes the following group:

Diavik Diamond Mines Inc.

Call (867) 669-6500 Ext. 5903. Phone number is monitored by Security Control 24 Hours a day.

State that the call is a mutual aid request for the Chief Operating Officer (or Duty Manager on the weekend). Security will transfer the call to the requested Manager. He or She will contact the ERT Advisor to coordinate the requested mutual aid.

DDMI ERT Advisors: Richard Kretzschmar and Dave Arthur (867) 669-6500 ext. 5462

Agnico Eagle Mines Limited (Nunavut Operations):

Call (819) 860-6258 or (819) 759-3555 ext. 4606720 Meadowbank, or

Call (819) 759-3555 ext. 4603911 Meliadine.

State that the call is a mutual aid request for the Mine Manager (or designate – Manager on Duty). Person will transfer the telephone call to the requested Mine Manager immediately and the ERT team will be paged, or the ERT Coordinators contacted.

Meadowbank Emergency Measures Coordinator is Philippe Beaudoin. Office phone number is (819) 7593555 ext. 4606809

Meliadine Emergency Measures Counselors are Dave Loder and Darren Wilcox. Office phone number is

(819) 759-3555 ext. 4603113

Deton'Cho / Nuna JV (Giant Mine Reclamation Project):

Call (867) 669-3702 or Cell (867) 446-2387. Mine Manager Joe Heimbach

Call (867) 669-3722 or Cell (867) 445-2884. Safety Coordinator Randy Thompson

State that the call is for a mutual aid request for the Mine Manager.

Mine Manager is Doug Hayes. Office (867) 669-3715, Cell (867) 444-0355

ERT Coordinator is Steve Millar, Office (867) 669-3717, Cell (867) 445-5620

De Beers Canada – Gahcho Kué:

Call (416) 645-1695 Ext. 6699. Phone number is monitored by Security Control 24 Hours a day.

State that the call is a mutual aid request for the President/COO (or Manager on the weekend). Security will transfer the call to the requested Manager. Security will contact the ERT Advisor to coordinate the requested mutual aid.

Gahcho Kué ERT Advisors: John Gale and Richard Church (416) 645 1695 extension 6701

Dominion Diamond Mines:

Call (867) 880-2201 or (867) 880-4400. Both phone numbers are answered and monitored by Dominion Diamond Mines Security Control 24 hours a day.

State that the call is a mutual aid request for the Mine Manager (or designate on the weekend). Security will transfer the telephone call to the requested Mine Manager immediately and the ERT team will be paged, or the ERT Coordinators contacted.

Dominion Diamond Mines ERT Coordinators are David English and Nathan Pitre. Office phone number is (867) 880-2394.

This Agreement is an expression of shared intent only and does not constitute a binding agreement between the parties. Signed by each party into effect on the dates indicated below.

DocuSigned by:
Rory Moore
6/10/2021

Rory Moore
Interim President
Ekati Mine
Arctic Canadian Diamond Company Ltd

DocuSigned by:
Richard Storrie
6/3/2021

Richard Storrie
President and COO
Diavik Diamond Mines (2012) Inc
Rio Tinto

DocuSigned by:
6/11/2021

Lyndon Clark
General Manager
Gahcho Kue Mine
De Beers Canada Inc

DocuSigned by:
Martin Plante
6/17/2021

Martin Plante
Vice President Operations
Meadowbank Complex, Meliadine, and
Hope Bay Mines
Agnico Eagle Mines Ltd.

DocuSigned by:
Doug Hayes
6/15/2021

Doug Hayes
Mine Manager
Giant Mine Remediation Project
Parsons

DocuSigned by:
6/11/2021

Timothy Sewell
Senior Director HSEST
Mary River Project
Baffinland Iron Ore -

DocuSigned by:
Ray Anguelov
6/15/2021

Ray Anguelov
Operations Manager
Nechalacho Project
Cheetah Resources Ltd

APPENDIX A: MEDICAL EVACUATION PLAN

MEDICAL EVACUATION PLAN

AGNICO EAGLE
HOPE BAY

Medevac Check List

The "Patient Care & Transfer Report" (PCTR) can be found hanging on the wall in Treatment Bay. Can also be found in the MEDEVAC file W:\Medical Clinic\Medevac

The Medical Director and Kitikmeot Physician's on call Schedule is found on the Cork Board in office and treatment room. We receive monthly schedule updates.

No	To Do	Action Required	Complete	Time	√
1	Call Agnico Medical Director/or designate. Upon confirmation of required medevac, follow next steps	Cell: 819-856-5092 (Dr. Lee) Home: 418-527-4810 (Dr. Lee) Dr. Bouchard 1-418-563-5963 (Wife) Dr. Bishop 1-418-930-7236 (duty wk) *See Note at the end of document.			
2	Contact Med-Response to initiate Medevac. **Will make the arrangements if medevac must go to Edmonton ER directly**	Med-Response 1-844-633-9999 Clearly identify Hope Bay mine in Nunavut and that we arrange medevac's ourselves			
3	Call H&S Superintendent (or acting) and confirm: - Incident Commander (IC) - Site Manager (include in medevac email)	Superintendent: 4600-138 (Brad) Or contact on Channel 1			
4	Contact Flight Operations to initiate contact with Medevac provider (Can be done by IC)	Flight Ops - Ch. 4 or 4600-134 Keewatin 1-800-913-4352 Alt 1-204-784-6568			
5	Send out *ONGOING MEDEVAC* email	W:\Medical Clinic\Medevac			

When speaking with Keewatin Air ensure they are aware we are under a "no contact order" with the communities.

*If a patient mix-up/contact is unavoidable, please email Cambridge Bay HR Reps so they can advise GN Public Health officials Email in Medevac Folder | 867-983-2385 *8:30AM-5:00PM (Mon-Fri)*

	Obtain Covid-19 swab on patient and give specimen to lab	*Note* Do not delay MEDEVAC awaiting PCR result			
	Update IC every time there is a change of plan and/or help is required.	IC/Manager, or designate, to update Flight Operations, Site Services etc			
	Give the Medical Director an update of the situation if feasible.				
	Ensure to have worker sign the RTW / FAF and scan with the medevac notes BEFORE giving the worker the originals				

Last Update 2022-06-04 Version 1.0 Page 1/1

APPENDIX B: AGNICO EAGLE CORPORATE EMERGENCY CONTACT LIST

AGNICO EAGLE CORPORATE EMERGENCY CONTACT LIST

Name	Position	Office Phone	Cell Phone	Home Phone	E-Mail	Role
Carol Plummer	Senior Vice President, Sustainability,	416-644-2056 Ext. 4012056	819-354-9877		carol.plummer@agnicoeagle.com	Chair
Yvon Sylvestre	Senior Vice President, Strategic Advisor - Operations	416-847-3711 Ext. 4013711	819-856-5365	905-990-1854	yvon.sylvestre@agnicoeagle.com	Co-Chair
Dominique Girard	Senior Vice President, Operations – Canada and Europe	416-947-1212 Ext. 4013747	*416-568-8513*	450-744-1975	Dominique.girard@agnicoeagle.com	Co-Chair
Guy Gosselin	SVP Exploration	819-874-5980 Ext. 4103600	819-856-8124		guy.gosselin@agnicoeagle.com	Co-Chair
Marc Legault	SVP Operations, U.S.A. and Latin America	416-847-3715 Ext. 4013715	416-271-3460	905-990-1993	marc.legault@agnicoeagle.com	Co-Chair
Patrice Gilbert	VP, Health Safety Social and Public Affairs	416-644-2058 Ext. 4012058	647-281-1193	*H: 905-842-9112*	patrice.gilbert@agnicoeagle.com	Crisis Management Team Coordinator
Louise Grondin	Senior Vice President, People & Culture	416-847-8656 Ext. 4018656	819-724-2020		louise.grondin@agnicoeagle.com	Alternate Chair
Sean Boyd	Vice-Chairman and Chief Executive Officer	416-847-3706 Ext. 4013706	416-419-4431	416-343-3002	sean.boyd@agnicoeagle.com	Spokesperson
Ammar Al-Joundi	President	647-260-3776 Ext. 4013776	416-560-5945	*416-233-9536*	ammar.aljoundi@agnicoeagle.com	Alternate Spokesperson Co-Chair
Jason Allaire	*Senior Corporate Director, Communications, Social and Public Affairs*	819-759-3555 x4608004	819-355-2608		jason.allaire@agnicoeagle.com	Communication Coordinator

Name	Position	Office Phone	Cell Phone	Home Phone	E-Mail	Role
Dale Coffin	Senior Communications Advisor	416-847-8669 Ext. 4018669	647-274-4154	905-844-2197	dale.coffin@agnicoeagle.com	Communication Coordinator
Brian Christie	Vice-President, Investor Relations	416-847-3708 Ext. 4013708	416-625-2518		brian.christie@agnicoeagle.com	Investor Relations Coordinator
Jean-Marie Clouet	Director, Investor Relations	416-947-1212 x4013808	416-457-9464		Jeanmarie.clouet@agnicoeagle.com	Alternate Investor Relations
David Smith	*SVP, Finance & CFO*	416-847-3710 Ext. 4013710	416-917-9713	416-544-8887	david.smith@agnicoeagle.com	Financial Coordinator
Mathew Cook	*Vice-President, Finance*	416-847-3704 Ext. 4013704	416-820-3178	905-677-5765	mathew.cook@agnicoeagle.com	*Alternate Financial Coordinator*
Keith Harris-Lowe	Vice President, People	647-260-3775 Ext. 4013775	647-638-8799	905-237-9397	keith.harrislowe@agnicoeagle.com	HR Coordinator
Michelle Edwards	Corporate Director, Global Rewards & Culture	416-847-1212 Ext. 4018672	647-248-4117	647-242-9889	michelle.edwards@agnicoeagle.com	Alternate HR Coordinator
Cecelia Mimbela	Director, Human Resources	647-260-3784 Ext. 4013784			Cecilia.Mimbela@agnicoeagle.com	Resource
Chris Vollmershausen	SVP Legal, General Counsel and Corporate Secretary	647-260-3771 Ext. 4013771	647-308-9878		Chris.vollmershausen@agnicoeagle.com	Legal Counsel
Greg Laing	General Counsel, SVP Legal	416-644-2052 Ext. 4012052	416-662-9550	905-842-7907	greg.laing@agnicoeagle.com	Alternated Legal Counsel

Name	Position	Office Phone	Cell Phone	Home Phone	E-Mail	Role
Alisha Morrison	HR Generalist	416-847-3701 Ext. 4013701	416-669-2258		Alisha.morrison@agnicoeagle.com	Support Coordinator
Jean Robitaille	Senior Vice President, Corporate Development, Business Strategy & Technical Services	416-847-3720 Ext. 4013720	416-270-2832	905-825-4836	jean.robitaille@agnicoeagle.com	Technical and Strategic Support
Lino Cafazzo	VP Information Technology	416-644-2060 Ext. 4012060	416-278-4148	905-850-1644	Lino-cafazzo@agnicoeagle.com	IT Support
Sam Singh	Corporate Director, Information Technology & Infrastructure Services	647-260-3785 Ext. 4013785	647-988-5632		Sam.Singh@agnicoeagle.com	Alternate IT Support
Michel Julien	Vice President, Environment and Critical Infrastructures	416-947-1212 Ext. 4013738	514-244-5876		Michel.julien@agnicoeagle.com	Environment, critical infrastructure, legacy and regulatory affairs

APPENDIX C: EXPLORATION EMERGENCY CONTACTS

EXPLORATION EMERGENCY CONTACTS

Guy Gosselin, VP Exploration	VD office 819-874-5980 Ext: 4103600 Cell: 819 856 8124
Denis Vaillancourt: Exploration Special Projects, Manager	Cell: 819-354-9023
Conrad Dix: Exploration Geology Superintendent	Radio Channel 41 HB site: 867-988-6882 ext. 135 Cell: 905-975-6150
Guillaume Beaudoin: Exploration General Supervisor	Radio Channel 41 HB site: 867-988-6882 ext. 135 Cell: 819-279-1749
Chris Annan: Exploration Coordinator Ashley LeBlanc: Exploration Coordinator	Radio Channel 41 HB site: 867-988-6882 ext. 128
Pierre-Olivier Lamontagne: Exploration Logistics Coordinator	Radio Channel 41 HB site: 867-988-6882 ext. 124
Sheldon Cameron: Exploration Logistics Coordinator	Radio Channel 41 HB site: 867-988-6882 ext. 124
Mike Malocsay: Exploration HS Manager	Cell: 720 320 4189
Olivier Grondin: Exploration Manager, Canada	VD office 819-874-5980 ext. 4103611 Cell: 819-860-1219
David Frenette: Environmental Coordinator, Exploration	VD office: 819-874-5980 ext. 4103622 Cell: 819-355-9271

OPERATIONS, MAINTENANCE AND SURVEILLANCE MANUAL: HOPE BAY DORIS TAILINGS IMPOUNDMENT AREA

HOPE BAY, NUNAVUT

Appendix F – Dam Emergency Plan

HOPE BAY MINE
DAM EMERGENCY PLAN

AGNICO EAGLE

HOPE BAY, NUNAVUT

MARCH 2023

Hope Bay Mine Dam Emergency Plan

Plain Language Overview:

This Dam Emergency Plan (DEP) is a formal document identifying potential emergency conditions that may occur at Agnico Eagle Mines' Hope Bay Project dams and includes specific preplanned actions to minimize potential failure of the dam or minimize failure consequences including loss of life, property damage, and environmental impacts during an unusual or emergency event.

Hope Bay, Nunavut

Publication Date: March 2023

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Revisions

Revision #	Date	Section	Changes Summary	Author	Approver
0	April 2022	Whole Document	Broad update	AEM/SRK	AEM
1	March 2023	Whole Document	Broad update to align with AEM governance policy for critical infrastructure management and updated Dam Safety Management System including references to the site wide ERP.	AEM	AEM

Contents

Glossary

Term	Definition
Abutment	That part of the valley side against which the dam is constructed. The left and right abutments of dams are defined with the observer looking downstream from the dam.
Acre-foot	A unit of volumetric measure that would cover 1 acre to a depth of 1 foot. One acre-foot is equal to 1,234 cubic meters.
Assembly Point Coordinator	The most senior employee at an assembly point or muster location during an emergency who takes control of the assembly point during an evacuation to take roll-call and account for each person at the assembly point.
Berm	A nearly horizontal step (bench) in the upstream or downstream sloping face of the dam.
Boil	A disruption of the soil surface due to water discharging from below the surface. Eroded soil may be deposited in the form of a ring (miniature volcano) around the disruption.
Breach	An opening through the dam that allows draining of the reservoir. A controlled breach is an intentionally constructed opening. An uncontrolled breach is an unintended failure of the dam.
Briefing Officer (BO)	The Briefing Officer is the liaison between the ICG and the ERT/MRT teams. The BO provides instructional direction to the ERT/MRT teams and is responsible for their safety during an emergency.
Conduit	A closed channel (round pipe or rectangular box) that conveys water through, around, or under the dam.
Consequence classification	A system that categorizes dams (extreme, very high, high, significant, or low) according to the degree of their potential to create adverse incremental consequences such as loss of life, property damage, or environmental impacts of a failure or mis-operation of a dam.
Control section	A usually level segment in the profile of an open channel spillway above which water in the reservoir discharges through the spillway.
Cross section	A slice through the dam showing elevation vertically and direction of natural water flow horizontally from left to right. Also, a slice through a spillway showing elevation vertically and left and right sides of the spillway looking downstream.
Dam	A barrier constructed for the purpose of enabling the storage or diversion of water diverted from a stream or an aquifer, or both and other works that are incidental to or necessary for the barrier.
Dam Emergency Plan	A formal document identifying potential emergency conditions that may occur at the dam and specifying preplanned actions to minimize potential failure of the dam or minimize failure consequences including loss of life, property damage, and environmental impacts.
Dam failure	An uncontrolled release of all or part of the water impounded by the dam, whether or not caused by a collapse of the dam.
Drain	A water collection system of sand and gravel and typically pipes along the downstream portion of the dam to collect seepage and convey it to a safe outlet. The drains can be located in the toe, foundation or drainage blanket.
Drainage area (watershed)	The geographic area on which rainfall flows into the dam.
Drawdown	The lowering or releasing of the water level in a reservoir over time or the volume lowered or released over a particular period of time.

Term	Definition
Emergency	A condition that develops unexpectedly, endangers the structural integrity of the dam and/or downstream human life and property, and requires immediate action.
Emergency Response Team (ERT)	A group of Hope Bay employee's and contractors who voluntarily prepare for and respond to any emergency incident.
Evacuation map	A map showing the geographic area downstream of a dam that should be evacuated if it is threatened to be flooded by a breach of the dam or other large discharge.
Filter	The layers of sand and gravel in a drain that allow seepage through an embankment to discharge into the drain without eroding the embankment soil.
Freeboard	Vertical distance between a stated water level in the reservoir and the top of dam.
Gate	A general term for any mechanical device to control the flow of water in intakes, outlet works and over controlled spillways.
Groin	The area along the intersection of the face of a dam and the abutment.
Height of dam	The vertical distance between the crest of the dam and the lowest point at the downstream toe, which usually occurs in the bed of the outlet channel.
Hydrograph	A graphical representation of either the flow rate or flow depth at a specific point above or below the dam over time for a specific flood occurrence. It can include inflow, outflow or a breach flow.
Incident Command Group (ICG)	Members of AEM management that assemble during an emergency to direct the response to the incident.
Incident Commander	The highest predetermined official available at the scene of an emergency situation.
Inundation area or map	The geographic area downstream of the dam that would be flooded by a breach of the dam or other large discharge.
Low-Level Outlet	A conduit through a dam to allow for controlled release of the reservoir contents. Also see "Outlet Works"
Mine Rescue	Mine rescue is a term used to refer to underground rescue operations performed by the Emergency Response Team.
Muster Station	A designated gathering area for the purpose of identifying and recording all occupants/evacuees present during an emergency and ensuring their safety until the emergency has ended.
Notification	To immediately inform appropriate individuals, organizations, or agencies about a potentially emergency situation so they can initiate appropriate actions.
Official-in-charge (OIC)	The Official-in-Charge is usually the General Manager, or most senior manager and oversees all decisions and emergency operations at Hope Bay.
OMS Manual	Operations, Maintenance, and Surveillance Manual
Outlet works	An appurtenant structure that provides for controlled passage of normal water flows through the dam. Combination of intake structure, gates, conduits, tunnels, flow controls and energy dissipation devices to allow the release of water from the dam,
Persons in the immediate vicinity of the dam:	Considered the persons located immediately downstream and adjacent to the dam where available warning time is very limited (where local emergency authorities could not be expected to respond in time).
Physician Assistant (PA)	Medical health care professional that provides overall site medical duties including critical care during emergency situations under the medical directive of a physician.

Term	Definition
Piping	The progressive destruction of an embankment or embankment foundation by internal erosion of the soil by seepage flows.
Probable Maximum Precipitation (PMP) and Prob. Max. Flood (PMF)	The theoretically greatest precipitation (PMP) or resulting flood (PMF) that is meteorologically feasible for a given duration over a specific drainage area or at a particular geographical location.
Reservoir	The body of water impounded or potentially impounded by the dam.
Riprap	A layer of large rock, precast blocks, bags of cement, or other suitable material, generally placed on an embankment or along a watercourse as protection against wave action, erosion, or scour.
Risk	A measure of the likelihood and severity of an adverse consequence.
Seepage	The natural movement of water through the embankment, foundation, or abutments of the dam.
Slide	The movement of a mass of earth down a slope on the embankment or abutment of the dam.
Spillway (emergency)	An additional spillway, which usually has a crest elevation somewhat higher than the main spillway, designed to activate during extreme flood events to avoid overtopping the dam.
Spillway (main)	The appurtenant structure that provides the controlled conveyance of excess water through, over, or around the dam.
Spillway capacity	The maximum discharge the spillway can safely convey with the reservoir at the maximum design elevation.
Spillway crest	The lowest level at which reservoir water can flow over or into the spillway.
Stop Work	An instruction broadcast over the radio system by the Official-In-Charge instructing specific work to stop.
Tailwater	The body of water immediately downstream of the embankment at a specific point in time.
Toe of dam	The junction of the upstream or downstream face of an embankment with the ground surface.
Top of dam (crest of dam)	The elevation of the uppermost surface of an embankment which can safely impound water behind the dam
WSCC	Workers' Safety and Compensation Commission

1 Overview

The purpose of this Dam Emergency Plan (DEP) is to clearly document the procedures for on-site staff, to be followed in the event of a potential dam emergency at the Agnico Eagle Mines Limited (AEM) Hope Bay Project (the Project). The Dam Emergency Plan is intended to function as part of the Hope Bay Dam Safety Management System (DSMS). This document is linked with the Site Wide Emergency Response Plan. Other key documents comprising the Hope Bay DSMS are the TIA OMS Manual, and the Trigger Action Response Plan, and the Dam Monitoring Standard Operating Procedures. The Hope Bay DSMS is outlined in Section 4.

Dams at the Hope Bay project include: North Dam, South Dam and Madrid North Contact Water Pond (CWP) Berm. This Hope Bay Dam Safety Management System has been prepared with the intent of being consistent with Canadian Dam Association (CDA) and Mining Association of Canada (MAC) guidance. Key components of the DEP include:

- A description of facility components,
- A description of the Hope Bay DSMS,
- Definition of the Emergency response structure and roles,
- Plausible dam-related emergency scenarios.

Notifications regarding an unusual or emergency event at the dam are based on the trigger levels and notification procedure outlined in the OMS Manual and in Section 4 of this document. The alert levels and notification procedure are reviewed annually, or more often if warranted by a change in operational or site conditions.

1.1 Relevant Legislation and Guidance

Jurisdiction	Government of Canada and Kitikmeot Inuit Association (KIA)
Governing Bodies	Authorities involved with permitting and regulating the design, construction, operation, maintenance, surveillance, and closure of the tailings impoundment area include the following groups: • Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) • Kitikmeot Inuit Association (KIA) • Nunavut Impact Review Board (NIRB) • Nunavut Water Board (NWB) • Workers Safety and Compensation Commission Chief Mines Inspector (per the Mine Health and Safety Act) and its associated regulations (Government of Nunavut, 1995)
Guidance of Contents	**Canadian Dam Association (CDA)** • Dam Safety Guidelines (CDA 2007) – Guidance related to development of Emergency Response Plans • Dam Safety Guidelines (CDA 2013) – Guidance related to design and operation of dams

- Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (CDA 2019) – Guidance related to design, operation and closure of tailings dams
- Note: Although the Madrid North CWP is designed to be operated with a maximum two week residence time, it still meets the definition of a mining dam and thus the CDA guidelines have been consulted for best practice.

Mining Association of Canada (MAC)

- Developing an Operations, Maintenance and Surveillance Manual for Tailings and Water Management Facilities (2019) – Guidance related to the management of Tailings Facilities and Water Management Facilities

Nunavut Water Board (NWB)

- Water License No: 2AM-DOH1335, Amendment No. 2, Doris-Madrid Project, Nunavut (2013). Amended December 7, 2018. Expires March 30, 2035.

1.2 Related Documents

The documents listed in Table 1.1 are expected to be referenced and utilized in conjunction with the DEP.

Table 1.1. List of Documents Related to the Hope Bay Mine Dam Emergency Plan

Document Title	Year	Relevance
Hope Bay Project Emergency Response Plan	June 2022	Part of the Hope Bay DSMS. Provides information about required action to handle emergencies at the Hope Bay site in compliance with Nunavut Mine Health and Safety Regulations 8.32
Operations, Maintenance and Surveillance Manual: Hope Bay Project, Phase 2, Doris Tailings Impoundment Area	2022	Part of the Hope Bay DSMS. Describes how AEM will manage and monitor the tailings impoundment area, including the impoundment dams, tailings and water pump and pipeline systems.
Doris TIA Trigger Action Response Plan	2022	Part of the Hope Bay DSMS. Defines specific conditions and thresholds corresponding to each trigger level for the dams and water reclaim pond. Outlines initial actions to be taken at each trigger level, and includes the notification procedure for communication changes in trigger levels.
Operations, Maintenance and Surveillance Manual: Hope Bay Project, Madrid North Contact Water Pond	2022	Describes how AEM will manage and monitor the Madrid North CWP, including the stability of the berm, contact water in the pond basin, and ancillary structures such as seepage collection sumps at the waste rock pile that pump back to the contact water pond.

North Dam Monitoring: Standard Operating Procedure	2022	Provides monitoring requirements for North Dam and includes facility specific guidance on determining alert levels.
South Dam Monitoring: Standard Operating Procedure	2020	Provides monitoring requirements for South Dam and includes facility specific guidance on determining alert levels.
Hope Bay Project Spill Contingency Plan	2022	Outlines spill response procedures and actions to be taken in the event an emergency incident involves a spill of hazardous materials
Hope Bay Project Hazardous Waste Management Plan	2020	Reference for management of hazardous waste that may be generated during an emergency response
Hope Bay Project Non-Hazardous Waste Management Plan	2020	Reference for management of non-hazardous waste that may be generated during an emergency response
Oil Pollution Prevention Plan and Emergency Plan	2020	Outlines specific spill response procedures and actions to be taken in the event an emergency incident involves a spill of fuel during the annual sealift fuel transfer
Hope Bay Project Explosives Management Plan	2017	Reference for management of explosives material handling
Doris and Madrid Water Management Plan	2022	Describes the water management procedures including discharge from the TIA and associated water quality criteria

1.3 Plan Management

The Crisis Management Team (CMT) is responsible for directing all work performed and managing all resources during an emergency incident. The CMT is typically formed by senior management or designates performing the various required functions to ensure the safety of all personnel involved. The CMT draws on resources from Safety, Operations, Technical Services, Environment and Maintenance personnel as necessary to complete emergency response tasks.

The Responsible Person or their designate is responsible for reviewing and revising this Plan annually.

2 Facility Components

North Dam

The North Dam impounds the Reclaim Pond and was designed as a water retaining structure with the following components:

- central frozen core with secondary upstream GCL
- construction from quarry rock including processed fines for core, 150 mm nominal sized transition material, and run of quarry (ROQ) outer shell
- key trench equipped with 12 horizontal thermosyphon evaporators to ensure frozen foundation conditions

Note: The North Dam has been in place since 2012. Design criteria and parameters are provided in Section 1.6.

South Dam

The South Dam is a frozen foundation dam design to retain tailings solids consisting of:

- construction from quarry rock including ROQ, transition material and overliner material placed along the GCL liner.
- an upstream GCL keyed into the permafrost overburden foundation.

Note: The South Dam has been in place since 2019. Design Details are provided in Section 1.6.

Construction Material

Construction materials are sourced from local rock quarries and include

- ROQ material and
- different grades of processed material attained through crushing and screening.

Tailings Deposition

Tailings are deposited as a beach from the face of the South Dam. At all times a minimum 100m long beach will be maintained. In Phase 2, to accommodate the increased tailings quantities, the South Dam will be raised

- by 8 m in a downstream configuration
- to reach a crest elevation of 46.0 m.

Note: Design details are provided in Section 1.6.

Madrid North CWP

A CWP is required at the Madrid North site to intercept and manage contact water runoff from the Madrid North waste rock pile (WRP). The design of the CWP incorporates a run-of-quarry (ROQ) berm with a geomembrane liner on the upstream face to contain contact water. The CWP liner is anchored and sealed to bedrock at the toe of the berm's upstream slope. The berm was founded on exposed bedrock and areas of frozen overburden soil. Permafrost present within the berm foundation will be maintained due to the thermal protection of the berm fill. The CWP design is presented in SRK (2019).

The CWP is formed by a 200 m long embankment of maximum height 7.5 m. The CWP is located 250 m south of the Madrid mine portal and associated facilities. The pond is designed to be operated with a two-week residence time and pumped regularly to remove accumulating water. The pond has the capacity to retain a volume up to 12,200 m^3.

Based on hypothetical dam breach studies the Madrid CWP is a low-consequence dam. An embankment failure at the Madrid CWP would not lead to an emergency scenario threatening loss of life, or irreversible damage to the environment.

2.1 Directions to Facilities

The dam facilities at Hope Bay are accessible by light vehicle year-round. Operating light vehicles at Hope Bay requires Site Driver Training. Access routes to the facilities is detailed below

North Dam

From the airstrip, follow the Primary Road south towards Doris Camp. Follow the Primary Road around the perimeter of Doris Camp to the east, then follow the TL Access Road east for approximately 2 km to reach the North Dam.

South Dam

From the airstrip, follow the Primary Road south towards Doris Camp. Follow the Primary Road around the perimeter of Doris Camp to the east, then follow the TL Access Road east for approximately 6 km to reach the South Dam.

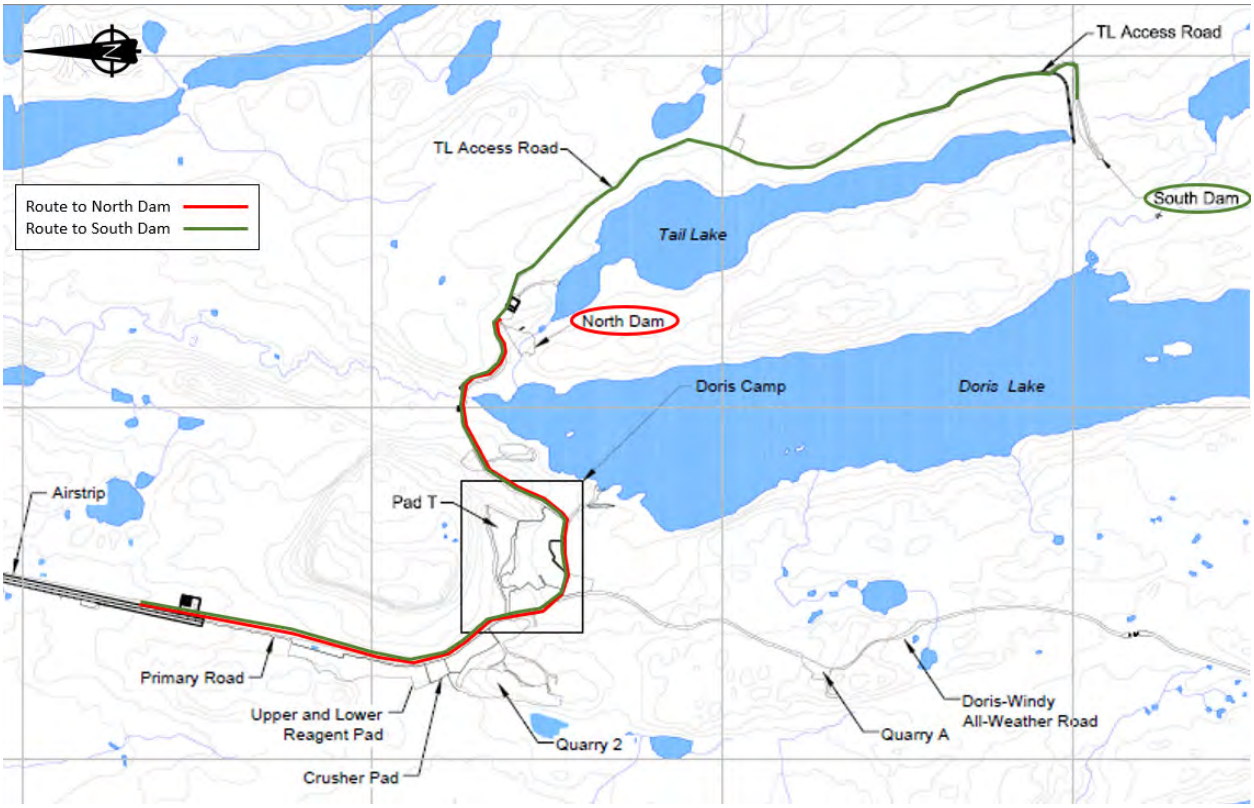


Figure 2-1 – North and South Dam Access Routes

Madrid Contact Water Pond

From the airstrip, follow the Primary Road south towards Doris Camp. Continue past Doris Camp to the south, then follow the Doris-Windy All Weather Road for approximately 12 km to reach the Madrid North CWP.

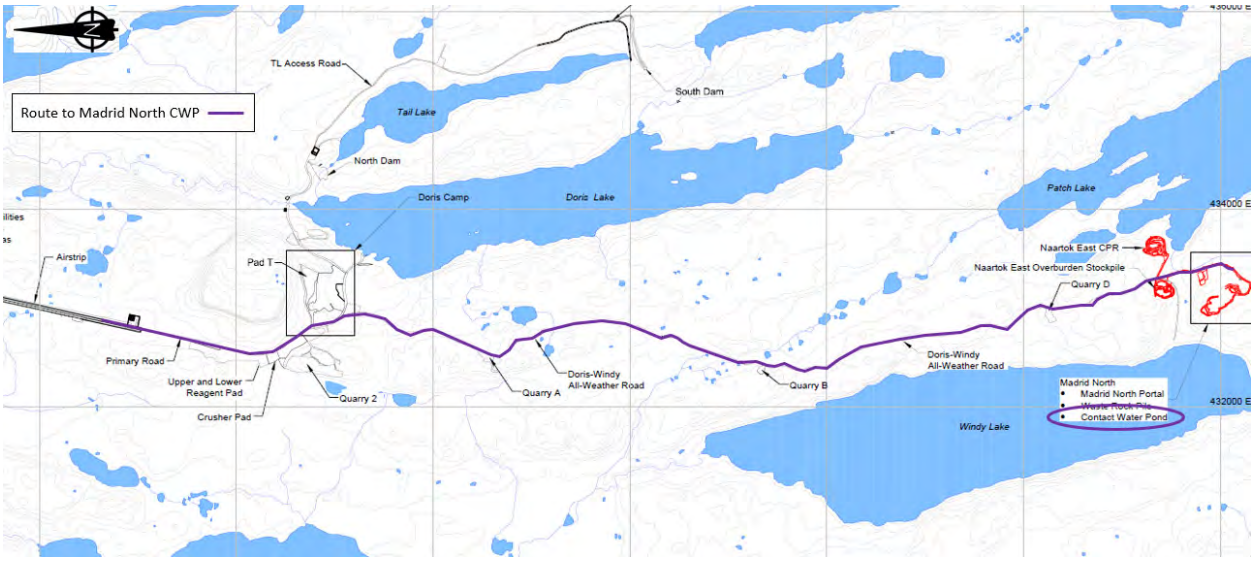


Figure 2-2 – Madrid North CWP Access Route

2.2 Dam Hazard Classification

The dams associated with the TIA area consist of

- **North Dam** - Frozen core rock fill dam with GCL
- **South Dam** – Frozen foundation dam with GCL. Constructed in two phases with downstream raises of GCL and rock fill.

The North and South Dams were assigned a dam hazard classification in accordance with the CDA (2013) dam safety guidelines, as well as the CDA Technical Bulletin on Application of Dam Safety Guidelines to Mining Dams (CDA 2014, CDA 2019).

	North Dam	**South Dam**
Population at Risk	significant	significant
Loss of Life	significant	significant
Environmental and Cultural Values	high	high
Infrastructure and Economics	low	low
Overall Hazard Classification	**high**	**high**

The Madrid CWP is a low-consequence dam. a Dam Safety Review is not required for low-consequence dams. However, the consequences of failure should be reviewed periodically, since the consequences may change with downstream development. If the classification increases, or if it is found that the CWP is not being operated as a dry facility, then a Dam Safety Review may be required.

2.3 Design Criteria and Parameters

The basis of design, design criteria, and design parameters for the TIA dams are outlined below (SRK 2017).

Description	North Dam	South Dam
Secondary Seepage Barrier	GCL	GCL
GCL Deployment Slope	2.5H:1V	3H:1V (4H:1V for the raise)
Crest Centerline Length	220 m	515 m
Maximum Height	11.0 m	14.0 m
Final Crest Elevation	37.5 m	46.0 masl
Initial Crest Elevation	n/a	n/a
Core/GCL Elevation	35.0 m	45.0 m
Full Supply Level	33.5 masl	44.5 masl
Normal Water Level	Typically 32m masl, or lower, against the North Dam. Targets set annually and documented in the TIA Annual Geotechnical Inspection reports.	
Total Freeboard	3.3 m	1.5 m
Hydraulic Freeboard	1.8 m	0.5 m
Thermal Protection above Frozen Core	2.5 m	n/a
Settlement and Allowance	1 m	0.47-0.67 m (Foundation thaw of 1 m) 2.45-3.85 m (Foundation thaw of 7 m)
Deformation Allowance (Total Strain due to Creep)	<2%	n/a
Crest Width	13 m	10 m
Upstream Structure Slope	6H:1V	4H:1V
Downstream Structure Slope	4H:1V	2H:1V
Key Trench Depth	Varies	4.0 m
Key Trench Upstream Slope	0.5H:1V	2H:1V
Key Trench Downstream Slope	0.5H:1V	1H:1V
Dam Hazard Classification	HIGH	HIGH
Design Life: Active use period as water retaining structure Design basis as active water retaining structure	 17 years 22 years	

Description	North Dam	South Dam
Active use period as solids retaining structure Design basis as solids retaining structure Total life until breach	 22 years	17 years 25 years
Production Life	17 years	
Tailings Solids Content	35% solids (by weight) initially, increasing to 65%	37.5% solids (by weight)
Tailings Specific Gravity	2.85	
Deposited Tailings Dry Density	1.3 t/m^3(1)	
Ice Entrainment Allowance: Percentage of tailings capacity By volume	 20% 2.4 Mm^3	
Tailings Beach Slope: Subaerial tailings Sub-aqueous tailings	 1.0% 1.0%	
Annual Exceedance Probability (AEP) for Risk Based IDF	1/2475 (0.0004)	
AEP for Standards Based IDF	1/3 between 1/1000 and the Probable Maximum Flood (PMF)(1)	
Static Stability Factor of Safety Long-term (Drained Conditions)	1.3 during construction 1.5 during operation and closure 1.2 to 1.3 partial or rapid drawdown	
Stability Factors of Safety (Pseudo-Static)	1.0 during earthquake	
AEP for Earthquake Design Ground Motion	1.2 post earthquake	
Peak Ground Acceleration (PGA)	0.060g(2)	0.036g
Mean Annual Air Temperature Climate Change	+6.8°C up to year 2100	
Thermal Design Freezing Point Depression Tailings Overburden Frozen core	 n/a -8°C -2°C	 0 to -1°C -2°C n/a
Seepage Allowance	78 m^3/day	50 m^3/day

Notes:
(1) Value based on experiential engineered judgement.
(2) A peak ground acceleration for a 1/2475 return period was not available at the time of design of the North Dam, and therefore the PGA of 0.06 g was selected based on published data for Kugluktuk. This is further described in SRK (2007).

2.4 Dam Break Analysis

In determining the dam hazard classification, in the context of the TIA Dams, consideration was given to tailings supernatant water and tailings solids reaching the receiving environment. In the context the Madrid North CWP, consideration was given to mine contact water reaching the receiving environment. Based on the hypothetical dam breach studies the Madrid CWP (Appendix A) is a low-consequence dam. An embankment failure at the Madrid CWP would not lead to an emergency scenario threatening loss of life, or irreversible damage to the environment.

The breach scenarios described below are intuitive, although likely extremely conservative. Nonetheless, these scenarios were adopted in assigning the dam hazard classification for the structures. A high-level dam breach analysis was completed for the North and South Dam in 2019 by SRK. Results are available in Appendix B.

North Dam

Breaching of the North Dam would reach

- Tail Lake outflow,
- Doris Lake, Doris Creek,
- and Little Roberts Lake further downstream.

Supernatant Water

Supernatant water could conceivably reach the entire north downstream catchment all the way to Roberts Bay.

Note: under a conservative case where the largest possible volume of supernatant water (over 12 Mm^3) is discharged rapidly over a period of less than 8hrs, then the Doris Creek Bridge would also be damaged.

Tailings Solids

Based on the current deposition plans (off the South and West dams on the south end of the TIA) there is no conceivable chance of tailings mass solids being released as a result of a breach of the North Dam.

South Dam

Breaching of the South Dam would reach

- Ogama Lake,
- Ogama Lake outflow, and
- Subsequently, Doris Lake.

Supernatant Water

Supernatant water would eventually progress all the way along the drainage network to Roberts Bay.

Tailings Solids

A breach of the South Dam could result in tailings solids releasing

- into Ogama Lake and
- though a remote chance, into the Ogama Lake outflow and ultimately Doris Lake.

Tailings solids would not be expected to be transported any further than Doris Lake, with most tailings between the South Dam and down to and into Ogama Lake.

Madrid North CWP

The modelled scenario is for a worst-case hypothetical condition where the Probable Maximum Precipitation (PMP) event occurs while the CWP is partially full due to a pumping or water management failure. During this

hypothetical event, it is assumed that the pond would overtop causing a hydraulic failure of the embankment and releasing the stored water and PMP volume.

Results show the potential for a flow path to the current Madrid portal area. However, the risk to personnel, vehicles, and infrastructure by this flow is very low. Maximum flow depths in the location are less than 0.2 m.

3 Dam Safety Management System

Definition

The Hope Dam Safety Management System (DSMS) is a collection of documents and system that define the safe operation and management of the North Dam and South Dam at the Doris TIA. This Dam Emergency Plan is a part of the DSMS, its function with respect to other key documents is outlined in Section 3.1 below.

Objectives

- Act as a prescriptive framework of documents that to be referenced during operations
- The documents work together to define the approach to dam safety at Hope Bay

Components

The key documents comprising the DSMS include:

- Hope Bay Doris TIA OMS Manual
- Doris TIA Trigger Action Response Plan
- Dam Monitoring Standard Operating Procedures
- Hope Bay Project Dam Emergency Plan
- Hope Bay Project Emergency Response Plan

3.1 Dam Safety Management System Key Documents

The function of each document is described in Table 3-1 - DSMS Key Document Definitions below. The relationship and references between the documents are outline in Figure 3-1Table 3-1 below.

Table 3-1 - DSMS Key Document Definitions

Document	DSMS Function
Hope Bay Doris TIA OMS Manual	• Main Operational document for the Doris TIA • Defines the Dam Safety Management System framework for Hope Bay • Contains (Appendices) or references other key DSMS documents

Doris TIA Trigger Action Response Plan	• Appendix G of the Hope Bay TIA OMS Manual
	• Define the conditions and thresholds corresponding to each trigger level for the North Dam, South Dam, and the TIA Reclaim Pond Water Elevation
	• Defines initial actions to be taken for operational trigger levels:
	  o Green: Normal Operating Conditions
	  o Yellow: Early Warning Conditions
	  o Orange: Corrective Action Conditions
	  o Red: Emergency/Uncontrolled Condition
	• Specific conditions and thresholds are defined for instrumentation data readings, as well as visual observations from inspections.

Dam Monitoring Standard Operating Procedures	• Appendix H of the Hope Bay TIA OMS Manual • Describe in detail the requirements and procedures for dam monitoring under normal operating (Green) conditions
Hope Bay Project Dam Emergency Plan (this document)	• Appendix F of the Hope Bay TIA OMS Manual • Activates in the event of an emergency at any of the dams on site. • Further defines the initial response to an emergency condition at the dams (Red Trigger Level). • Includes the personnel, equipment and communication systems available to respond to an emergency situation at the dams. • Is linked the Hope Bay Project ERP
Hope Bay Project Emergency Response Plan	• Appendix E of the Hope Bay TIA OMS Manual • Activates in the event of an emergency on site. • Defines the initial response to an emergency. • Includes the personnel, equipment and communication systems available to respond to an emergency situation.

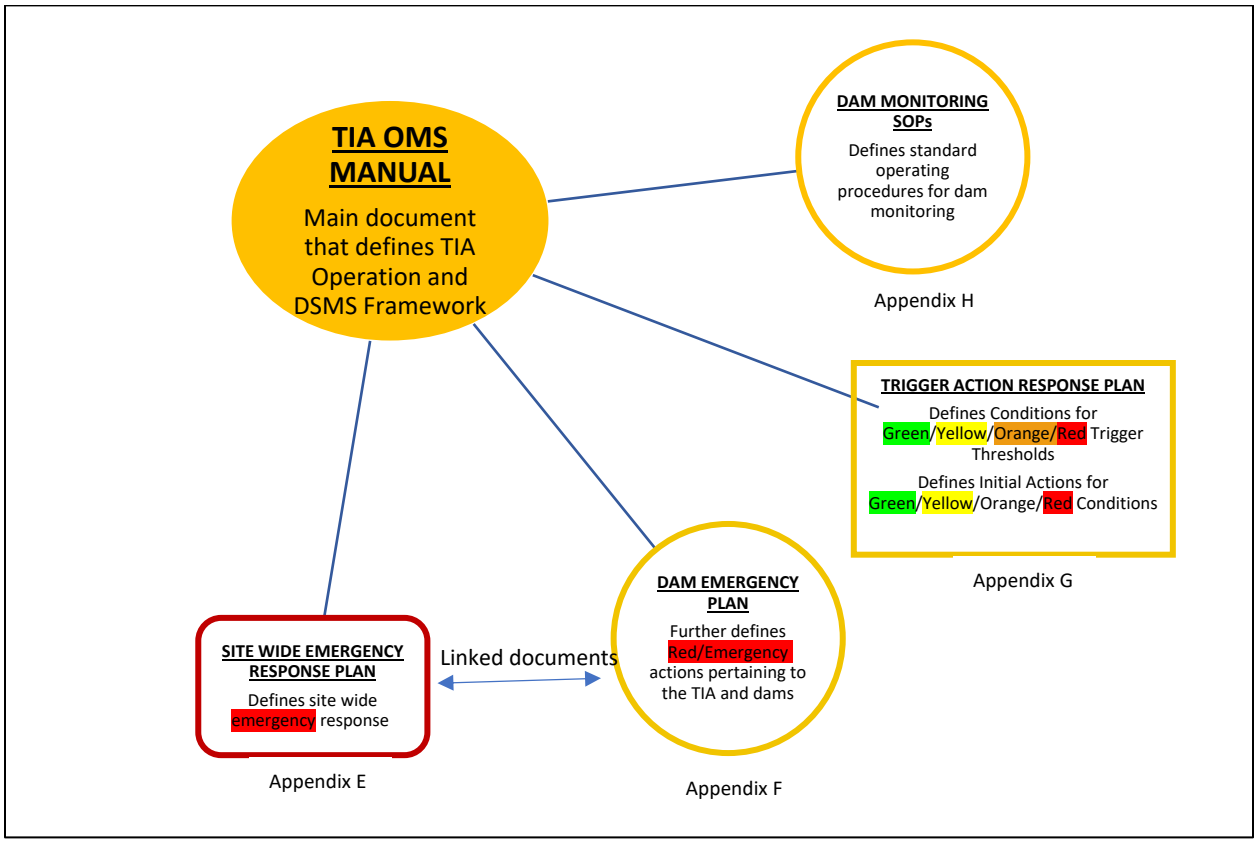


Figure 3-1 - DSMS Document Relationships

3.2 Definition of the Trigger Action Response Plan Levels

The Trigger Action Response Plan defines the initial actions to be taken in response to specific conditions observed at the TIA and dams. The following table defines each of the trigger levels for the Hope Bay Project.

Table 3-2 - Definition of Trigger Levels

Trigger Level	Condition	Definition
Green	Normal Operating Condition	Maintain normal operating procedures.
Yellow - Level 1	Early Warning Condition	Areas of concern identified - Requires further investigation to determine **requirements for increased monitoring**
Orange - Level 2	Corrective Action Condition	High Risk Situation - Requires mitigation actions or operational controls to prevent an emergency situation from developing. **Implement Level 2 Actions.**
Red - Level 3	Critical Condition	Emergency Situation - Immediate threat to health and safety or environment that is uncontrollable through operational controls or mitigation actions. **Implement the site wide Emergency Response Plan and/or Dam Emergency Plan**

3.3 DSMS Communication and Decision Making

Figure 3-2 indicates the communication and decision processes when the threshold criteria are met and when pre-defined action need to be implemented. Table 3-3 : Communication Procedure to Change TARP Level indicates the communication procedure to follow when changing the TARP level.

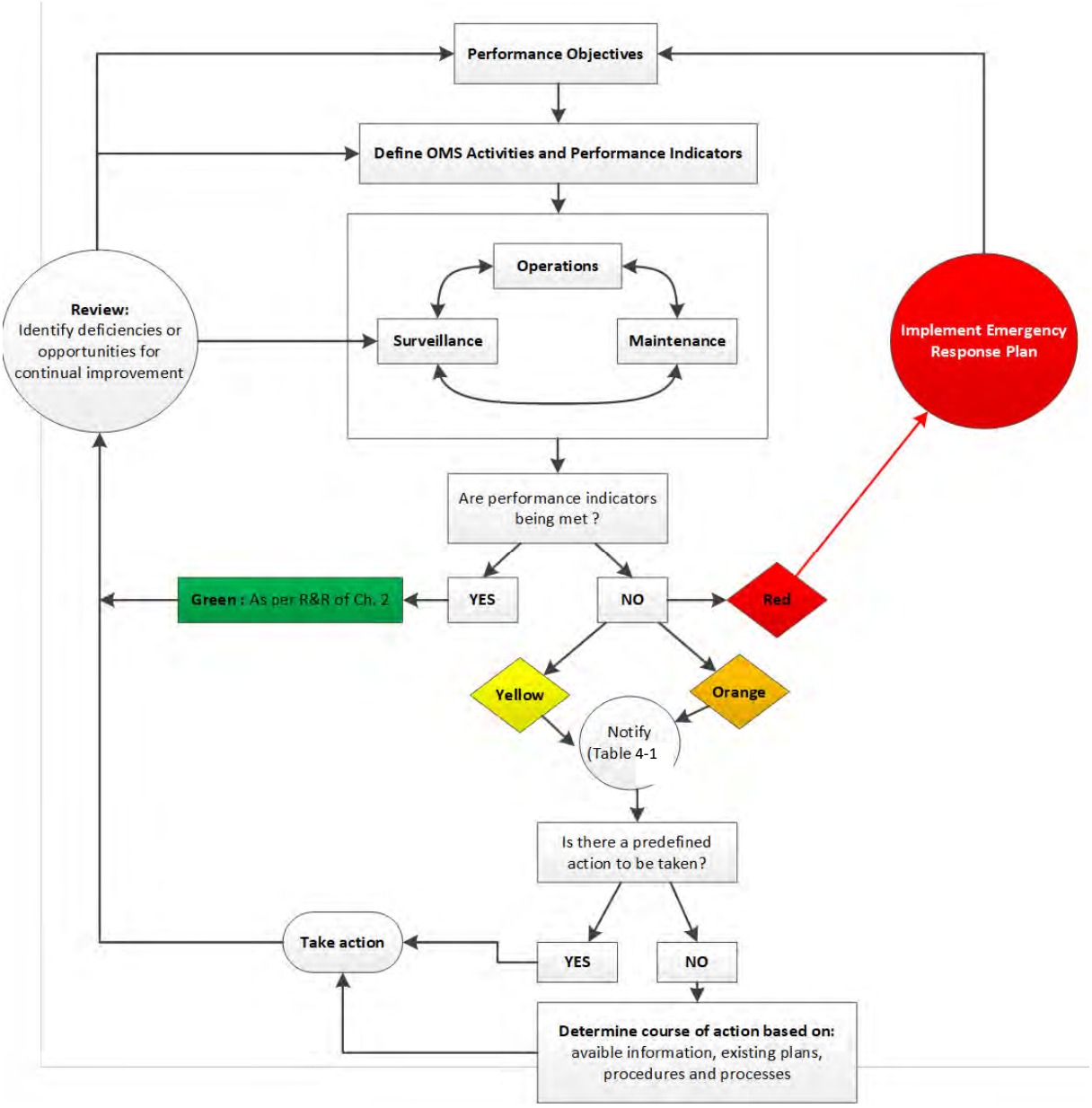


Figure 3-2: Communication and Decision Process for Water Management Infrastructure TARP

Table 3-3 : Communication Procedure to Change TARP Level

Category	Notify	Timeline	Method of Communication
Green	On-Site team → Responsible person → • Independent Review Board • Designer • General Manager • EOR • AEO	The trigger are back to green for more than 2 weeks	Phone Call and E-mail to inform on status change. RP and EOR must agree to change status Brief memo sent by e-mail to officialise TARP change

Category	Notify	Timeline	Method of Communication
Yellow	On-Site team → Responsible person → • EOR	Within 24 hours of the TARP level condition being met	Phone Call and E-mail to inform on status change. RP and EOR must agree to change status. If RP can't be joined the on-site team will try to contact these people in this order : Site Geotechnical Engineer, EOR, AEO
	Responsible person → • Independent Review Board • Designer • General Manager • EOR • Process Plant Superintendent	Within 72 hours of the TARP level change	Brief memo sent by e-mail to officialise TARP change Meeting to be set to explain situation if required
	EOR → • AEO	Within 1 week of TARP level change	Left to the EOR discretion
Orange	On-Site team → Responsible person → • EOR	Immediately upon discovering TARP level triggers change	Phone Call, E-mail and meeting to inform on status change. If RP can't be joined the on-site team will try to contact these people in this order : Site Geotechnical Engineer, EOR, AEO
	Responsible person → • Independent Review Board • Designer • General Manager • EOR • AEO • Health & Safety Superintendent • Process Plant Superintendent	Within 24 hours of the TARP level change	Brief memo sent by e-mail to officialise TARP change Meeting to be set to explain situation
RED	On-Site team → Emergencies Response Team Once an emergency is declared refer to the ERP. Emergency response is out of scope of this document	Immediately when the emergency is discovered. If there is currently a risk to Env or Health and Safety	Emergency – Emergency Emergency and road channel Or at Emergencies 911
		Immediately when the emergency is discovered. If there is imminent risk to Env or Health and Safety	Phone call to ERT coordinator (103) & Health and Safety Superintendent

3.4 North Dam and South Dam Operating Criteria

The operating criteria for the North Dam and South are defined by the Trigger Action Response Plan, and the Dam Monitoring Standard Operating Procedures.

North Dam Monitoring SOP	TIA OMS Manual Appendix H
North Dam Trigger Action Response Plan	TIA OMS Manual Appendix G, Table 1
South Dam Monitoring SOP	TIA OMS Manual Appendix H
South Dam Trigger Action Response Plan	TIA OMS Manual Appendix G, Table 2

Madrid North CWP Operating Criteria	Madrid North CWP OMS Manual

3.5 TIA Operating Criteria and Freeboard Requirements

3.5.1 TIA Water Reclaim Pond Operating Criteria and Thresholds

The operating criteria for the TIA water reclaim pond elevation is presented in Table 3-4 below. The water reclaim elevation criteria are also included in the Trigger Action Response Plan (Appendix G, Table 3).

The Hope Bay Water Management Plan. provides an overview of the site wide water management strategy.

Table 3-4 - TIA Water Reclaim Pond Operating Criteria and Thresholds

Structure	**Freeboard to crest (m)**		**Maximum tailings elevation (m)**	**Operation Water level (m)**		**Corrective Action Condition** **Max = Full Supply Level (m)**	**Critical Condition Level (m)**
	Tailings	**Water**		**Normal**	**Early Warning level (m)**		
North Dam	N/A	2.0	N/A	<31.5	31.5-32.5	32.5-33.5	>33.5
South Dam	1.5	N/A	33.5	N/A	N/A	N/A	N/A
TARP Level	N/A			Green	Yellow	Orange	Red
Response	N/A			Standard operations	Inform stakeholders (**Table 3-3**)	Immediately take action to stop increase. Inform stakeholders (**Table 3-3**)	Trigger ERP and DEP (Section 8)

3.5.2 North Dam and South Dam Freeboard Requirements

North Dam

The North Dam is operated as a water retaining dam with the parameters indicated below.

Component	Elevation (m)
crest elevation	37.5
top of frozen core and geosynthetic clay layer	35.3
full supply level	33.5
total freeboard	4.2
normal freeboard	2

Note: These freeboard numbers include a 1 m allowance for dam deformation (SRK 2015a). Total freeboard also includes required area to store a storm volume at least 1/3 between 1/1000 and the PMF (see Section 3.10).

South and West Dams

The South and West Dams are not water retaining structures with the parameters indicated below.

Component	Elevation (m)
crest elevation – Phase 1 (current elevation) crest elevation – Phase 2	38.0 44.5
top of geosynthetic clay liner – Phase 1 (current elevation) top of geosynthetic clay liner – Phase 2	36.5 45.0
full supply level	33.5
freeboard	1.5

Note: Tailings beaches along the upstream slope of these dams creates a final topography that free-drains towards the Reclaim Pond ensuring no water will pond adjacent to these structures. Tailings deposition discharges from points located near the dam crest. The tailings level at the South and West dam is designed to be above the full supply level (which is governed by the elevation of the North Dam).

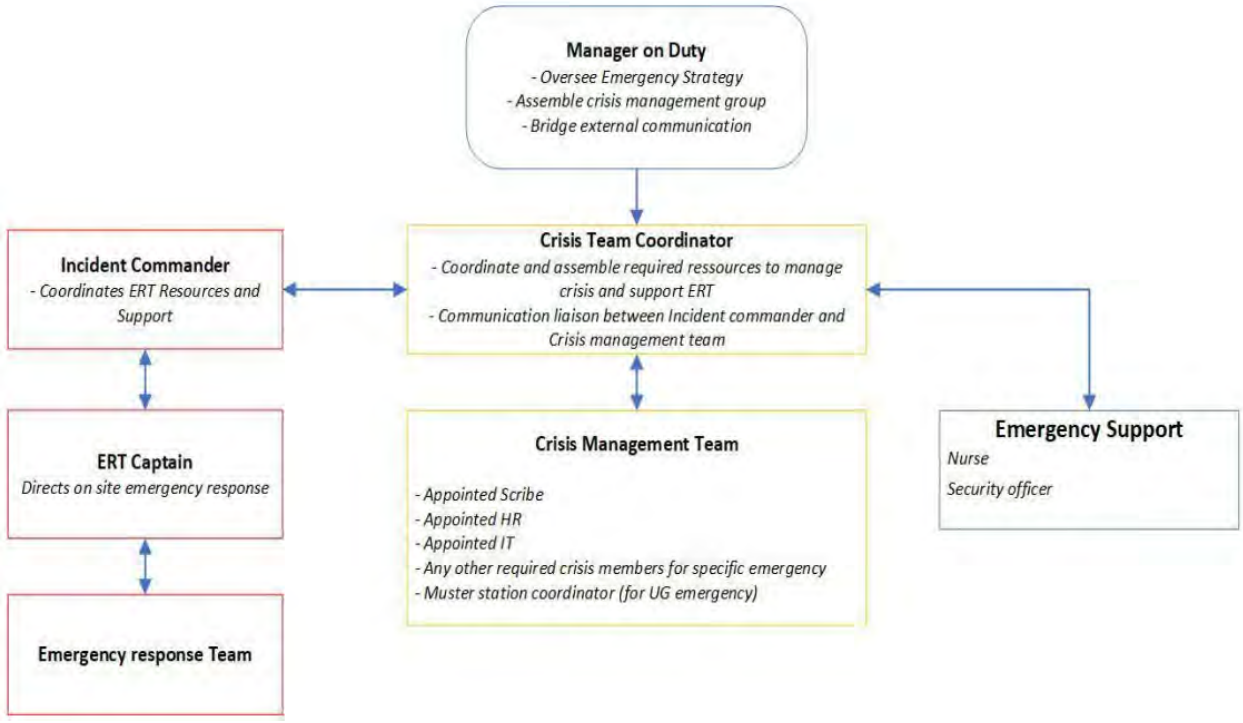
4 Emergency Response Structure and Roles

Response to dam related emergencies will use the same emergency response structure and crisis management as described in the Hope Bay Project Emergency Response Plan. Hope Bay crisis management is summarized in the subsections below. Additionally, roles and responsibilities outlined in Section 2 of the TIA OMS Manual also apply to dam related emergencies.

4.1 Crisis Management Team

The Crisis Management Team (CMT) is responsible for directing all work performed and managing all resources during an emergency incident. The CMT is typically formed by senior management or designates performing the various required functions to ensure the safety of all personnel involved. The CMT draws on resources from Safety, Operations, Technical Services, Environment and Maintenance personnel as necessary to complete emergency response tasks. The Structure of the CMT is outlined in Section Depending on the nature of the emergency, additional managers and personnel may be added to the CMT. For a detailed description of the roles and responsibilities of CMT members, refer to section 3 of the Hope Bay Emergency Response Plan.

4.1.1 Crisis Management Team Command Structure



4.1.2 Crisis Management Centre

Crisis management operations will be directed out of the Crisis Management Centre located at the Administration Board Room. Location will depend on the nature and circumstances of the emergency.

• Key decisions will be made, and operations will be managed.
• Technical information to direct emergency activities will be provided.
• A communications centre will be established for emergency operations and to communicate with other organizations.
• Resource procurement will be provided, and resource use will be directed.
• Information on the emergency will be logged for accuracy and disseminated to all necessary internal and external parties.

All responses and mitigation efforts developed at the Crisis Management Team will be implemented through the IC. In the event of an emergency, security personnel may be required to establish and maintain a security perimeter to prevent or minimize injury to personnel, to preserve evidence for investigation, or to prevent unauthorized access to the scene.

4.1.3 Emergency Response Contact Information

An accurate list of available responders will be kept updated as required and communicated to stakeholders.

ERT Roster May 25 to June 1, 2022

Active			
Room	D/N	Company	Name
B4	D	AEM	Sanderson, Jason
B32	D	AEM	Gentile, Evan
G13	D	KCMD	Stoddart, Jason
G7	D	KCMD	Andrews, Jamie
G17	D	KCMD	Levac, Leo
G10	D	KCMD	Misponas, Sheldon
B20	D	AEM	Mercer, Mervin
E1	D	AEM	Dunn, Sarah
B11	D	AEM	Britnell, Troy
B6	D	AEM	Hill, Jonathan
B8	D	AEM	Adlem-Qilluniq, Scott
C9	D	AEM	Trahan, Derek
B22	D	AEM	O'Neill, Ron
B15	D	AEM	Munyoro, Edwin

Total Active ERT On Site

AGNICO EAGLE HOPE BAY

14

© Captains ©			
Room	D/N	Company	Name
C9	D	AEM	Trahan, Derek
B4	D	AEM	Sanderson, Jason
	D		
	D		

Incident Command & Control On Site			
Room	D/N	Position	Name
C4	D	General Superintendent	Desrochers-Gagnon Philemon
C2	D	Health & Safety	Towle, Brad
E13	D	Enviro General Supervisor	Dufor, Guy
C3	D	Exploration Superintendent	Dix, Conrad

Medic On Site Radio Channel 6			
Room	D/N	Company	Name
C10	D	AEM	Hamlin, Vicky

ERT Coordinator			Radio channel 2
Room	D/N	Company	Name
B4	D	AEM	Sanderson, Jason

Security			Radio channel 2
Room	D	Company	Name
B4	D	AEM	Sanderson, Jason

Pandemic Coordinator			
			Tonia Ajjola

WILDLIFE RESPONSE TEAMS

Radio channel 1 for reporting dangerous sightings IE. Grizzly

Radio Channel 7 for reporting non threatening wildlife encounters

WRT Team #1			
Room	D/N	Company	Name
C9	D	AEM	Trahan, Derek
B4	D	AEM	ontVanderwinkle, Guillau

WRT Team spare			
Room	D/N	Company	Name

WRT Team #2			
Room	D/N	Company	Name
B4		AEM	Jason Sanderson
B32		AEM	Gentile, Evan

WILDLIFE RESPONSE TEAM LEAD*			Radio Channel 7
Room	D/N	Company	Name

Table 3.1: Emergency Response Contact Information Chart

Name	Position	Office Phone	Mobile Phone	E-Mail
Eric Steinmetzer	General Mine Manager	819.759.3555 x4600104	(819) 763-0187	eric.steinmetzer@agnicoeagle.com
Philemon Desrochers-Gagnon	General Superintendent	819.759.3555 x4600106	(819) 355-0815	philemon-desrochers@agnicoeagle.com
Emma Geist	Human Resources Superintendent	819.759.3555 x4600138	(819) 860-2898	emma.geist@agnicoeagle.com
Brad Towle	Health & Safety Superintendent	819.759.3555 x4600138	403-714-1350	brad.towle@agnicoeagle.com
Conrad Dix	Exploration Superintendent	819.759.3555 x4600126	(905) 975-6150	conrad.dix@agnicoeagle.com
Philippe Lapointe	Engineering Superintendent	819-759-3555 x4600106	(819) 860-2898	philippe.lapointe@agnicoeagle.com
Dan Izzard	Materials & Logistics Superintendent	819-759-3555 x4600154	(780) 245-4293	dan.izzard@agnicoeagle.com

Table 3.2: Hope Bay Phone Numbers

Health and Safety		
Medics	Vicky Hamelin / Todd MacDonald	4600105
Health & Safety Manager/Super	Brad Towle	4600138
ERT Coordinator		4600103/4600196
Medic's Room	After Hours ****EMERGENCY ONLY****	4600115
Trainer	Don Harvey / Jason Sanderson	4600110
Security Officer	Bob Fogarty / John Fitzgerald	4600165
Pandemic Counselor	Louis-Philippe Gélinas	4600174
Surface Operations		
General Manager	Eric Steinmetzer	4600104
Maintenance General Supervisor	Cody Kerr	4600131
Electrical/Inst. Supervisors		4600117
Site Services Supervisor	Derek Trahan / Nelson Bell	4600126
Powerhouse	Norm Bertholds / Scott Adlem-Qilluniq	4600127
Warehouse Superintendent	Dan Izzard	4600154
Warehouse Team Lead	Dave Thomas / Jerry Gill	4600172
Warehouse (General)		4600158
Logistics Coordinator	John Pruden / Kevin Rutter	4600134
Mechanical Lead Hand		4600140
Light Vehicle Shop		4600157
Electrical Shop		4600139
Plumber's Shop		4600109
Electrical Planner		4600177
Mobile Planner		4600186
Mobile Maintenance Supervisor		4600130
Projects		4600122
Human Resources Superintendent	Emma Geist	4600159
Human Resources	Amanda Markmeyer / Tasha Robichaud	4600160
WTP		4600143
Mine Dept.		
Manager of Mining		4600179
Agnico Shift Supervisors / Wicket		4600163
Chief Mine Engineer		4600125
Core Shack		4600148
Senior Mining Engineer	Jian Yong Chen	4600100
Mine Planning	Mike Tanasa	4600132
Surveyor	Mervin Mercer	4600129
Senior Geology	Chris Annan	4600128
Geology		4600161/4600164
Tech Services/Mining Superint.	Philemon Desrochers / Phil Lapointe	4600106
Exploration Logistics	P.-O. Lamontagne / Sheldon Cameron	4600124
Explo Superintendent & Coordinator	Conrad Dix / Guillaume Beaudoin	4600135
KCMD Superintendent	Rod Keats / Charlie Riley	4600113
KCMD Safety/Trainer	Jason Cole / Jason Stoddart	4600119
Mill		
Process Plant Superintendent		4600145
Assay Lab Supervisor		4600173
Mill Control Room		4600150
Mill Shifters & Training		4600152
Mill Metallurgy		4600153
Mill Refinery		4600188
Mill Process Control		4600169

IT		
IT Coordinator	Stephan Quessy	4600178
IT HelpDesk	Yaser Imtiaz / Ali Hasnain	4606717
	hb.it@agnicoeagle.com	
Enviro Dept.		
Enviro Superintendent / Gen Sup	Nancy Duquet-Harvey / Guy Dufour	4600102
Environment Coordinator	Guillaume Vandewinkel / Jamie Power	4600101
Environment Tech	William Nalley / Tyler Lausch	4600101
Waste Management	Rob Bond / Jason Silverwood	4600187
Site Contractors		
Kitikmeot Catering Manager	Mike Hollick / Allan Lingwood	4600107
Geotech Supervisors	Michel/James	4600108
Geotech UG Supervisors	Derwin/Glen	4600191
Geotech Health & Safety	Dan Pearson / Steven Pereira	4600114
Geotech Shop		4600170
Public Phones		
Outside Kitchen	Public #1	4600111
Outside Kitchen	Public #2	4600112
Camp	Public #3	4600120
Camp	Public #4	4600121
D Wing	Public #5	4600136
D Wing	Public #6	4600137
E Wing	Public #7	4600181
E Wing	Public #8	4600182
G Wing	Public #9	4600183
G Wing	Public #10	4600184
G Wing	Public #11	4600185

Table 3.3: External Emergency Phone Numbers

WSCC Accident Reporting Line (24 hours)	Use 1st	1-800-661-0792
WSCC General Mines Inspector		867-669-4412
WSCC General line (Yellowknife)		867-920-3888
WSCC General line (Iqaluit)		867-979-8500
Stanton Hospital (Emergency)		867-669-4100
Stanton 24-hour hot line		867-669-4115
Stanton Hospital (General Inquires)		867-669-4111
Cambridge Bay Health Center		867-983-4500
RCMP Cambridge Bay		867-983-0123 867-983-1111
RCMP Yellowknife		867-669-1111
RCMP Iqaluit		867-979-0123 867-979-1111
Nunavut Coroner's Office		867-975-7292 867-222-0393
Yellowknife Coroner's Office		867-920-8713
Adlair (Cambridge Bay)		867-983-2569 867-983-2247
Air Tindi		867-669-8218 (Ext. 8292)
Summit Air		867-669-9789 (Ext. 221)
Arctic Sunwest		867-873-4464
Great Slave Helicopters		867-873-2081
Nunavut Emergency Management "Medevac"		800-693-1666
Keewatin Air Medevac		1-867-9202400 1-867-920-2300

4.2 Governance and Individual Responsibilities

Agnico Eagle is committed to the protection of the public, the environment and its personnel. The company has developed a governance policy for its critical infrastructure to ensure their management in an appropriate and responsible manner (AEM 2020). The primary elements of the policy are:

- The development of specific roles with specific responsibilities;
- Regular and consistent reporting;
- Accountability at all levels, from operations to corporate;
- The use of Best Available Technology (BAT) and Best Applicable Practices (BAP); and
- The use of a risk-based approach to manage the risks associated with critical infrastructure

The persons responsible for operations, maintenance, surveillance, emergency preparedness, and emergency response along with the governance policy are listed below and in Appendix A, which also provides the site management structure.

Accountable Executive Officer (AEO)	As emphasized by MAC (2019), the accountability for decisions related to tailings management rests with the Owner's Board of Directors or Governance Level. The Board of Directors or Governance Level is expected to designate an Accountable Executive Officer (AEO) for tailings management. More specifically, the following responsibilities are assigned to the AEO: • Needs to be aware of key outcomes of water management risk assessment and of how these risks are being managed • Has accountability and responsibility for putting in place appropriate management structure • Assign responsibility and appropriate budgetary authority for tailings management • Define the personnel duties, responsibility and reporting relationships, supported by job description and organisational charts to implement the tailings management system through all stages in the facility life cycles Provide assurance to AEM and its Community of Interest that tailings are managed responsibly
Mine General Manager	• Identify the scope of work and budget requirement for all aspects of tailings management • Approve budget for operations, maintenance, and surveillance related activity • Establish an organisational structure with Roles and Responsibilities that meets the Governance Standard on Critical Infrastructure • Identify and retain a Responsible Person (RP)

	• Liaise with independent reviewer (IRB) as required
General Superintendents	Ensure the OMS responsibilities delegated to the departments they oversee are carried out as described in this section of the OMS Manual
Engineer of Record (EoR)	The function of EoR is to support AEM in ensuring that mine waste and water management infrastructure are designed and operated properly. The owner, in assuring that these facilities are safe, has the responsibility to identify and retain an EoR, who provides technical direction on behalf of the owner. Having an EoR for mine waste and water infrastructure is recognized as one of the best practices for responsible management of mine waste and water management facilities. In accordance with the AEM Governance Policy for Critical Infrastructure, the EoR is an employee of AEM. The EoR's responsibilities include: • Support and give technical advice to the RP and the AEO on geotechnical and operational challenges • Participate if possible, in Dam Safety Inspections and associated reports for tailings facilities that include retention structures/dams • Verify if the Tailings Impoundment Area (TIA), waste rock storage facility (WRSF), and Water Retaining Infrastructures are designed and are operating in accordance with the best standards in the industry and the AEM corporate standards • Verify if the waste and water management plans are developed and followed to ensure safety of the operation and the business; • Review and provide agreement on the procedural documents related to waste and water management (including OMS, ERP and TARP); • Be available for the Independent Review Board (IRB); • Participate in IRB meetings and assist the RP in their preparation if required; • Participate in the facility's risk assessments; • Be available to participate in dam safety reviews; • Identify other internal or external professionals (such as hydrogeologists, geologists, hydrologists, etc.) to provide their support when required; • Propose a schedule of site visits and required meetings during the course of the year.
Design Engineer (DE)	Engineer Responsible for the design and annual inspection of the facilites. At Hope Bay, the DE plays an important role in the management of critical infrastructure. • Advise on contemplated changes to the structure operation • Advise on structure performance and mitigation work as required • Present during independent review board meeting to provide input and context on the structure performance

Responsible Person	The Responsible Person(s) identifies the scope of work and budget requirements (subject to final approval) for all aspects of tailings management, including the Engineer of Record (EoR), and will delegate specific tasks and responsibilities for aspects of tailings management to qualified personnel." The RP is directly responsible for the management of critical infrastructure on a specific site with the objective of compliance with the Governance. The management of critical infrastructure includes design, construction, operation and closure. The RP may delegate specific tasks and responsibilities for aspects of tailings management to qualified personnel (MAC 2017). • Ensure the implementation and sustainability of the Governance model at the site level; • Management of critical infrastructure, as well as appurtenant structures that may affect the critical infrastructure; • The management of personnel, budget and external resources for the critical infrastructure (external resources include the Design Engineer (DE), Independent Review Board (IRB) and any other necessary consultants/contactors); • Close collaboration with the EoR and communication with the Design Engineer and Independent Review Board); • Preparation for, and coordination of, IRB meetings and site visits; • Preparation for, and coordination of, annual geotechnical inspections; • Responding to, and implementation of, the recommendations of the IRB; • Annual review and update of the OMS Manual in collaboration with the EoR; • Continued application of the requirements of the OMS; • In collaboration with the EoR, preparation of an annual report on the status of the critical infrastructure; • Management of all documents and data related to design, construction, operation, closure, surveillance and monitoring in a secure, accessible and permanent manner; • Revise and update the OMS Manual to reflect as-built conditions and any other changes. Review and update the OMS manual into Intelex. Maintain up to date distribution list of the OMS Manual
Site Geotechnical Engineer (EIT)	The Site Geotechnical Engineer (or EIT) is designated by the RP and is responsible for specific tasks and responsibilities for aspects of tailings management that are delegated by the RP. The Site Geotechnical Engineer works closely with the RP and EOR. At Hope Bay the responsibilities of the Site Geotechnical include: • Support the implementation and sustainability of the Governance model at the site level;

	• Management of critical infrastructure, as well as appurtenant structures that may affect the critical infrastructure; • Support the management of personnel, budget and external resources for the critical infrastructure (external resources include the Design Engineer (DE), Independent Review Board (IRB) and any other necessary consultants/contactors); • Close collaboration with the EoR and communication with the Design Engineer and Independent Review Board; • Preparation for, and coordination of, IRB meetings and site visits; • Preparation for, and coordination of, annual geotechnical inspections; • Responding to, and implementation of, the recommendations of the IRB; • Annual review and update of the OMS Manual in collaboration with the EoR and RP; • Continued application of the requirements of the OMS; • In collaboration with the EoR, preparation of an annual report on the status of the critical infrastructure; • Management of all documents and data related to design, construction, operation, closure, surveillance and monitoring in a secure, accessible and permanent manner; • Review, revise and update the OMS Manual to reflect as-built conditions and any other changes. Review and update the OMS manual into Intelex. Maintain up to date distribution list of the OMS Manual • Ensure that maintenance work (predictive, preventive and corrective) is identified and carried out on the earthwork and instrumentation system in collaboration with the Site Services Department • Ensure the surveillance of the structures as required in the OMS Manual (visual inspection and instrument monitoring) is carried out • Ensure the maintenance work (predictive, preventive and corrective) on the earthwork and instrumentation system is identified and performed • Ensure that the surveillance data is reviewed and analyzed to evaluate dike performance with respect to design parameters • Ensure surveillance of the structures is carried out as required in the OMS Manual (visual inspection and instrument monitoring)
Independent Review Board (IRB)	Independent Review Boards are a mechanism to obtain independent, expert commentary, advice, guidance and where appropriate, recommendations to assist owners/operators in identifying, understanding, and managing risks associated with TSF, WRSF, WSF, HLF and water-retaining infrastructures. The

	Independent Reviewer(s) does not have decision-making authority. Accountability and responsibility for decisions rests with AEM. • Review mine waste management strategy (including tailings and waste rock storage facilities); • Review water management infrastructure designs and performance (including water retaining infrastructures); • Review on-going construction works and monitoring data; • Comment on implementation progress of proposed mine waste management improvement measures; • Provide opinions and guidance to the operation on the physical integrity, safety, behavior, and performance of the confinement systems for mine waste and water retaining infrastructures; and • Comment on management systems, emergency preparedness and overall management approach of the different mine waste management facilities and water retaining infrastructures.
Process Operations Superintendent	The Process Plant Department is the owner of the process plant. They work in close collaboration with the other stakeholder to ensure the success of tailings management. The Process Plant Superintendent is in charge of the Process Plant and ensure that: • The Process Plant team as sufficient resource (qualified workforce, material, budget, training) to fulfill the OMS obligation defined in this manual • A structure is in place that define the R&R, qualification, training requirement and a staffing strategy to fulfill the obligation of the OMS Manual • The process plant operates and maintains the infrastructure required to produce and transport (i.e pump) the tailings to tailings impoundment area • The process plant tracks the parameters and characteristics of the tailings produced to ensure that targets are reached • The process plant operates the reclaim water system and tracks the water consumption to ensure that targets are reached • The process plant stops the transport of tailings if required in case of upset or emergency condition
Environment Superintendent	The Environment Department ensures compliance with Environment Regulation and the Water License and is the owner of the water & tailings management infrastructures outside of the process plant. They ensure reporting and liaison with the NIRB, NWB, NGO's and other government agencies. The Environment Superintendent is in charge of the Environment Department and ensure that:

- The Environment team has sufficient resources (qualified workforce, material, budget, training) to fulfill the OMS obligations defined in this manual
- A structure is in place that defines the R&R, qualification, training requirement and a staffing strategy to fulfill the obligation of the OMS Manual
- Environment review monitoring data for compliance with Water License and regulations and to determine dike performance with respect to design parameters
- Support the Site Geotechnical Engineer

Site Services Superintendent or designate

The Site Services Department has the workforce and equipment to manage road, electricity and dewatering at the Hope Bay Site. They fulfill the planning done in collaboration with the Environment team to ensure the fulfilment of the OMS requirement. The Maintenance Superintendent is in charge of the Site Services Department and ensure that:

- The Site Services team has sufficient resources (qualified workforce, material, budget, training) to fulfill the OMS obligation defined in this manual
- A structure is in place that defines the R&R, qualification, training requirement and a staffing strategy to fulfill the obligation of the OMS Manual
- Site Services maintain access to the structure and tailings management systems. This include making road repairs, controlling dust and managing snow and water.
- Site Services install, operate, maintain and monitor all the components of pumps and piping system associated with water management. They also perform operation, maintenance and surveillance work on the piping system. This work is planned in collaboration with the Environment Department.
- Update and maintain a list of operational pumping equipment
- Install, operate, maintain and monitor all the components of pumps and piping system associated with water management. They also perform operation, maintenance and surveillance work on the piping system.

The Site Services Department has the workforce and equipment to maintain mobile equipment and pumps. They fulfill maintenance of some of the mechanical equipment component of the dewatering dike as requested by the Site Services department. The Site Services Superintendent is in charge of the Site Services Department and ensure that:

- Ensure preventive, predictive and corrective maintenance is carried out regularly on pumping equipment related to water management as requested by Site Services

	• Keep records of maintenance performance on pumping equipment
Health and Safety Superintendent	The Health and Safety Department is responsible to update and manage the site wide emergency response plan. The Health and Safety Superintendent is in charge of the Health and Safety Department and ensure that: • The emergency response plan is updated and is aligned with the OMS manual • The trigger to raise an emergency defined in the OMS manual and the communication pathway to do so is understood and aligned with the ERP

4.3 Contact Information

Environment and Critical Infra VP / Accountable Executive Officer	Michel Julien |michel.julien@agnicoeagle.com 416-947-1212 x3738 514-244-5876
Engineer of Record (EoR) / Technical Specialist, Environmental Management	Thomas Lepine | thomas.lepine@agnicoeagle.com 418-473-8077
Design Engineer	John Kurylo | jkurylo@skr.com 604-235-8541
Site Geotechnical Engineer	Brennan Jay| brennan.jay@agnicoeagle.com 867-988-6882 x 4600122
Independent Review Board	Bill Horne | bill.horne61@gmail.com Henri Sangam | henri.sangam@geomino.com
Mine General Manager	Eric Steinmetzer | eric.steinmetzer@agnicoeagle.com 867-988-6882 x 4600104 819-763-0187
Lab & metallurgy Superintendent (currently inactive)	TBD 867-988-6882 x 4600101
General Superintendent - Mining	Philemon Desrochers-Gagnon | philemon.desrochers@agnicoeagle.com 867-988-6882 x4600106

	819-355-0815 Philippe Lapointe | philippe.lapointe@agnicoeagle.com 867-988-6882 x4600106 819-860-2898
Environment Superintendent (Responsible Person)	Nancy Duquet-Harvey | nancy.harvey@agnicoeagle.com 867-988-6882 x4600102 819-856-4385
Maintenance General Supervisor (Dewatering Superintendent)	Cody Kerr | cody.kerr@agnicoeagle.com 867-988-6882 x4600131
Health and Safety Superintendent	Jake Murdoch | jake.murdoch@agnicoeagle.com 867-988-6882 x4600123

4.4 Mutual Aid

Agnico Eagle Mines has a signed Mutual Aid Agreement with the following regional operations:

- Dominion Diamond Mines
- Diavik Diamond Mines
- De Beers Canada - Gahcho Kue
- Deton'Cho / Nuna JV (Giant Mine)
- Yellowknife Fire Department (YKFD)

Each mine recognizes that having Crisis and Emergency Response capability is essential in the event that extraordinary circumstances put human life, operational infrastructure or the environment in extreme danger.

Each operation also recognizes that, at times, the scale of an emergency or crisis may overwhelm their individual resources. It is both desirable and prudent to establish terms for a combined response should such circumstances arise.

4.4.1 Mutual Aid Contacts

Agnico Eagle Mines Limited (Meadowbank and Meliadine):

Call (819) 860-6258 or (819) 759-3555 ext. 6720 Meadowbank, or

Call (819) 759-3555 ext. 3911 Meliadine.

State that the call is a mutual aid request for the Mine Manager (or designate – Manager on Duty). Person will transfer the telephone call to the requested Mine Manager immediately and the ERT team will be paged, or the ERT Coordinators contacted.

Meadowbank ERT Coordinators are Richard Jackson and Philippe Beaudoin. Office phone number is (819) 7593555 ext. 6809

Meliadine ERT Coordinators are Dave Loder and Ken Ludwig. Office phone number is

(819) 759-3555 ext. 3906

Diavik Diamond Mines Inc.

Call (867) 669-6500 Ext. 5903. Phone number is monitored by Security Control 24 Hours a day.

State that the call is a mutual aid request for the Chief Operating Officer (or Duty Manager on the weekend). Security will transfer the call to the requested Manager. He or She will contact the ERT Advisor to coordinate the requested mutual aid.

DDMI ERT Advisors: Richard Kretzschmar and Dave Arthur (867) 669-6500 ext. 5462

Deton'Cho / Nuna JV (Giant Mine Reclamation Project):

Call (867) 669-3702 or Cell (867) 446-2387. Mine Manager Joe Heimbach

Call (867) 669-3722 or Cell (867) 445-2884. Safety Coordinator Randy Thompson

State that the call is for a mutual aid request for the Mine Manager.

Mine Manager is Doug Hayes. Office (867) 669-3715, Cell (867) 444-0355

ERT Coordinator is Steve Millar, Office (867) 669-3717, Cell (867) 445-5620

De Beers Canada – Gahcho Kué:

Call (416) 645-1695 Ext. 6699. Phone number is monitored by Security Control 24 Hours a day.

State that the call is a mutual aid request for the President/COO (or Manager on the weekend). Security will transfer the call to the requested Manager. Security will contact the ERT Advisor to coordinate the requested mutual aid.

Gahcho Kué ERT Advisors: John Gale and Richard Church (416) 645 1695 extension 6701

Dominion Diamond Mines:

Call (867) 880-2201 or (867) 880-4400. Both phone numbers are answered and monitored by Dominion Diamond Mines Security Control 24 hours a day.

State that the call is a mutual aid request for the Mine Manager (or designate on the weekend). Security will transfer the telephone call to the requested Mine Manager immediately and the ERT team will be paged, or the ERT Coordinators contacted.

Dominion Diamond Mines ERT Coordinators are David English and Nathan Pitre. Office phone number is (867) 880-2394.

Yellowknife Fire Department (YKFD):

YFFD would be utilized for backfilling the ERT for surface emergencies. This allows Ekati ERT members to focus on an underground incident or for emergency assistance on large surface emergencies.

Call the 867-873-2222 (Yellowknife Fire Department Dispatch) and request that the on-call command officer call the BRT Team leader for a mutual aid request. If a message is taken for relay (after hours) to the designated person, provide a telephone number that is guaranteed to be answered by the Operations Manager (IMT).

4.5 Emergency Response Equipment

The Incident Commander & Emergency Response Team members will be familiar with the emergency equipment and tools available and keep up to date of the status and location of emergency equipment.

Emergency Equipment and Tools			
Location	**Category**	**Unit**	**Quantity**
Mine Rescue Room	SCBA	Draeger Pss-5000	8
		4500 Psi Composite Cylinders	16
	CCBA	Draeger BG4	15
		Composite O2 Cylinder	30
		Draegersorb	500 lb.
		Ocenco	2
	Oxygen Therapy	Care vent	2
		BVM	1
	Rope Rescue	Static Rope 300 Ft	2
		MPD	3
		Carabiner	20
		Large Carabiner	2
		Prussic Long	4
		Prussic Short	4
		Break Rack Bar	2
		Single Pulley	6
		Double Pulley	6
		Figure 8	2
		Rope Grab	2
		Rescue Harness	2
	Gas Monitors	Draeger X-AM 5000	1
		Draeger Pac-7000	1
	Extrication Tools	Power Hawk Extrication Set Jaws Cutter Spreader Power Pusher Rams	 1 1 1 3
	First Aid	Stretcher Basket	2
		Backboard	2

Emergency Equipment and Tools			
Location	**Category**	**Unit**	**Quantity**
		Ferno Head Restraint	2
		First Aid Kits	8
		Arm Speed Splints	4
		Leg Speed Splints	2
		Blankets	9
	Confined Space	FAN8-12V Portable Ventilating Fan	1
		FAN-7004CL 25 Ft. Canister Duct	1
	Bunker Gear	Bunker Gear Set	12
	Nozzles	VIPER X 2 30 to 125 GPM	1
		ELKHART X 2 60 TO 150 GPM	1
		Fire Caddy 12 foam inductor	1
		Gated Y's 2 inch to 1.5 inch	3
		Gated Y's 2.5 inch to 2.5 inch	2
	Lay Flat Hose	lengths 2.5" rubber lined 50ft	11
		lengths 1.5" rubber lined 50ft	8
		lengths 1.5" fiber 50ft	2
	Ventilation Fans	Electric air pusher on wheels 110volt	1
		Electric air pusher carry only 110volt	1
		Gas powered air pusher on wheels	1
	Ice Water Rescue Gear	Ice water rescue suits	2
		100ft ice water rescue rope	1
		20ft ice water rescue throw rope	1
		Life jackets	10
		Ice rescue flotation rescue back board	1
	Confined space	Sked rescue body wraps	2
	First Aid	Trauma kits with oxygen	2
Fire Truck	CABINET 1	2.5" inch to 1.5" adaptors	3
		2.5" to 2.5" male female couplers	3
		2.5" to 2.5" female to female couplers	2
		2.5 female cam-lock to 2.5" threaded male adaptor	1
		4" female y to 2.5" male ends	1
		2.5" threaded to 2.5" male cam-lock	1

Emergency Equipment and Tools			
Location	**Category**	**Unit**	**Quantity**
		2.5" female to 1.5" female cam-lock	1
		6" female cam-lock to 4" male cam-lock adaptor	1
		4" female to 2.5" male cam-lock	1
		2.5" end cap cam-lock	1
		2.5" female gated y to 1.5" male ends	2
		Twist lock to a 2.5" threaded female end	1
		30-125 psi water flow 1.5" nozzles	3
		90-250 psi water flow 2.5" nozzle	1
		foam tube adapter to 1.5" nozzle	1
		2.5" hose wrenches	2
		1.5" foam educator	1
		Small pry bars	2
		Flashlight with spare battery	1
		Large pry bar on top cabinet	1
		1.5" hose wrenches on top of cabinet	2
	CABINET 2	1.5" ground mount 1.5" hose connection fan sprayer	1
		50FT 1.5" Fire hose	4
		10ft rubber lined 1.5" fire hose	1
		100ft 1.5" fire hose	1
		1.5" 20ft hard suction line with no connections	1
		Fire extinguishers	2
	CABINET 3	5 gallon can fuel	1
	TOP OF TRUCK	2.5" 50ft fire hose	1
		2.5" 100ft fire hose	1
		1.5" 50ft fire hose	1
		1.5" 100ft fire hose	1
	CROSS LAY	1.5" 100ft rubber fire hose	1
		1.5" 100ft fire hose	1
	CABINET 4	Toolbox	1
		Pail 2% foam	1

Emergency Equipment and Tools			
Location	**Category**	**Unit**	**Quantity**
	CABINET 5	2.5" 50ft fire hose	3
		Tank / drum plug kit	1
		bolt cutter	1
		3/4" foam hose	2
		2.5" hose wrenches	3
		Cleaning brush	1
	TOP	Large Halogen Bar	1
		Broom	1
		Large pry bar	1
		Hockey stick electrical	1
		Pick pole	1
	INSIDE CAB	PFD	3

4.6 Emergency Response Initiation and Communications

SECTION 2 - ACTIVATION OF AN EMERGENCY RESPONSE

Emergency response is activated following the activation of the Code 1 protocol. The protocol is triggered when an employee contacts the incident commander through the radio on Emergency Channel 1 and the Incident Commander acknowledges that this situation requires initiation of the Emergency Response Team. From there, ERT will be dispatched, and crisis management can be triggered if the situation requires it as per the incident commander's assessment.

SECTION 5 - COMMUNICATION SYSTEMS

The primary basis for communication will be the phone system; back-up communication will be available via satellite phones. For on-site communication, hand-held radios will be available for all employees working or travelling in remote areas from the main camp. Back-up power sources and replacement batteries for communication equipment will be available to provide continuous, uninterrupted operation either at fixed facilities or at emergency sites.

Key site personnel will be accessible at all times by either portable radios, radios in vehicles, or office radios. The Health Care Provider will carry a hand-held radio and will be available at all times. Designated personnel will monitor the emergency channel during day and night.

Lists of employees trained in first aid, mine rescue, and Emergency Response will also be posted.

5 Dam Emergency Scenarios

5.1 Dam Break or Uncontrolled Environmental Discharge – *Extreme Case*

An emergency or "Red" condition is defined as a situation where there is a credible threat to the health and safety or an uncontrollable discharge of tailings/contact water resulting in irreversible environmental impacts.

5.1.1 Breach of the North Dam

In the event of a breach of the North Dam. Access to the North Dam via Doris Bridge should be immediately restricted via **activation of the site wide ERP.**

Based on conservative dam breach scenarios, Doris bridge may be impacted by a dam breach event (Appendix B).

5.2 Potential Actions in the Event of a Dam Breach

If time permits, the following emergency remedial actions should be **considered**. Immediate implementation of these remedial actions may delay, moderate, or prevent the failure of the dam. Several of the listed adverse or unusual conditions may be apparent at the dam at the same time, requiring implementation of several modes of remedial actions. Close monitoring of the dam must be maintained to confirm the success of any remedial action taken at the dam. Time permitting, any remedial action should be developed through consultation with AEM's Engineer of Record.

Embankment Overtopping

1. If the water level in the reservoir is no longer rising, place sandbags along the low areas of the top of the dam to control wave action, reduce the likelihood of flow concentration during minor overtopping, and to safely direct more water through the spillway.

2. Cover the weak areas of the top of the dam and downstream slope with riprap, sandbags, plastic sheets, or other materials to provide erosion-resistant protection.

Seepage and Sinkholes

1. If the entrance to the seepage origination point is observed in the reservoir (possible whirlpool) and is accessible, attempt to reduce the flow by plugging the entrance with readily available materials such as cocomatting, bentonite, soil or rockfill, or plastic sheeting.

2. Cover the seepage exit area(s) with several feet of sand/gravel to hold fine-grained embankment or foundation materials in place. Alternatively, construct sandbag or other types of ring dikes around seepage exit areas to retain a pool of water, providing backpressure and reducing the erosive nature of the seepage.

3. Prevent vehicles and equipment from driving between the seepage exit points and the embankment to avoid potential loss from the collapse of an underground void.

Embankment Movement

1. Open outlet(s) and lower the reservoir to a safe level at a rate commensurate with the urgency and severity of the condition of the slide or slump. If piping is damaged or blocked, pumping or siphoning may be required.

2. Repair settlement of the crest by placing sandbags or earth and rockfill materials in the damaged area to restore freeboard.

3. Stabilize slides by placing a soil or rockfill buttress against the toe of the slide.

Earthquake

1. Immediately conduct a general overall visual inspection of the dam.

2. Perform a field survey to determine if there has been any settlement and movement of the dam embankment, spillway, and low-level outlet works.

3. Drain the reservoir, if required.

6 DEP Maintenance

6.1 Training

Personnel outlined in Section 4.1 and 4.2 should be trained in problem detection, problem evaluation and appropriate remedial (emergency and non-emergency) measures. This training is essential for

proper evaluation of developing situations at all levels of responsibility (initial evaluation is usually based on on-site observations).

Testing is an integral part of emergency preparedness, to ensure that both the documents and the training of involved parties are adequate. Tests can range from a limited pen and paper exercise to a full-scale simulation of an emergency and can include multiple failure scenarios. Revisions

The DEP should be reviewed on an annual basis and revised if any of the relevant contacts and/or roles and responsibilities have changed. A full update the DEP is expected to be conducted at minimum every 10 years for significant and high failure consequence classification dams. The responsible person or designate is responsible for updating the DEP.

The DEP document held by AEM is the master document. When revisions occur, the AEM will provide the updates to all the DEP document holders as required. The document holders are responsible for revising any outdated copy of the respective document(s) whenever revisions are received. Outdated documents shall be immediately destroyed to avoid any confusion with the revisions.

6.2 Testing

The Canadian Dam Association recommends DEP training for all dam personnel and testing the DEP through internal exercises and periodic review and/or exercise of the DEP. Periodic exercise may consist of a simple review by AEM and key personnel (i.e. emergency, principal, alternate contacts the dam owner's technical experts) or a more thorough exercise that could include external organizations such as the local emergency authorities and others with responsibilities listed in the DEP.

A tabletop exercise usually involves a facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario should be developed prior to the exercise. Once the scenario has been presented, the participants will discuss the responses and actions that they would take to address and resolve the scenario. The facilitator controls the discussion, ensuring realistic responses and developing the scenario throughout the exercise.

HOPE BAY MINE DAM EMERGENCY PLAN

HOPE BAY, NUNAVUT

Appendix A: CWP Hypothetical Dam Breach Study

srk consulting

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Vancouver, BC V6E 3X2

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F: +1.604.687.5532
vancouver@srk.com
www.srk.com

Memo

To:	File	**Client:**	TMAC Resources Inc
From:	David Moran	**Project No:**	1CT022.043
Reviewed:	Ryan Williams, John Kurylo, Mauricio Herrera	**Date:**	October 29, 2019
Subject:	Madrid North Contact Water Pond – Hypothetical Dam Breach		

1 Introduction

As part of the development at Madrid, a contact water pond (CWP) is required at the Madrid North site to intercept and manage contact water runoff from the Madrid North waste rock pile (WRP). The design of the CWP incorporates a run-of-quarry (ROQ) berm with a geomembrane liner on the upstream face to contain contact water. The CWP liner is anchored and sealed to bedrock at the toe of the berm's upstream slope. The berm was founded on exposed bedrock and areas of frozen overburden soil. Permafrost present within the berm foundation will be maintained due to the thermal protection of the berm fill. The CWP design is presented in SRK (2019).

The CWP is formed by a 200 m long embankment of maximum height 7.5 m. The CWP is located 250 m south of the proposed Madrid mine portal and associated facilities which prompted the need to evaluate a potential dam breach of the CWP. The pond is designed to be operated with a two-week residence time and pumped regularly to remove accumulating water. The pond has the capacity to retain a volume up to 12,200 m^3.

2 Dam Breach Model

The modelled scenario is for a worst-case hypothetical condition where the Probable Maximum Precipitation (PMP) event occurs while the CWP is partially full due to a pumping or water management failure. The 24-hr spring PMP was estimated to be 115 mm (SRK 2017). During this hypothetical event, it is assumed that the pond would overtop causing a hydraulic failure of the embankment and releasing the stored water and PMP volume.

To evaluate this dam breach scenario a HEC-RAS 2D model was developed to simulate downstream flow routing. Model input parameters are outlined in Table 2-1, and Figure 2-1 shows the inflow hydrograph used in the hydraulic model which was produced based on the release volume, time to peak and a typical unit hydrograph shape.

Table 2-1: Hydraulic Model Input Parameters

Parameter	Data	Reference
Topography	1 m DEM including SRK designed infrastructure	Generated for study
Manning's *n*	0.05 (Scattered brush, heavy weeds)	Chow, 1959
Breach Height	7.5 m (full embankment)	Measured
Breach Width	22.9 m[1]	VT & G, 1990
Time to Peak	0.05 hrs[1]	Froehlich, 1995a
Release Volume	15,900 m^3	SRK, 2017

Note 1: A suite of five parametric equations were used with the worst-case selected

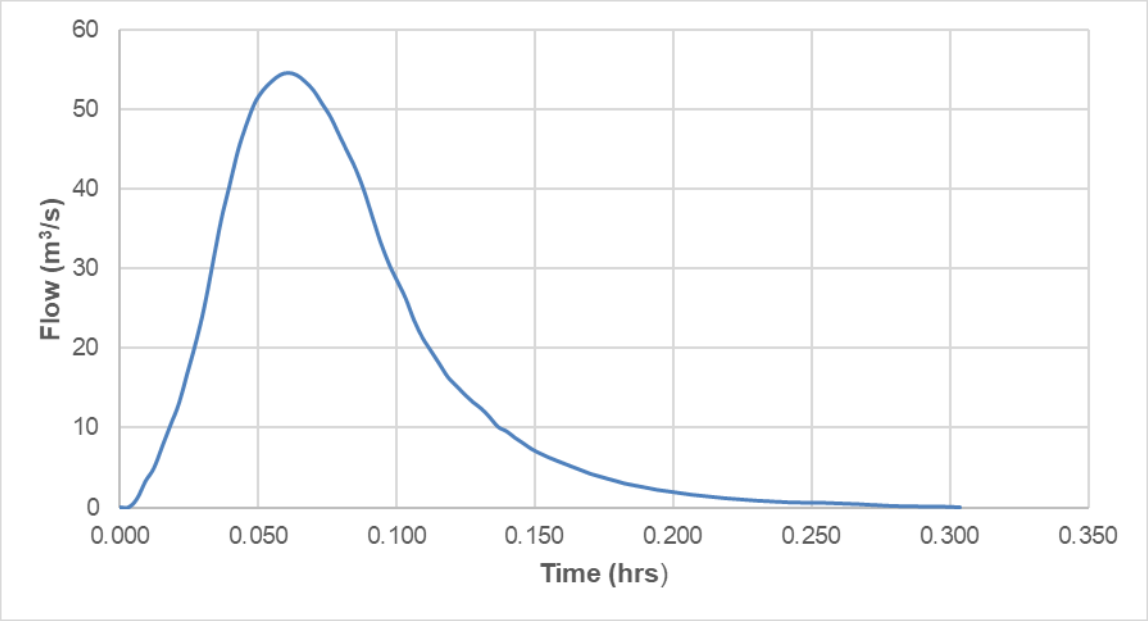

Figure 2-1: Dam Breach Hydrograph

3 Results

The results of the hydraulic model are presented in Maps 1, 2 and 3 (Appendix A). These figures show the peak arrival time, hazard classification and maximum water depth. The hazard classification map uses a combination of maximum depth and maximum velocity results to generate the risk classification in accordance with FEMA guidelines (FEMA, 2004).

The results show the potential for a flow path to the mine portal area. However, the risk to personnel, vehicles, and infrastructure by this flow is very low. Maximum flow depths in the location are less than 0.2 m. If this risk is deemed unacceptable a diversion berm would be an appropriate mitigation option. Further consideration would be required to determine the height, location and design of the diversion berm needed.

4 Summary

SRK has completed a hypothetical dam breach of the CWP in line with industry best practice standards. The analysis was completed for the conservative scenario assuming the pond is partially full, followed by the occurrence of a PMP event. The results of the analysis conclude:

- It is possible that a small amount of flow released from the CWP during a hypothetical breach would flow towards and reach the Madrid mine portal.
- The risk that flow poses to personnel, vehicles, and infrastructure in the portal area is very low, based on the hazard classification results.
- If TMAC prefer to eliminate the risk entirely of flow reaching the portal area, a small diversion berm would be required upstream of the proposed portal location.

5 References

Chow, Ven Te. 1959. Open Channel Hydraulics.

Federal Emergency Management Agency (FEMA), Federal Guidelines for Dam Safety, Hazard Potential Classification System for Dams, April 2004.

Froehlich, David C., 1995, “Embankment Dam Breach Parameters Revisited,” Water Resources Engineering, Proceedings of the 1995 ASCE Conference on Water Resources Engineering, San Antonio, Texas, August 14-18, 1995, p. 887-891.

SRK Consulting (Canada) Inc. 2017. Climate and Hydrological Parameters Summary Report, Hope Bay Project. November 2017.

SRK Consulting (Canada) Inc., 2019. Detailed Design of the Contact Water Pond Berm at Madrid North, Hope Bay Project. Report Prepared for TMAC Resources Inc., 1CT022.043. March 2019.

Von Thun, J. Lawrence, and David R. Gillette, 1990, Guidance on Breach Parameters, unpublished internal document, U.S. Bureau of Reclamation, Denver, Colorado, March 13, 1990, 17 p.

Appendix A – Model Results Maps

433200

433450

7550250

7550000

N

Portal Pads

Proposed Portal Location

Assumed Breach Location

Madrid North Waste Rock Pile Footprint

Contact Water Pond Berm

Madrid South All-Weather Road

LEGEND

Peak Arrival Time

(hours)

- < 0.1
- 0.1- 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 <

0 50 100

Meters

Notes:
1. Coordinate System: NAD 1983 UTM Zone 13N
2. Aerial Imagery Provided by TMAC (Dated 2007)

srk consulting

Project No: 1CT022.043

Filename: 1CT022.043.100_DamBreach_Fig01_rev03

TMAC RESOURCES

HOPE BAY PROJECT

Madrid CWP Hypothetical Dam Breach

Flood Wave Peak Arrival Time

Date:	Approved:	Figure:
Oct. 2019	RW	1

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433200

433450

7550250

7550000

Portal Pads

Proposed Portal Location

Assumed Breach Location

Madrid North Waste Rock Pile Footprint

Contact Water Pond Berm

Madrid South All-Weather Road

LEGEND

Hazard Classification

- Low
- Medium
- High
- Very High
- Extreme

0 50 100

Meters

Notes:
1. Coordinate System: NAD 1983 UTM Zone 13N
2. Aerial Imagery Provided by TMAC (Dated 2007)

srk consulting

Project No: 1CT022.043

Filename: 1CT022.043.100_DamBreach_Fig02_rev03

TMAC RESOURCES

HOPE BAY PROJECT

Madrid CWP Hypothetical Dam Breach

Flood Wave Hazard Classification

Date:	Approved:	Figure:
Oct. 2019	RW	2

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433200

433450

7550250

7550000

Portal Pads

Proposed Portal Location

Assumed Breach Location

Madrid North Waste Rock Pile Footprint

Contact Water Pond Berm

Madrid South All-Weather Road

LEGEND

Maximum Depth (m)

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 3
- 3 - 4

0 50 100

Meters

Notes:
1. Coordinate System: NAD 1983 UTM Zone 13N
2. Aerial Imagery Provided by TMAC (Dated 2007)

srk consulting

Project No: 1CT022.043

Filename: 1CT022.043.100_DamBreach_Fig03_rev01

TMAC RESOURCES

HOPE BAY PROJECT

Madrid CWP Hypothetical Dam Breach

Flood Wave Maximum Depth

Date:	Approved:	Figure:
Oct. 2019	RW	3

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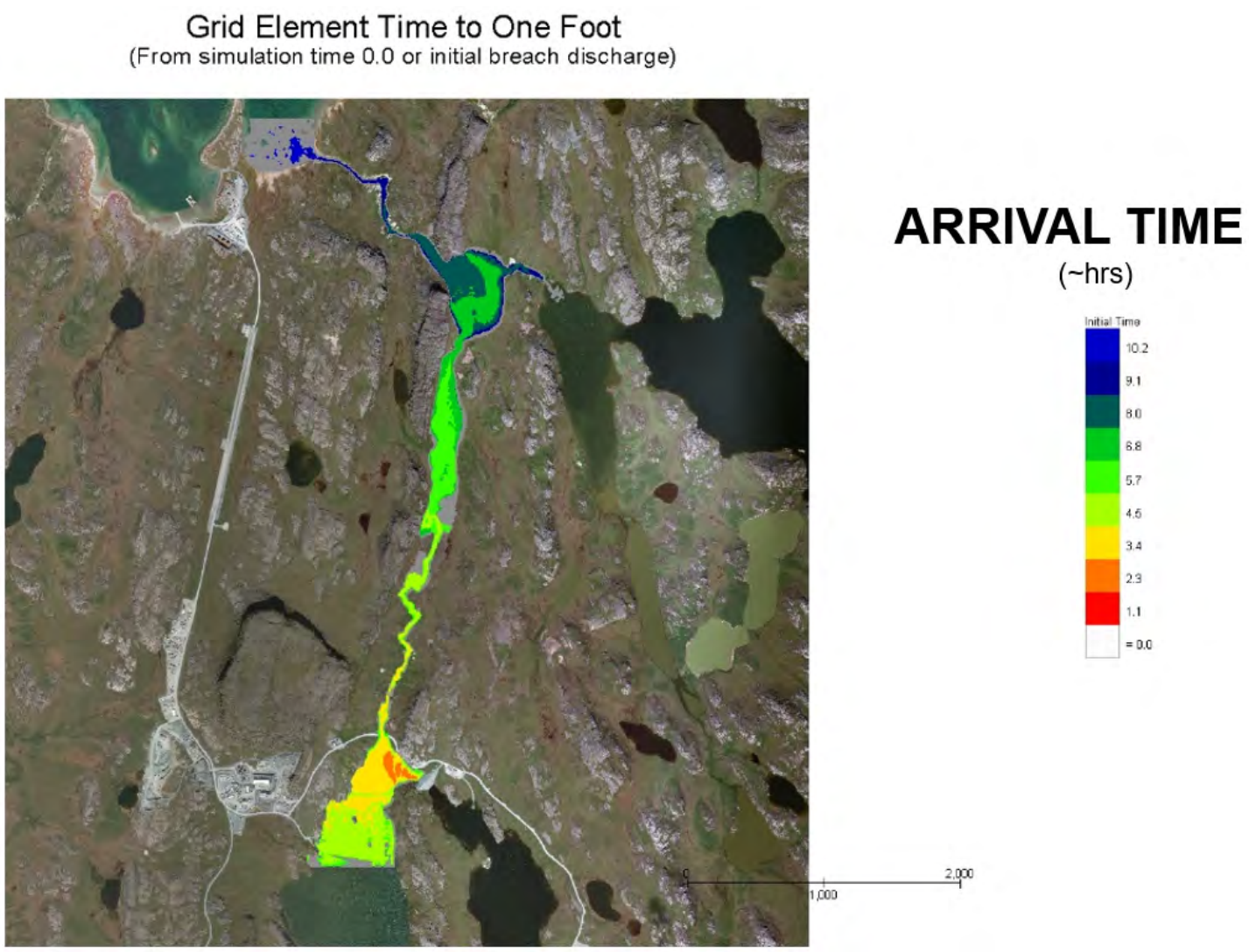
HOPE BAY MINE DAM EMERGENCY PLAN

HOPE BAY, NUNAVUT

Appendix B: North Dam Inundation Maps


Grid Element Time to One Foot
(From simulation time 0.0 or initial breach discharge)
ARRIVAL TIME
(~hrs)
Initial Time
10.2
9.1
8.0
6.8
5.7
4.6
3.4
2.3
1.1
= 0.0
0
1,000
2,000

Grid Element Flow Depth (3600 sec.) [1:0:0]

~ 60 mins

AGNICO EAGLE

OPERATIONS, MAINTENANCE AND SURVEILLANCE MANUAL: HOPE BAY DORIS TAILINGS IMPOUNDMENT AREA

HOPE BAY, NUNAVUT

Appendix G – Trigger Action Response Plan (TARP)

Hope Bay TIA - Draft TARPs Rev_6
9-Dec-22

Table of Contents

Trigger Level	Condition	Definition
Green	Normal Operating Condition	Maintain normal operating procedures.
Yellow - Level 1	Early Warning Condition	Areas of concern identified - Requires further investigation to determine **requirements for increased monitoring**
Orange - Level 2	Corrective Action Condition	High Risk Situation - Requires mitigation actions or operational controls to prevent an emergency situation from developing. **Implement Level 2 Actions.**
Red - Level 3	Critical Condition	Emergency Situation - Immediate threat to health and safety or environment that is uncontrollable through operational controls or mitigation actions. **Implement the site wide Emergency Response Plan and/or Dam Emergency Plan**

Procedure for changing trigger levels:
Refer to the TARP Notification Procedure tab for the decision making process and notification procedure that lists key personnel to be contacted when there is a change in trigger level.

North Dam

Dam Safety Criteria/Parameter	Observation/Monitoring Method	Operational Trigger Level Criteria			
		Green **Normal Operating Condition**	**Yellow** **Areas of Concern**	**Orange** **High Risk Situation**	**Red** **Emergency Situation**
Deformation or Displacement	Inclinometer	Within typical maximum of past 24 months	Displacement of 0.1 m per month over two survey periods (0.2 m) or greater than 0.5m total, with a credible trend.	Displacement of 0.15 m per month over four survey periods (0.6m) or greater than 0.5 m total, or if strain is greater than 10% in any area, with a credible and continuous or accelerating trend. 3 or more surrounding instruments must support this.	Displacements of over 0.8 m. Must be supported by visual observations of displacement/deformation.
	Suvey Monitoring Points (SSP, CSP, DSP)	Total displacement within typical maximum range of past 24 months	Vertical, horizontal or total displacement of 0.1 m per month over two survey periods (0.2 m) or greater than 0.5 m total, with a credible trend that is supported 3 or more surrounding instruments.	Vertical, horizontal or total displacement of 0.15 m per month over four survey periods (4 months) or greater than 0.5 m total, with a credible and continuous or accelerating trend. 3 or more surrounding instruments must support this.	Displacements of over 0.8 m. Must be supported by visual observations of displacement/deformation. Measurements from SSPs must be supported by measurements from other suvey points or inclinometers.
Cracking	Visual Inspection	None	New and expanding observed cracking, >= 5 cm wide, >= 10 m long, and deeper than 5 cm.	Expanding cracking 5 - 15 cm wide, 50 m long, deeper than 15cm but not in a clear orientation that would suggest a failure mechanism (semicircular, perpendicular or parallel to crest) but potential to propagate. Multiple aligned smaller cracks could be considered one larger crack.	**Evidence of clear imminent failure**, large cracking > 50 m long, > 30 cm deep, extending across or through the crest of the dam.
Depressions, settlement, erosion		None	Newly observed displacement, typically associated with cracking, (10-20 cm deep or 10-20 m2 in area)	New or progressing displacement observed (greater than 20 cm deep or greater than 20 m2 in area)	**Evidence of clear immentint failure**, progression of previously observed displacement (greater than 50 cm deep or greater than 20 m2 in area, expanded since previous inspection or supported by similar trends in nearby instrumentation)
Bulging/Sloughing/Discplacment at toe		None	Bulging at toe, parallel to dam centreline	Large bulge (> 50 m long) with excess water at toe, parallel to dam centreline, continuous over a significant portion of the dam, accompanied by tension cracking in the slope. Must be confirmed by instrumentation readings suggesting foundation thaw or active layer progression.	Similar observations as the orange trigger but must be accompanied by visual observations of cracking and settlement, with progressively worsening conditions with **evidence of clear imminent failure.**
Seepage (water quality downstream of toe)	Visual Inspection/Seepage Sampling/Lab Results	No seepage indicated by water quality results.	Seepage or ponding at the toe during otherwise site conditions. Must be confirmed by water quality results.	Turbid seepage or an increase in seepage at the toe during otherwise dry site condtions. Must be confirmed by water quality results.	Uncontrollable seepage toe, notably higher flow rate than in past seasons (typically a small stream of water during freshet) with high TSS (visibly sediment laden) and a tailings signature confirmed by water quality results.
Critical Zone - Core Temperature	GTC	Temperatures colder than -2°C	Temperature exceeding -2°C , for multiple beads showing a credible warming trend. Check list of excluded beads.	Temperature exceeding 0°C, for multiple beads with a rapid warming trend. (suggesting flowing water in contact with the sensors)	Temperatures exceeding orange criteria for a prolonged period within the critical zones, with a warming trend identified in multiple sensors, accompanied by data from other instruments and observations that show **evidence of clear immenint failure.**
Critical Zone - Foundation Temperature		Temperatures colder than -8°C	Temperature exceeding design criteria of -8°C , for multiple beads with a credible trend. Check list of excluded beads.	Temperature exceeding -2°C, for multiple beads with a rapid warming trend. (suggesting flowing water in contact with the sensors)	
Non-Critical Zone - Foundation Temperature			Warming trend that persists for more than 3 months, that exceeds typical seasonal trends of the past 2 years and exceeds temperatures predicted by thermal modelling. Check list of excluded beads.	Temperature exceeding 0°C, for multiple beads with a rapid warming trend that persists for more than 3 months, with potential to impact critical zone temperatures.	

Excluded Beads (excluded from the rest of the trigger levels and are monitored independantly.)	Below typical maximum of past 24 months	Warming trend that persists for more than 3 months, that exceeds typical seasonal trends of the past 2 years and exceeds temperatures predicted by thermal modelling.	Temperature exceeding 0°C, for multiple beads with a rapid warming trend that persists for more than 3 months, with potential to impact critical zone temperatures.	N/A
Initial Actions:	• Continue operation, maintenance, surveillance and monitoring as per standard operating procedure	• Notify required personnel per the Notification Procedure • Document location, photograph, survey, and inscrease inspection or monitoring frequency as appropriate • Conduct engineering review to assess further risk and determine next steps	• Notify required personnel per the Notification Procedure • Continue procedures established for Yellow conditions • Conduct engineering review to assess further risk and determine remedial/mitigative actions to be taken • Reassess thresholds and conditions for Red (Emergency) Level, taking into account current observations and conditions	• Implement the Hope Bay Project Emergency Response Plan • Consult Hope Bay Dam Emergency Plan • Notify personnel working downstream of the dam • Restrict Access to Doris Bridge andTail Lake Road • Restrict Access to the Dam Crest

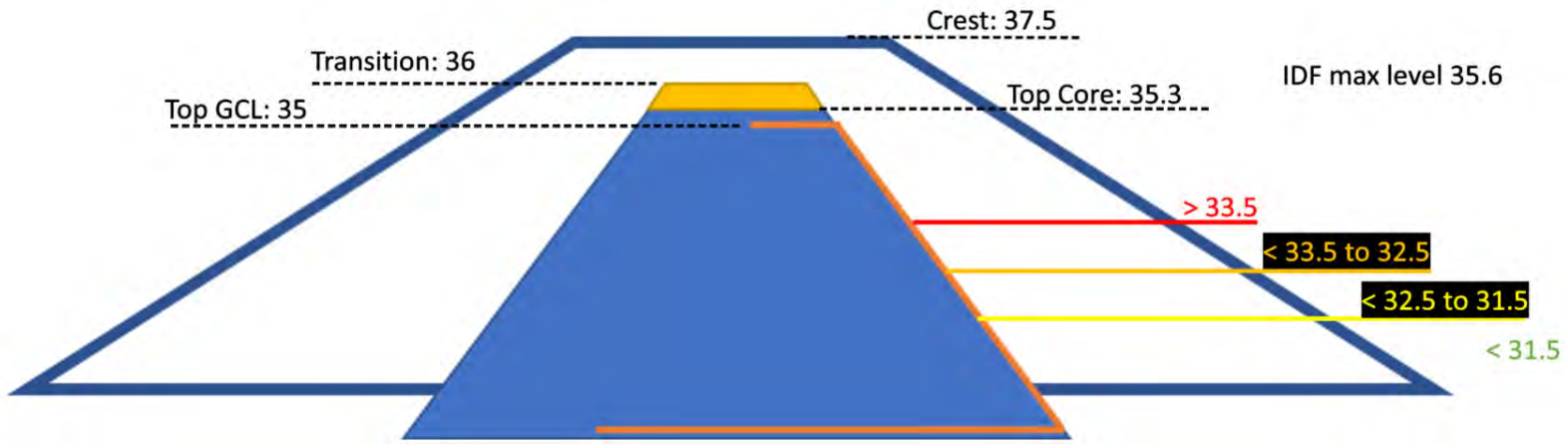
South Dam

Dam Safety Criteria/Parameter	Observation/Monitoring Method	Operational Trigger Level Criteria			
		Green **Normal Operating Condition**	**Yellow** **Areas of Concern**	**Orange** **High Risk Situation**	**Red** **Emergency Situation**
Deformation or Displacement	Suvey Monitoring Points (SSP, CSP, DSP)	Total displacement within typical maximum range of past 24 months	Displacement of 0.1 m per month over two survey periods (0.2 m) or greater than 0.5 m total, with a credible trend. Measurements from SSPs must be supported by measurements from CSPs or DSPs.	Displacement of 0.15 m per month over four survey periods (0.6m) or greater than 1.0 m total, or if strain is greater than 10% in any area, with a credible and continuous or accelerating trend. 3 or more surrounding instruments must support this. Measurements from SSPs must be supported by measurements from CSPs or DSPs.	Displacements of greater than 1.5 m. Must be supported by visual observations of displacement/deformation. Measurements from SSPs must be supported by measurements from CSPs or DSPs.
Cracking	Visual Inspection	New or exisitng small cracks < 5 cm wide, < 10 m long, and shallower than 5 cm.	Newly observed or expanding cracking, > 5 cm wide, > 10 m long, and deeper than 5 cm.	New or expanding cracking > 15 - 30 cm across, > 50 m long, deeper than 15cm but not in a clear orientation that would suggest a failure mechanism (semicircular, perpendicular or parallel to crest) but potential to propagate. Multiple aligned smaller cracks could be considered one larger crack.	**Evidence of clear imminent failure,** large cracking > 100 m long, > 0.5 m deep, extending across or through the crest of the dam.
Depressions, settlement, erosion		Seasonal movement confined to the downstream slope and toe areas that can be clearly associated with the permafrost active layer.	Newly observed displacement, typically associated with cracking, (20-40 cm deep or 20-40 m2 in area)	New or progressing displacement observed (greater than 40 cm deep or greater than 40 m2 in area)	**Evidence of clear imminent failure,** progression of previously observed displacement with evidence of migartion of tailings. Displacements greater than 100 cm deep or greater than 40 m2 in area, expanded since previous inspection or supported by similar trends in nearby instrumentation.
Bulging/Sloughing/Discplacment at toe		Seasonal movement that can be clearly associated with the permafrost active layer.	Bulging at toe, parallel to dam centreline	Large bulge (> 50 m long) with excess water at toe, parallel to dam centreline, continuous over a significant portion of the dam, accompanied by tension cracking in the slope. Must be confirmed by instrumentation readings suggesting foundation thaw or active layer progression.	Similar observations as the orange trigger but must be accompanied by visual observations of cracking and settlement, with progressively worsening conditions with **evidence of clear imminent failure.**
Ponded water at downstream toe of dam	Visual Inspection/Seepage sampling	Small ponds < 10 m in length and < 20 m in depth near the downstream toe of dam	Ponded water against toe of dam > 10 m in length and > 0.2 m in depth.	Continuous ponded water against toe of dam approx 100m long with depth > 0.5 m, with flow of water downstream with an identifiable tailings signature	Uncontrolled accumulation of water against toe of dam or any water with tailings signature downstream of the dam with **evidence of clear imminent failure.**
Critical Zone - Foundation Temperature	GTC	Temperatures colder than -2°C	Temperature exceeding -2°C , for multiple beads showing a credible warming trend. Check list of excluded beads.	Temperature exceeding 0°C, for multiple beads with a rapid warming trend. (suggesting flowing water in contact with the sensors)	Temperatures exceeding orange criteria for a prolonged period within the critical zones, with a warming trend identified in multiple sensors, accompanied by data from other instruments and observations that show evidence of **clear imminent failure.**
Non-Critical Zone - Foundation Temperature Upstream and Downstream		Below typical maximum of past 24 months	Warming trend that persists for more than 3 months, that exceeds typical seasonal trends of the past 2 years and exceeds temperatures predicted by thermal modelling. Check list of excluded beads.	Temperature exceeding 0°C, for multiple beads with a rapid warming trend that persists for more than 3 months, with potential to impact critical zone temperatures.	N/A
Non-Critical Zone - Key Trench Temperature		Below typical maximum of past 24 months	Warming trend that persists for more than 3 months, that exceeds typical seasonal trends of the past 2 years and exceeds temperatures predicted by thermal modelling. Check list of excluded beads.	Temperature exceeding 0°C, for multiple beads with a rapid warming trend that persists for more than 3 months, with potential to impact critical zone temperatures.	
Excluded Beads (excluded from the rest of the trigger levels and are monitored independantly.)					
Upstream Tailings Temperature		Cooling trend showing tailings freezeback in accordance with design/performance criteria	Need to set after instrument installs	Need to set after instrument installs	N/A
Tailings beach length	Visual Inspection	Beach length 100 - 80 m	Beach length < 80 m	Water against dam	N/A
Initial Actions:		• Continue operation, maintenance, surveillance and monitoring as per standard operating procedure	• Notify required personnel per the Notification Procedure • Document location, photograph, survey, and inscrease inspection or monitoring frequency as appropriate • Conduct engineering review to assess further risk and determine next steps	• Notify required personnel per the Notification Procedure • Continue procedures established for Yellow conditions • Conduct engineering review to assess further risk and determine remedial/mitigative actions to be taken • Reassess thresholds and conditions for Red (Emergency) Level, taking into account current observations and conditions	• Implement the Hope Bay Project Emergency Response Plan • Consult Hope Bay Dam Emergency Plan • Notify personnel working downstream of the dam • Restrict Access to the Dam Crest

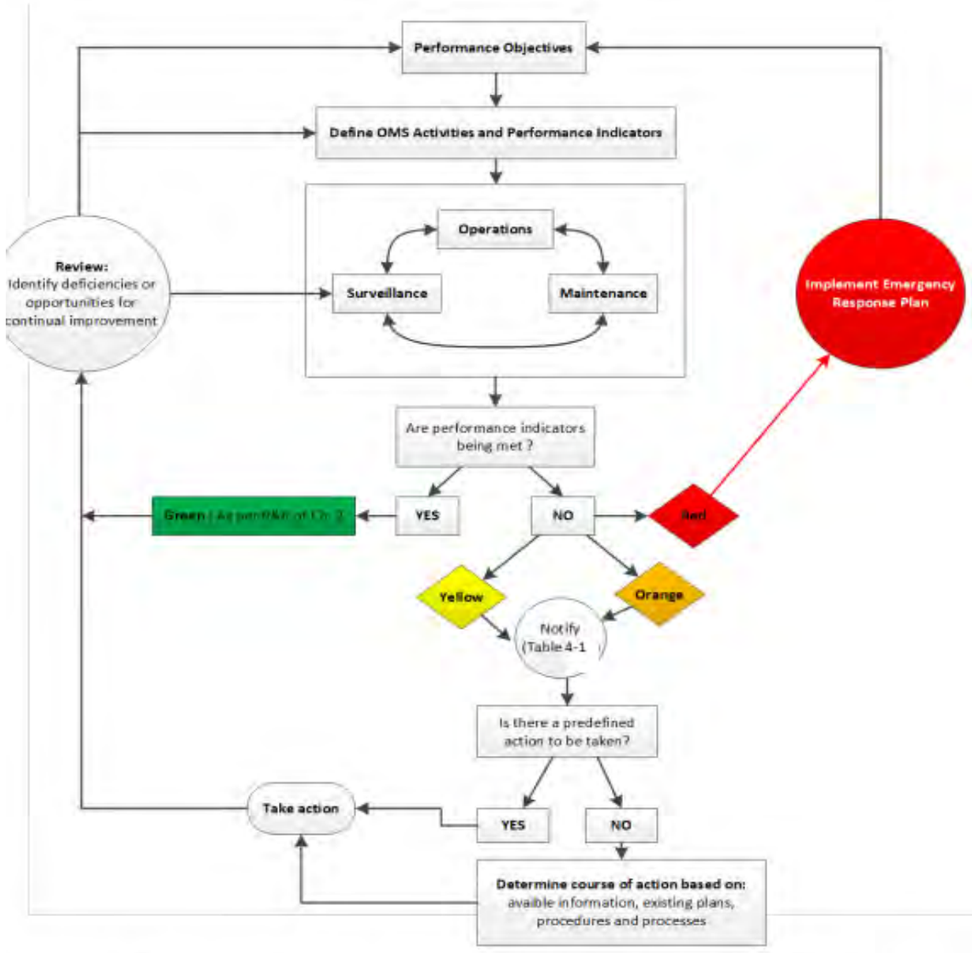
Water Elevation

Structure	Freeboard to crest (m)		Maximum tailings elevation (m)	Operational Water Level (m)		High Risk Condition (m)	Emergency Condition (m)
	Tailings	Water		Normal	Early Warning Condition		
North Dam		2.0	N/A	< 31.5	31.5 - 32.5	32.5 - 33.5	> 33.5
South Dam	1.5	N/A	33.5	-	-	-	-
TARP Level	-			Green	Yellow	Orange	Red
Response	-			Standard operations	Increased monitoring	Take action to stop increase	Implement ERP/DEP

Notes for discussion:
Need to update levels based on AEM approach to TARPs (Red = implement ERP). Should consider spillway invert elevation (to be constructed) before updating TARPs.



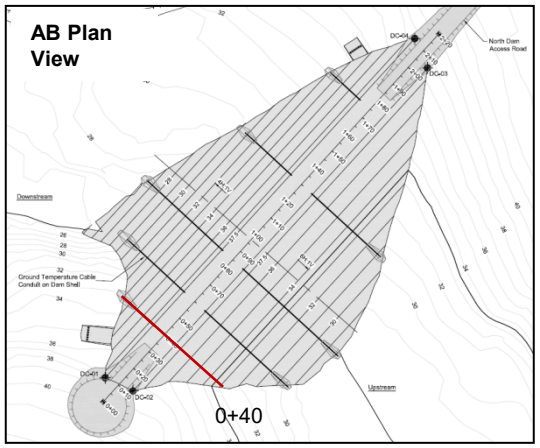
Notification Procedure



igure 4-1: Communication and Decision Process for Water Management Infrastructure TARP

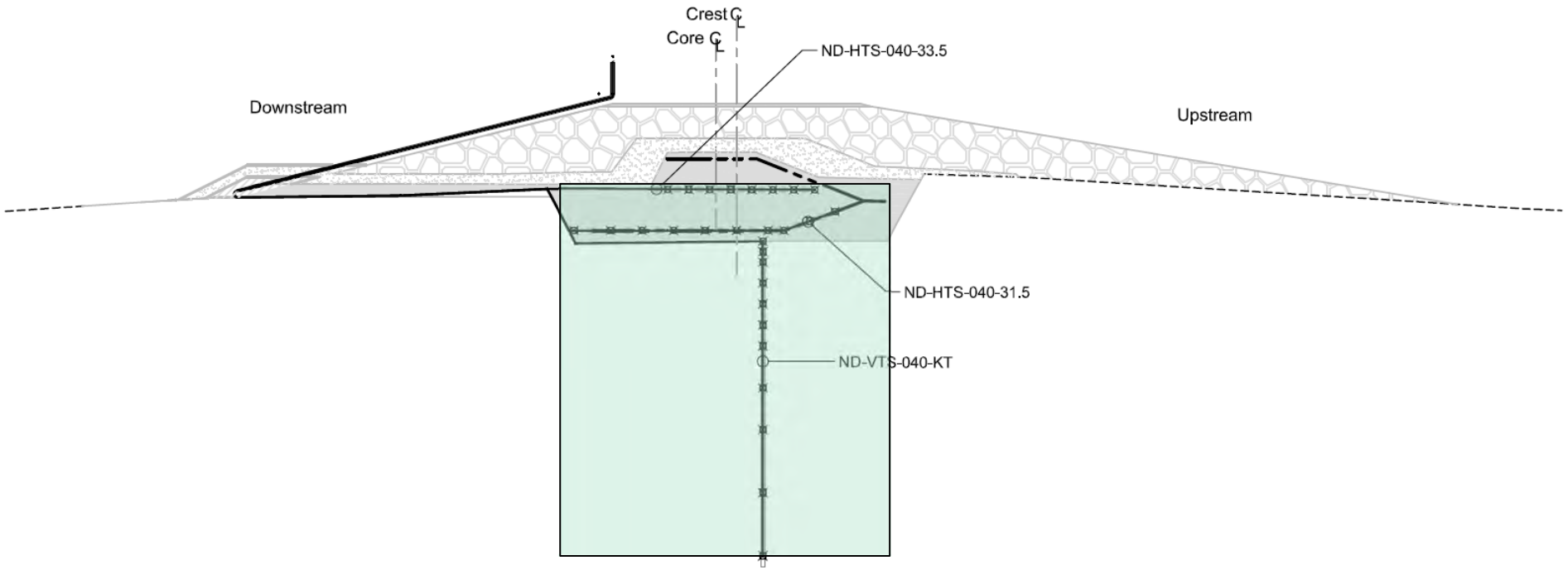
Table 4-1 : Communication Procedure to Change TARP Level

Category	Notify	Timeline	Method of Communication
Green	On-Site team → Responsible person → • Independent Review Board • Designer • General Manager • EOR • AEO	The trigger are back to green for more than 2 weeks	Phone Call and E-mail to inform on status change. RP and EOR must agree to change status Brief memo sent by e-mail to officialise TARP change
Yellow	On-Site team → Responsible person → • EOR	Within 24 hours of the TARP level condition being met	Phone Call and E-mail to inform on status change. RP and EOR must agree to change status. If RP can't be joined the on-site team will try to contact these people in this order : Water & Tailings GS, EOR, AEO
	Responsible person → • Independent Review Board • Designer • General Manager • EOR • Process Plant Superintendent	Within 72 hours of the TARP level change	Brief memo sent by e-mail to officialise TARP change Meeting to be set to explain situation if required
	EOR → • AEO	Within 1 week of TARP level change	Left to the EOR discretion
Orange	On-Site team → Responsible person → • EOR	Immediately upon discovering TARP level triggers change	Phone Call, E-mail and meeting to inform on status change. If RP can't be joined the on-site team will try to contact these people in this order : Water & Tailings GS, EOR, AEO
	Responsible person → • Independent Review Board • Designer • General Manager • EOR • AEO • Health & Safety Superintendent • Process Plant Superintendent	Within 24 hours of the TARP level change	Brief memo sent by e-mail to officialise TARP change Meeting to be set to explain situation
RED	On-Site team → Emergencies Response Team Once an emergency is declared refer to the ERP. Emergency response is out of scope of this document	Immediately when the emergency is discovered. If there is currently a risk to Env or Health and Safety	Emergency – Emergency Emergency and road channel Or at Emergencies 911
		Immediately when the emergency is discovered. If there is imminent risk to Env or Health and Safety	Phone call to ERT coordinator (103) & Health and Safety Superintendent



Legend:

- GTC Status: Cable irreparably damaged [Excluded]
- GTC Status: Bead damaged or data missing [Excluded]
- Critical Zone
- Excluded Beads



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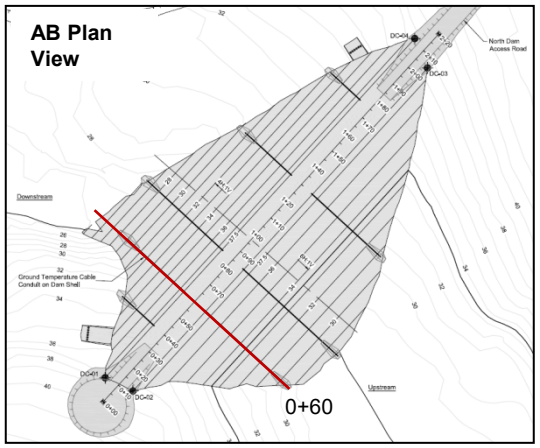

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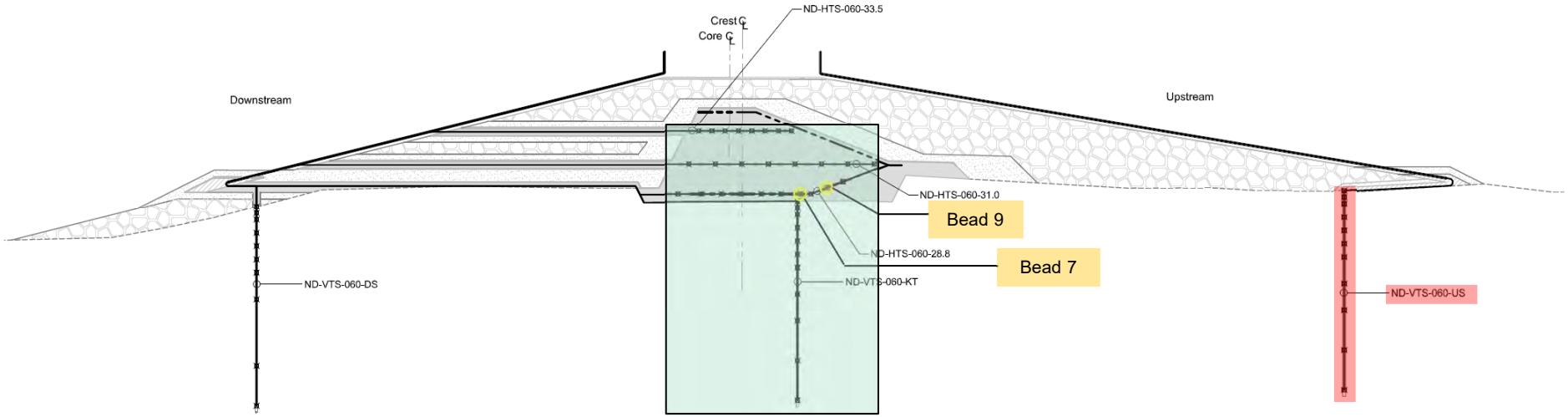

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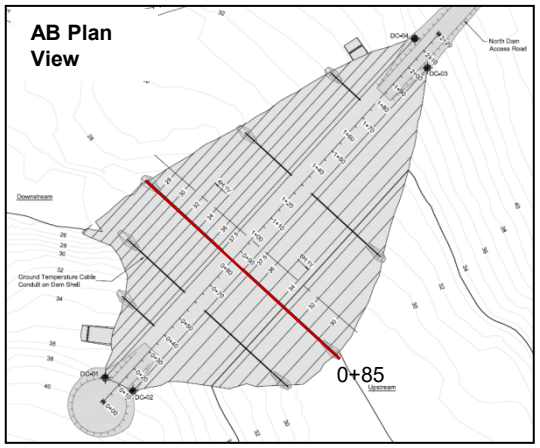

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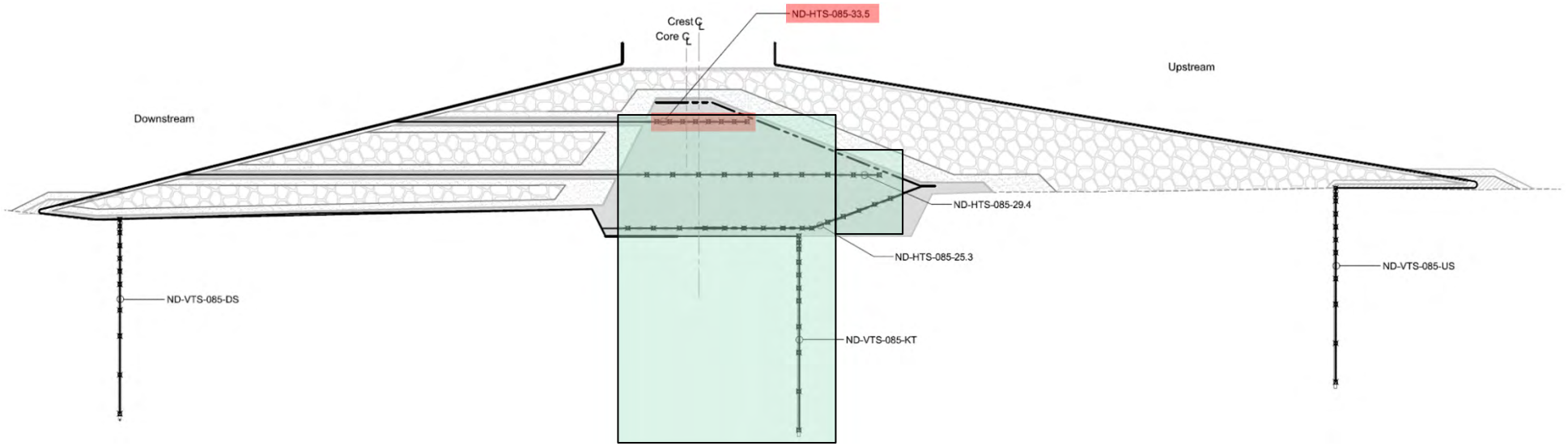

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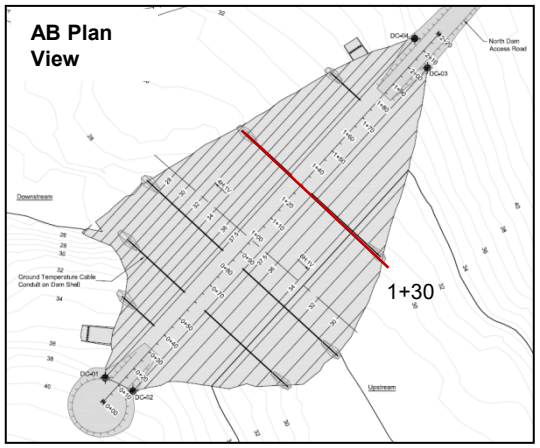

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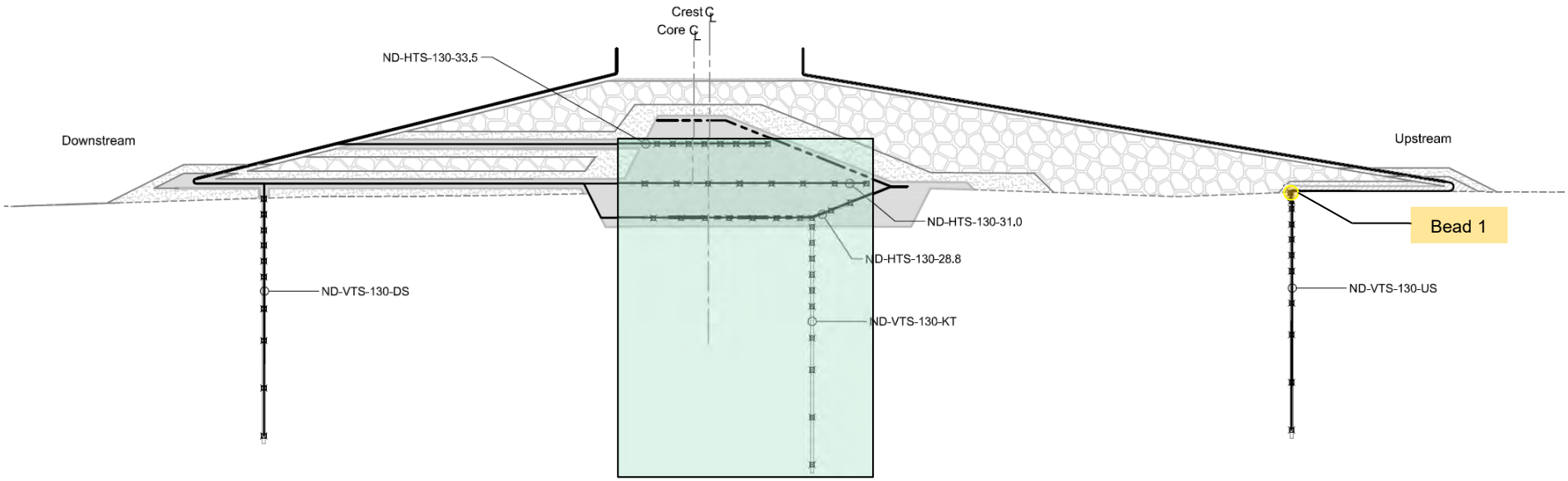
- Excluded Beads



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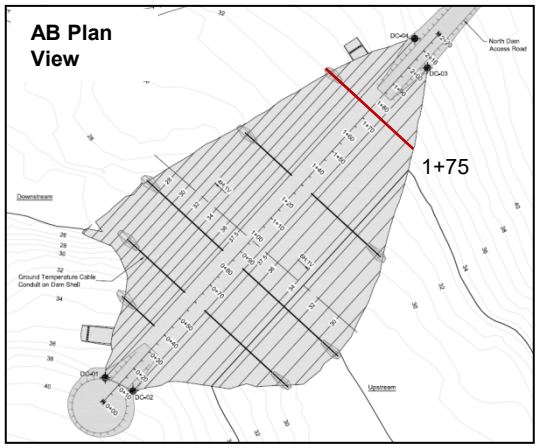

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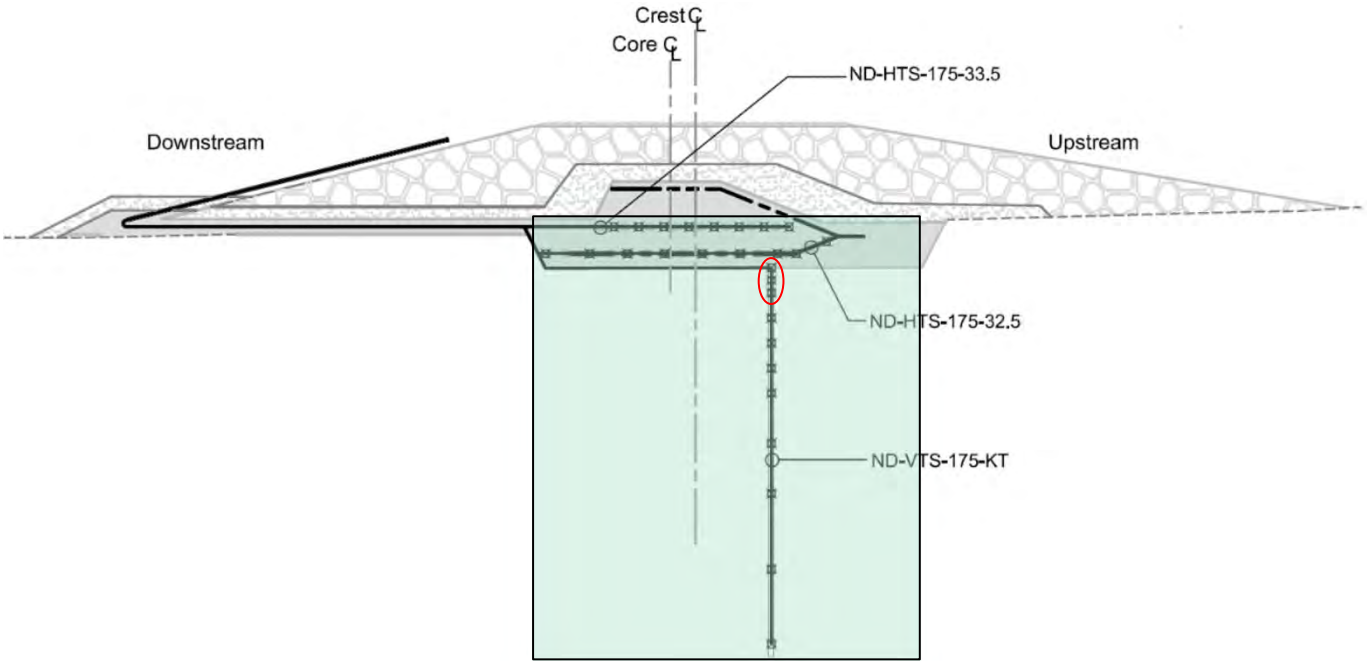

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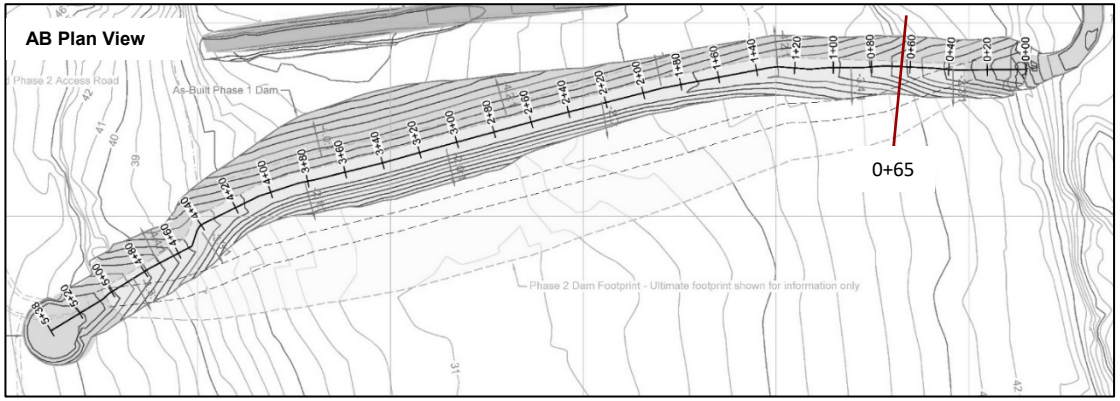

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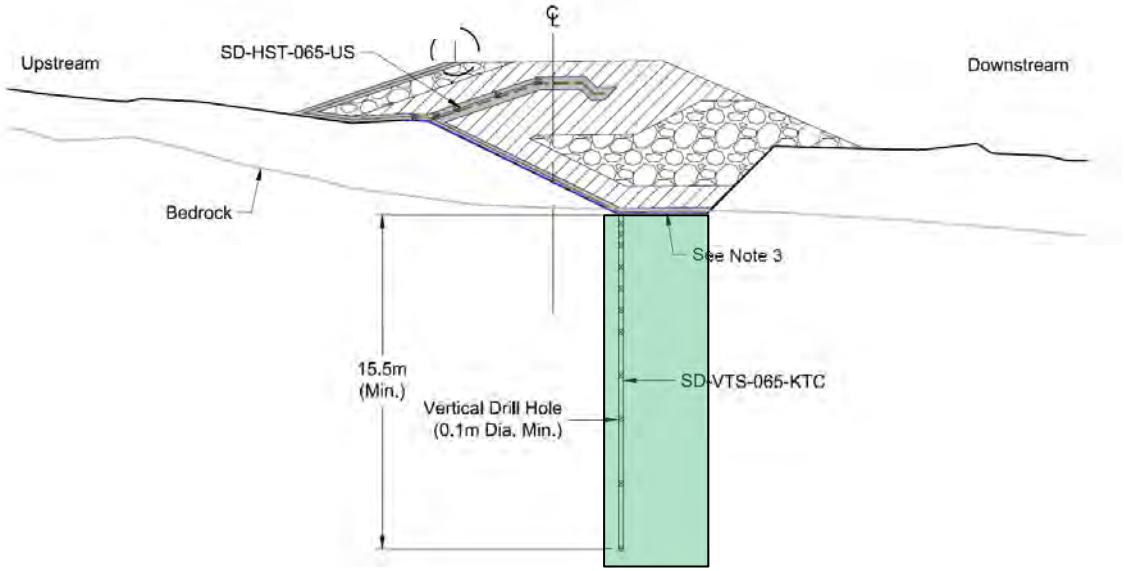
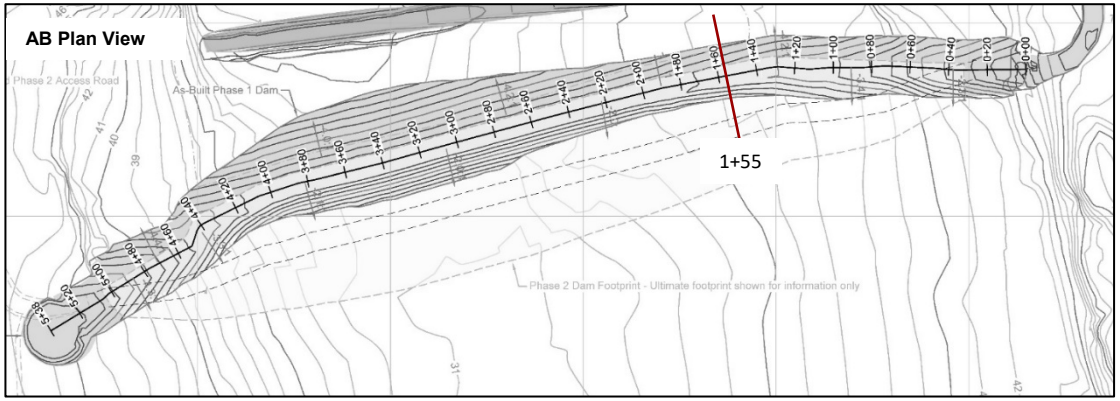
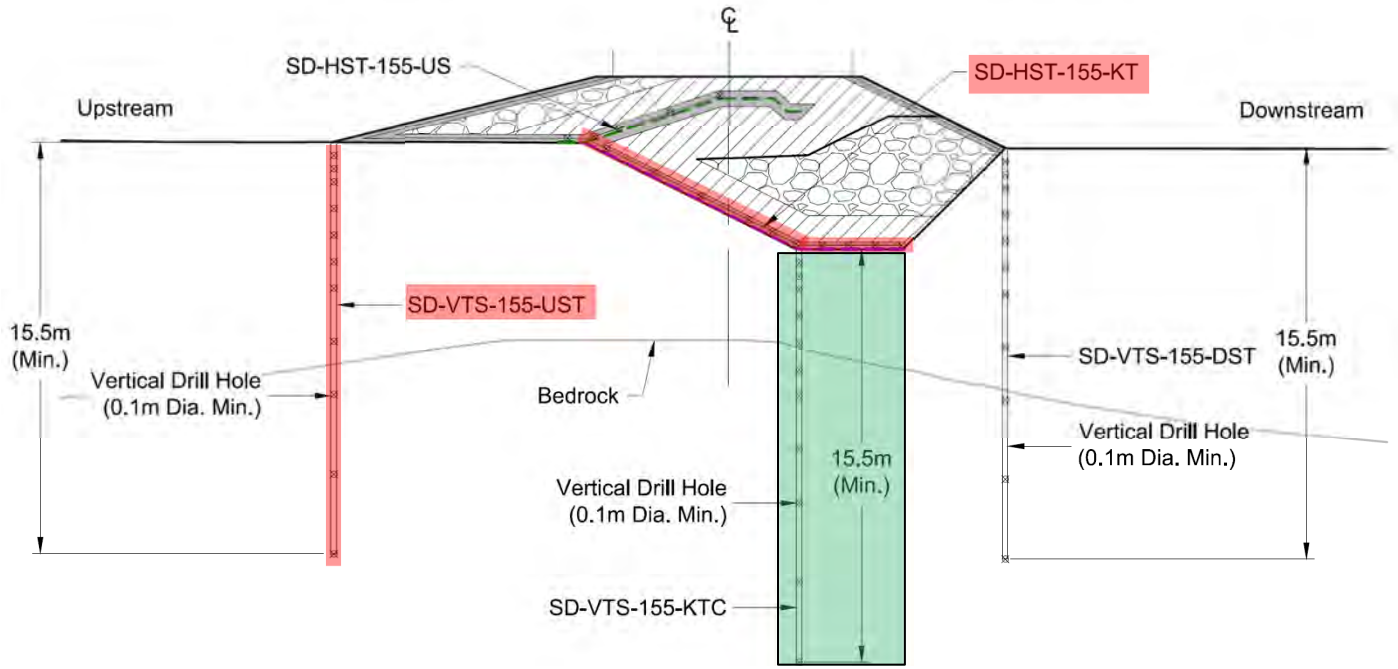


srk consulting	AGNICO EAGLE	TIA GTC TARPS
		South Dam Station 0+65
Proj. No.: CAPR002491 Filename: TIA GTC TARPS_20230308.pptx	**HOPE BAY**	Date: March 2023 / Approved: PL / Figure: **1**

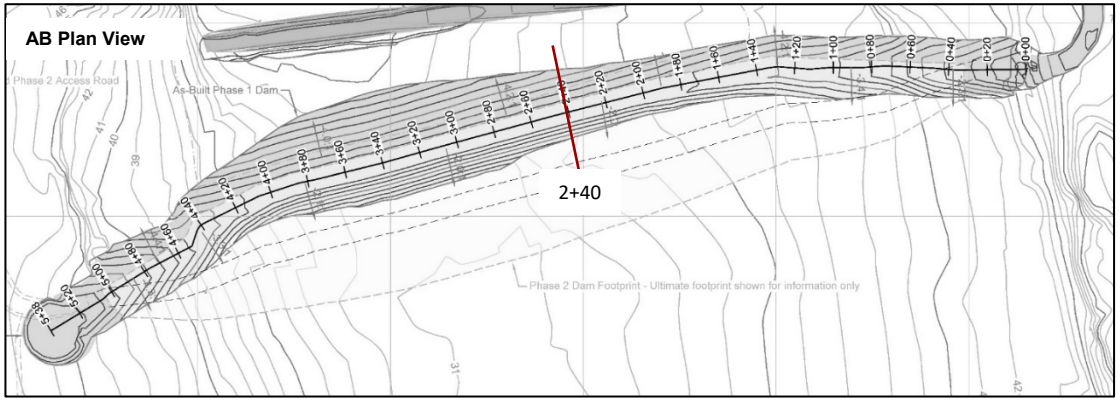


Legend:

- GTC Status: Cable irreparably damaged [Excluded]
- GTC Status: Bead damaged or data missing [Excluded]
- Critical Zone
- Excluded Beads

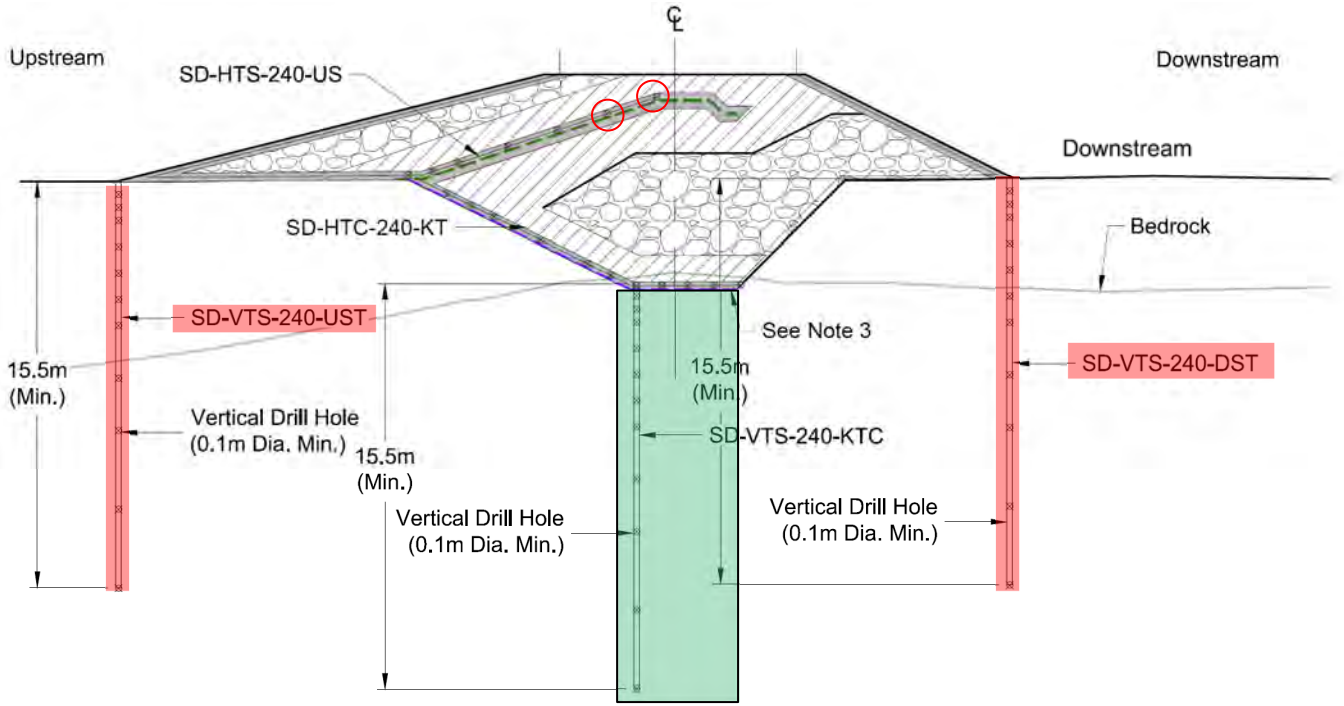


srk consulting	AGNICO EAGLE	TIA GTC TARPS
		South Dam Station 1+55
Proj. No.: CAPR002491 Filename: TIA GTC TARPS_20230308.pptx	**HOPE BAY**	Date: March 2023 / Approved: PL / Figure: **1**

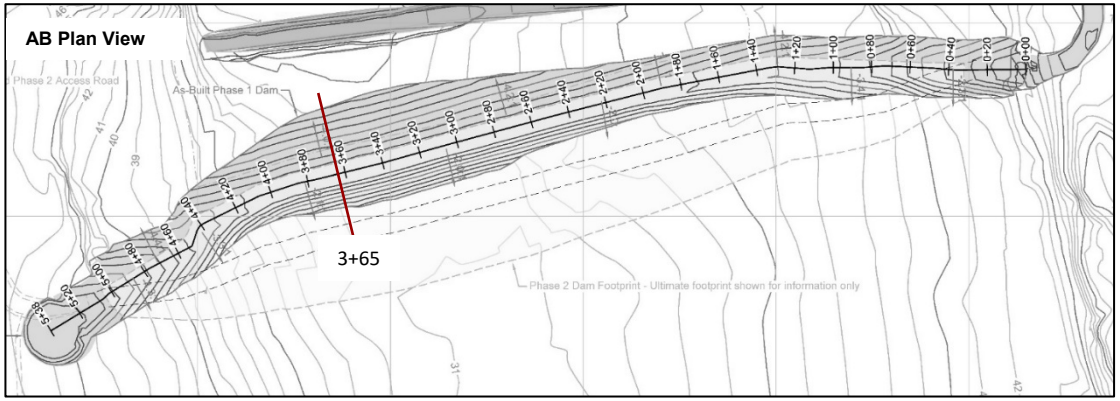


Legend:

- GTC Status: Cable irreparably damaged [Excluded]
- GTC Status: Bead damaged or data missing [Excluded]
- Critical Zone
- Excluded Beads

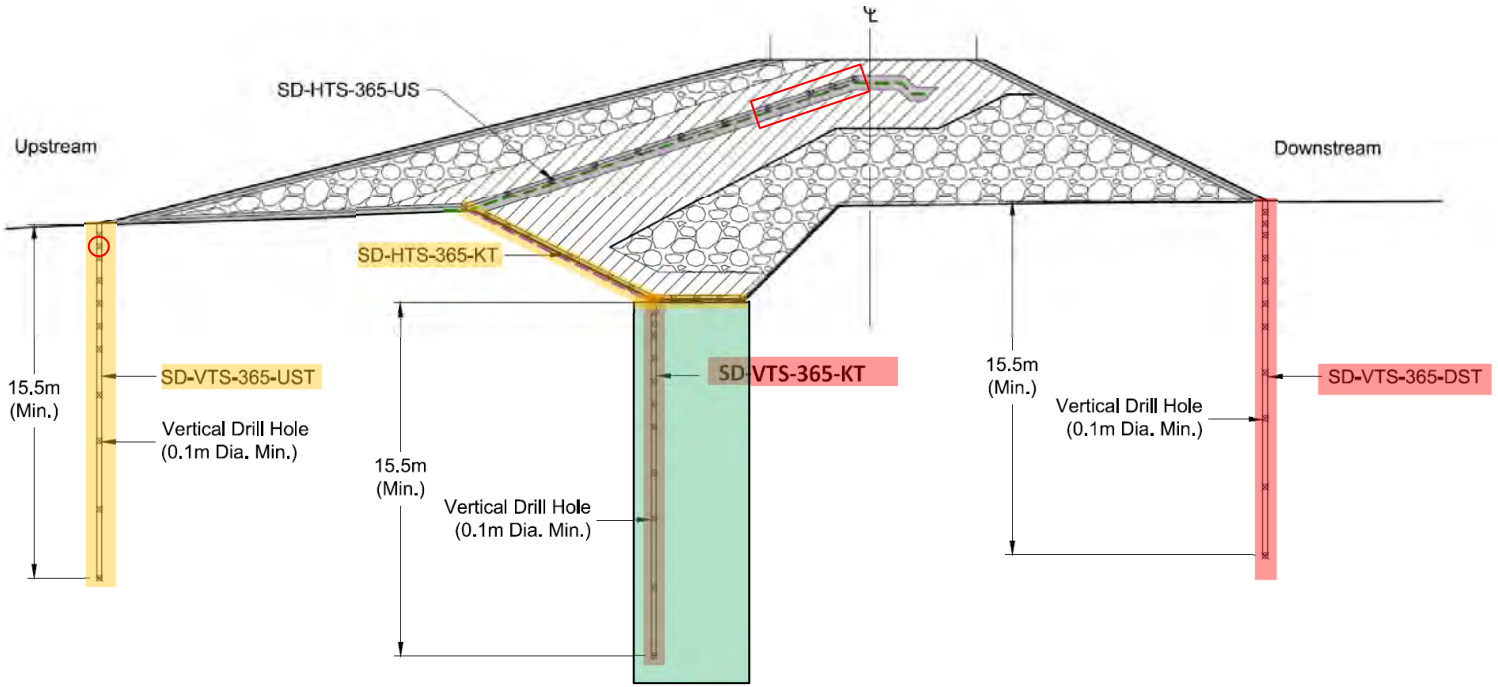


srk consulting	AGNICO EAGLE	TIA GTC TARPS
		South Dam Station 2+40
Proj. No.: CAPR002491 Filename: TIA GTC TARPS_20230308.pptx	**HOPE BAY**	Date: March 2023 / Approved: PL / Figure: **1**

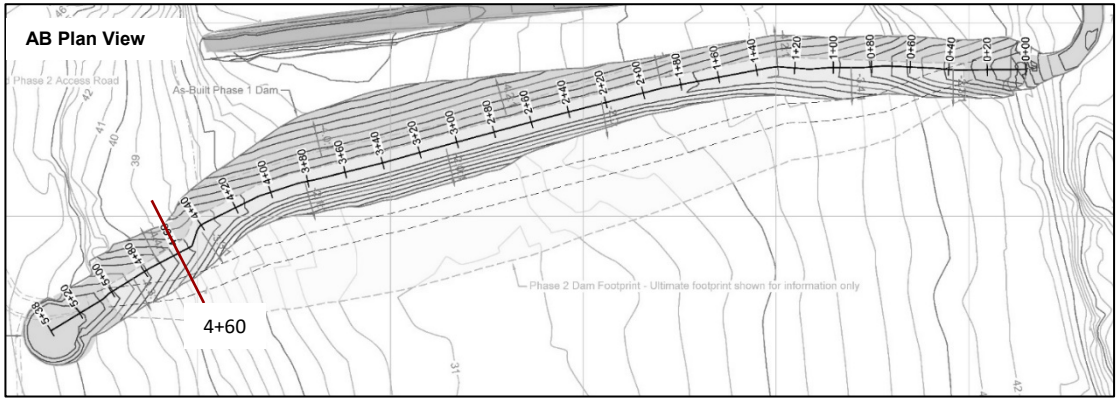


Legend:

- GTC Status: Cable irreparably damaged [Excluded]
- GTC Status: Bead damaged or data missing [Excluded]
- Critical Zone
- Excluded Beads

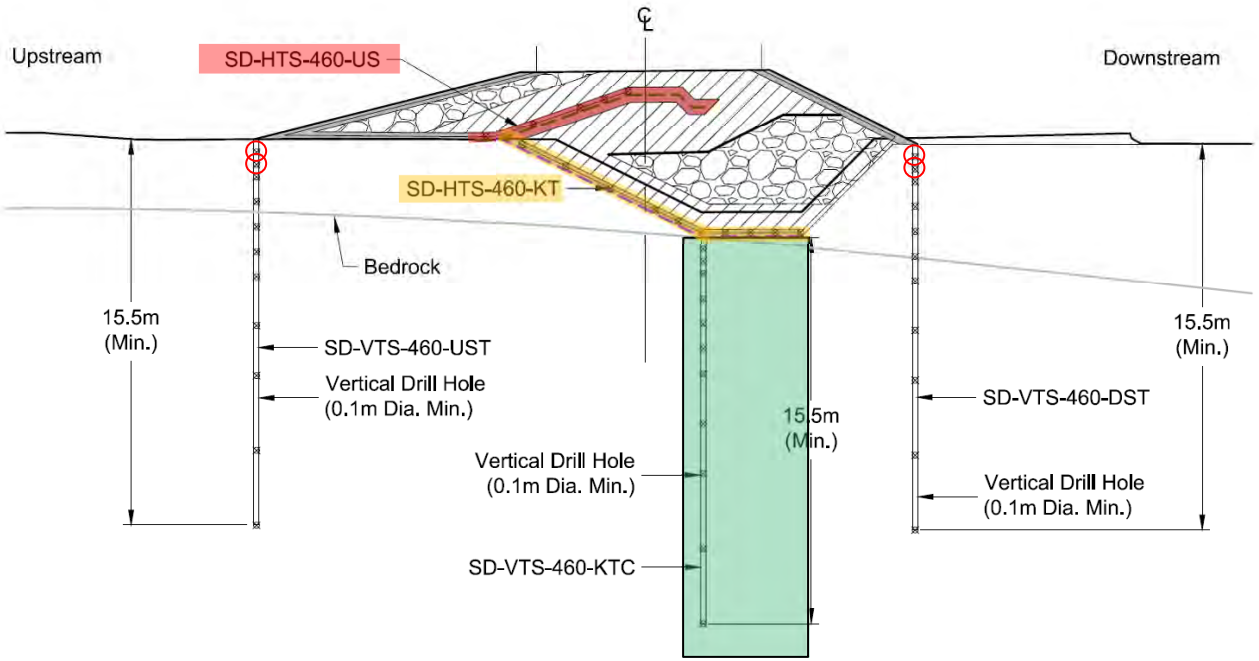


srk consulting	AGNICO EAGLE	TIA GTC TARPS
		South Dam Station 3+65
Proj. No.: CAPR002491 Filename: TIA GTC TARPS_20230308.pptx	**HOPE BAY**	Date: March 2023 / Approved: PL / Figure: **1**

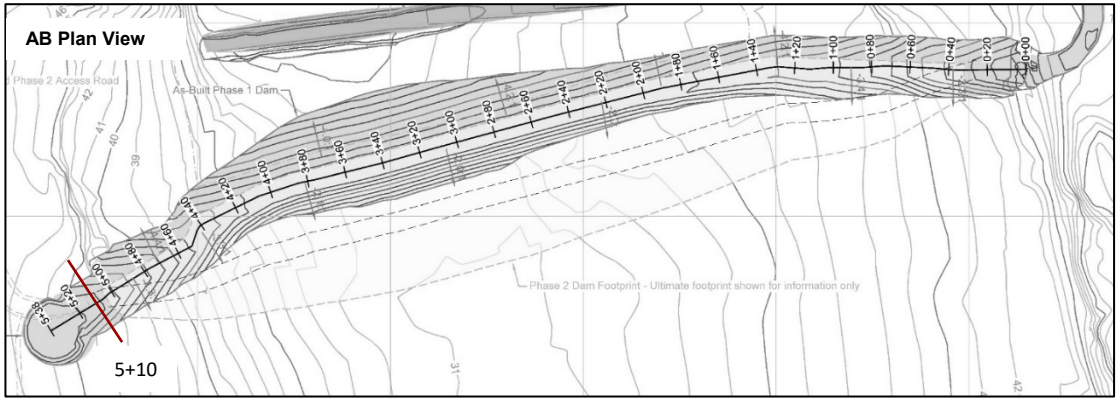


Legend:

- GTC Status: Cable irreparably damaged [Excluded]
- GTC Status: Bead damaged or data missing [Excluded]
- Critical Zone
- Excluded Beads

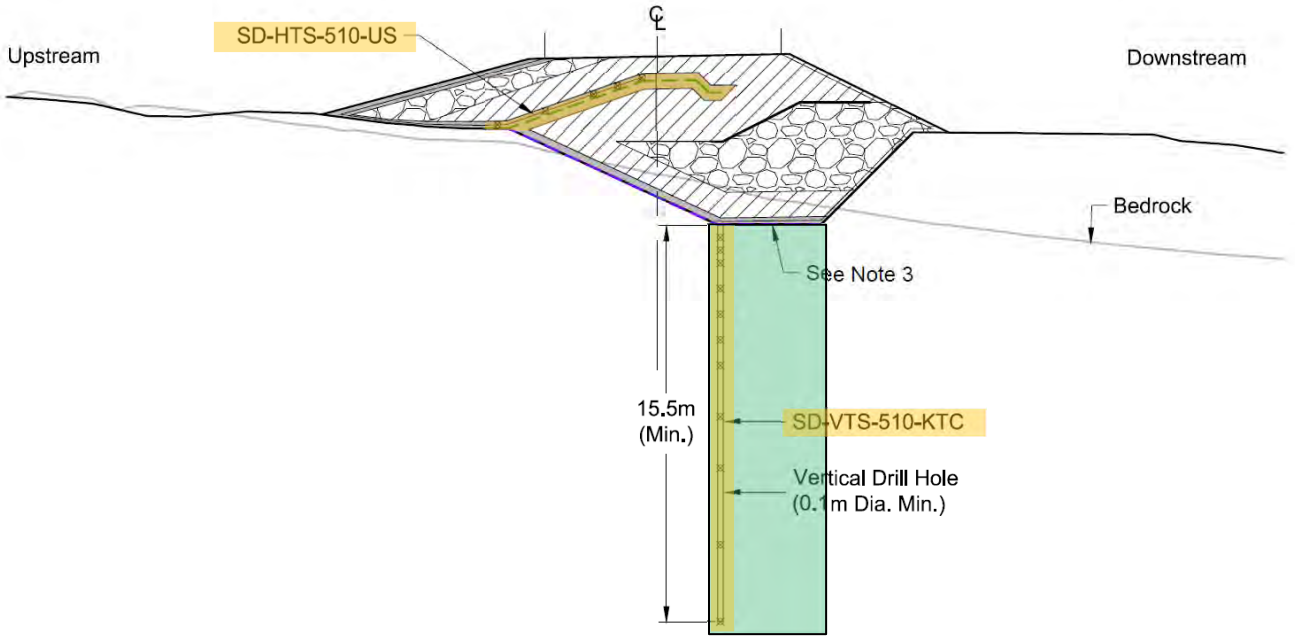


srk consulting	AGNICO EAGLE	TIA GTC TARPS
		South Dam Station 4+60
Proj. No.: CAPR002491 Filename: TIA GTC TARPS_20230308.pptx	**HOPE BAY**	Date: March 2023 | Approved: PL | Figure: **1**



Legend:

- GTC Status: Cable irreparably damaged [Excluded]
- GTC Status: Bead damaged or data missing [Excluded]
- Critical Zone
- Excluded Beads



srk consulting	AGNICO EAGLE	TIA GTC TARPS
		South Dam Station 5+10
Proj. No.: CAPR002491 Filename: TIA GTC TARPS_20230308.pptx	**HOPE BAY**	Date: March 2023 / Approved: PL / Figure: **1**

GTC Code Legend

Structure	TARP Zones	GTC Code
North Dam	Critical Zone - Core Temperature	1
	Critical Zone - Foundation Temperature	1
	Non-Critical Zone - Foundation Temperature	3
	Excluded Beads	4
South Dam	Critical Zone - Foundation Temperature	1
	Non-Critical Zone - Key Trench Base Temperature	2
	Non-Critical Zone - Foundation Temperature Upstream and Downstream, GCL Liner face	3
	Excluded Beads	4
	Upstream Tailings Temperature	5

GTC Table North Dam

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_HTS_040_315	01	1	No	-2
ND_HTS_040_315	02	1	No	-2
ND_HTS_040_315	03	1	No	-2
ND_HTS_040_315	04	1	No	-2
ND_HTS_040_315	05	1	No	-2
ND_HTS_040_315	06	1	No	-2
ND_HTS_040_315	07	1	No	-2
ND_HTS_040_315	08	1	No	-2
ND_HTS_040_315	09	1	No	-2
ND_HTS_040_315	10	1	No	-2
ND_HTS_040_335	01	1	No	-2
ND_HTS_040_335	02	1	No	-2
ND_HTS_040_335	03	1	No	-2
ND_HTS_040_335	04	1	No	-2
ND_HTS_040_335	05	1	No	-2
ND_HTS_040_335	06	1	No	-2
ND_HTS_040_335	07	1	No	-2
ND_HTS_040_335	08	1	No	-2
ND_VTS_040_KT	01	1	No	-8
ND_VTS_040_KT	02	1	No	-8
ND_VTS_040_KT	03	1	No	-8
ND_VTS_040_KT	04	1	No	-8
ND_VTS_040_KT	05	1	No	-8
ND_VTS_040_KT	06	1	No	-8
ND_VTS_040_KT	07	1	No	-8
ND_VTS_040_KT	08	1	No	-8

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_VTS_040_KT	09	1	No	-8
ND_VTS_040_KT	10	1	No	-8
ND_VTS_040_KT	11	1	No	-8
ND_HTS_060_288	01	1	No	-2
ND_HTS_060_288	02	1	No	-2
ND_HTS_060_288	03	1	No	-2
ND_HTS_060_288	04	1	No	-2
ND_HTS_060_288	05	1	No	-2
ND_HTS_060_288	06	1	No	-2
ND_HTS_060_288	07	1	Excluded	-2
ND_HTS_060_288	08	1	No	-2
ND_HTS_060_288	09	1	Excluded	-2
ND_HTS_060_288	10	1	No	-2
ND_HTS_060_310	01	1	No	-2
ND_HTS_060_310	02	1	No	-2
ND_HTS_060_310	03	1	No	-2
ND_HTS_060_310	04	1	No	-2
ND_HTS_060_310	05	1	No	-2
ND_HTS_060_310	06	1	No	-2
ND_HTS_060_310	07	1	No	-2
ND_HTS_060_310	08	1	No	-2
ND_HTS_060_335	01	1	No	-2
ND_HTS_060_335	02	1	No	-2
ND_HTS_060_335	03	1	No	-2

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_HTS_060_335	04	1	No	-2
ND_HTS_060_335	05	1	No	-2
ND_HTS_060_335	06	1	No	-2
ND_HTS_060_335	07	1	No	-2
ND_HTS_060_335	08	1	No	-2
ND_VTS_060_DS	01	3	No	None
ND_VTS_060_DS	02	3	No	None
ND_VTS_060_DS	03	3	No	None
ND_VTS_060_DS	04	3	No	None
ND_VTS_060_DS	05	3	No	None
ND_VTS_060_DS	06	3	No	None
ND_VTS_060_DS	07	3	No	None
ND_VTS_060_DS	08	3	No	None
ND_VTS_060_DS	09	3	No	None
ND_VTS_060_DS	10	3	No	None
ND_VTS_060_DS	11	3	No	None
ND_VTS_060_KT	01	1	No	-8
ND_VTS_060_KT	02	1	No	-8
ND_VTS_060_KT	03	1	No	-8
ND_VTS_060_KT	04	1	No	-8
ND_VTS_060_KT	05	1	No	-8
ND_VTS_060_KT	06	1	No	-8
ND_VTS_060_KT	07	1	No	-8
ND_VTS_060_KT	08	1	No	-8
ND_VTS_060_KT	09	1	No	-8
ND_VTS_060_KT	10	1	No	-8
ND_VTS_060_KT	11	1	No	-8
ND_VTS_060_US	01	3	Excluded	None

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_VTS_060_US	02	3	Excluded	None
ND_VTS_060_US	03	3	Excluded	None
ND_VTS_060_US	04	3	Excluded	None
ND_VTS_060_US	05	3	Excluded	None
ND_VTS_060_US	06	3	Excluded	None
ND_VTS_060_US	07	3	Excluded	None
ND_VTS_060_US	08	3	Excluded	None
ND_VTS_060_US	09	3	Excluded	None
ND_VTS_060_US	10	3	Excluded	None
ND_VTS_060_US	11	3	Excluded	None
ND_HTS_085_253	01	1	No	-2
ND_HTS_085_253	02	1	No	-2
ND_HTS_085_253	03	1	No	-2
ND_HTS_085_253	04	1	No	-2
ND_HTS_085_253	05	1	No	-2
ND_HTS_085_253	06	1	No	-2
ND_HTS_085_253	07	1	No	-2
ND_HTS_085_253	08	1	No	-2
ND_HTS_085_253	09	1	No	-2
ND_HTS_085_253	10	1	No	-2
ND_HTS_085_253	11	1	No	-2
ND_HTS_085_253	12	1	No	-2

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_HTS_085_253	13	1	No	-2
ND_HTS_085_253	14	1	No	-2
ND_HTS_085_253	15	1	No	-2
ND_HTS_085_294	01	1	No	-2
ND_HTS_085_294	02	1	No	-2
ND_HTS_085_294	03	1	No	-2
ND_HTS_085_294	04	1	No	-2
ND_HTS_085_294	05	1	No	-2
ND_HTS_085_294	06	1	No	-2
ND_HTS_085_294	07	1	No	-2
ND_HTS_085_294	08	1	No	-2
ND_HTS_085_294	09	1	No	-2
ND_HTS_085_294	10	1	No	-2
ND_HTS_085_335	01	1	Excluded	-2
ND_HTS_085_335	02	1	Excluded	-2
ND_HTS_085_335	03	1	Excluded	-2
ND_HTS_085_335	04	1	Excluded	-2
ND_HTS_085_335	05	1	Excluded	-2
ND_HTS_085_335	06	1	Excluded	-2
ND_HTS_085_335	07	1	Excluded	-2
ND_HTS_085_335	08	1	Excluded	-2
ND_VTS_085_DS	01	3	No	None

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_VTS_085_DS	02	3	No	None
ND_VTS_085_DS	03	3	No	None
ND_VTS_085_DS	04	3	No	None
ND_VTS_085_DS	05	3	No	None
ND_VTS_085_DS	06	3	No	None
ND_VTS_085_DS	07	3	No	None
ND_VTS_085_DS	08	3	No	None
ND_VTS_085_DS	09	3	No	None
ND_VTS_085_DS	10	3	No	None
ND_VTS_085_DS	11	3	No	None
ND_VTS_085_KT	01	1	No	-8
ND_VTS_085_KT	02	1	No	-8
ND_VTS_085_KT	03	1	No	-8
ND_VTS_085_KT	04	1	No	-8
ND_VTS_085_KT	05	1	No	-8
ND_VTS_085_KT	06	1	No	-8
ND_VTS_085_KT	07	1	No	-8
ND_VTS_085_KT	08	1	No	-8
ND_VTS_085_KT	09	1	No	-8
ND_VTS_085_KT	10	1	No	-8
ND_VTS_085_KT	11	1	No	-8
ND_VTS_085_US	01	3	Excluded	None
ND_VTS_085_US	02	3	No	None
ND_VTS_085_US	03	3	No	None
ND_VTS_085_US	04	3	No	None
ND_VTS_085_US	05	3	No	None
ND_VTS_085_US	06	3	No	None
ND_VTS_085_US	07	3	No	None

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_VTS_085_US	08	3	No	None
ND_VTS_085_US	09	3	No	None
ND_VTS_085_US	10	3	No	None
ND_VTS_085_US	11	3	No	None
ND_HTS_130_288	01	1	No	-2
ND_HTS_130_288	02	1	No	-2
ND_HTS_130_288	03	1	No	-2
ND_HTS_130_288	04	1	No	-2
ND_HTS_130_288	05	1	No	-2
ND_HTS_130_288	06	1	No	-2
ND_HTS_130_288	07	1	No	-2
ND_HTS_130_288	08	1	No	-2
ND_HTS_130_288	09	1	No	-2
ND_HTS_130_288	10	1	No	-2
ND_HTS_130_310	01	1	No	-2
ND_HTS_130_310	02	1	No	-2
ND_HTS_130_310	03	1	No	-2
ND_HTS_130_310	04	1	No	-2
ND_HTS_130_310	05	1	No	-2
ND_HTS_130_310	06	1	No	-2
ND_HTS_130_310	07	1	No	-2
ND_HTS_130_310	08	1	No	-2

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_HTS_130_335	01	1	No	-2
ND_HTS_130_335	02	1	No	-2
ND_HTS_130_335	03	1	No	-2
ND_HTS_130_335	04	1	No	-2
ND_HTS_130_335	05	1	No	-2
ND_HTS_130_335	06	1	No	-2
ND_HTS_130_335	07	1	No	-2
ND_HTS_130_335	08	1	No	-2
ND_VTS_130_DS	01	3	No	None
ND_VTS_130_DS	02	3	No	None
ND_VTS_130_DS	03	3	No	None
ND_VTS_130_DS	04	3	No	None
ND_VTS_130_DS	05	3	No	None
ND_VTS_130_DS	06	3	No	None
ND_VTS_130_DS	07	3	No	None
ND_VTS_130_DS	08	3	No	None
ND_VTS_130_DS	09	3	No	None
ND_VTS_130_DS	10	3	No	None
ND_VTS_130_DS	11	3	No	None
ND_VTS_130_KT	01	1	No	-8
ND_VTS_130_KT	02	1	No	-8
ND_VTS_130_KT	03	1	No	-8
ND_VTS_130_KT	04	1	No	-8
ND_VTS_130_KT	05	1	No	-8
ND_VTS_130_KT	06	1	No	-8
ND_VTS_130_KT	07	1	No	-8

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_VTS_130_KT	08	1	No	-8
ND_VTS_130_KT	09	1	No	-8
ND_VTS_130_KT	10	1	No	-8
ND_VTS_130_KT	11	1	No	-8
ND_VTS_130_US	01	3	No	None
ND_VTS_130_US	02	3	No	None
ND_VTS_130_US	03	3	No	None
ND_VTS_130_US	04	3	No	None
ND_VTS_130_US	05	3	No	None
ND_VTS_130_US	06	3	No	None
ND_VTS_130_US	07	3	No	None
ND_VTS_130_US	08	3	No	None
ND_VTS_130_US	09	3	No	None
ND_VTS_130_US	10	3	No	None
ND_VTS_130_US	11	3	No	None
ND_HTS_175_325	01	1	No	-2
ND_HTS_175_325	02	1	No	-2
ND_HTS_175_325	03	1	No	-2
ND_HTS_175_325	04	1	No	-2
ND_HTS_175_325	05	1	No	-2
ND_HTS_175_325	06	1	No	-2
ND_HTS_175_325	07	1	No	-2
ND_HTS_175_325	08	1	No	-2
ND_HTS_175_325	09	1	No	-2

Cable	Bead	GTC Code	Excluded	Trigger Temperature
ND_HTS_175_335	01	1	No	-2
ND_HTS_175_335	02	1	No	-2
ND_HTS_175_335	03	1	No	-2
ND_HTS_175_335	04	1	No	-2
ND_HTS_175_335	05	1	No	-2
ND_HTS_175_335	06	1	No	-2
ND_HTS_175_335	07	1	No	-2
ND_HTS_175_335	08	1	No	-2
ND_VTS_175_KT	01	1	Excluded	-8
ND_VTS_175_KT	02	1	Excluded	-8
ND_VTS_175_KT	03	1	Excluded	-8
ND_VTS_175_KT	04	1	No	-8
ND_VTS_175_KT	05	1	No	-8
ND_VTS_175_KT	06	1	No	-8
ND_VTS_175_KT	07	1	No	-8
ND_VTS_175_KT	08	1	No	-8
ND_VTS_175_KT	09	1	No	-8
ND_VTS_175_KT	10	1	No	-8
ND_VTS_175_KT	11	1	No	-8

GTC Table North Dam

Cable	Bead	GTC Code	Excluded	Trigger Temperature
SD_HTS_065_US	01	3	No	None
SD_HTS_065_US	02	3	No	None
SD_HTS_065_US	03	3	No	None
SD_HTS_065_US	04	3	No	None
SD_HTS_065_US	05	3	No	None
SD_VTS_065_KT	01	1	No	0
SD_VTS_065_KT	02	1	No	0
SD_VTS_065_KT	03	1	No	0
SD_VTS_065_KT	04	1	No	0
SD_VTS_065_KT	05	1	No	0
SD_VTS_065_KT	06	1	No	0
SD_VTS_065_KT	07	1	No	0
SD_VTS_065_KT	08	1	No	0
SD_VTS_065_KT	09	1	No	0
SD_VTS_065_KT	10	1	No	0
SD_VTS_065_KT	11	1	No	0
SD_HTS_155_US	01	3	No	None
SD_HTS_155_US	02	3	No	None
SD_HTS_155_US	03	3	No	None
SD_HTS_155_US	04	3	No	None
SD_HTS_155_US	05	3	No	None
SD_VTS_155_DS	01	3	No	None
SD_VTS_155_DS	02	3	No	None
SD_VTS_155_DS	03	3	No	None
SD_VTS_155_DS	04	3	No	None
SD_VTS_155_DS	05	3	No	None
SD_VTS_155_DS	06	3	No	None
SD_VTS_155_DS	07	3	No	None
SD_VTS_155_DS	08	3	No	None
SD_VTS_155_DS	09	3	No	None
SD_VTS_155_DS	10	3	No	None
SD_VTS_155_DS	11	3	No	None
SD_VTS_155_KT	01	1	No	0

Cable	Bead	GTC Code	Excluded	Trigger Temperature
SD_VTS_155_KT	02	1	No	0
SD_VTS_155_KT	03	1	No	0
SD_VTS_155_KT	04	1	No	0
SD_VTS_155_KT	05	1	No	0
SD_VTS_155_KT	06	1	No	0
SD_VTS_155_KT	07	1	No	0
SD_VTS_155_KT	08	1	No	0
SD_VTS_155_KT	09	1	No	0
SD_VTS_155_KT	10	1	No	0
SD_VTS_155_KT	11	1	No	0
SD_VTS_155_US	01	3	Excluded	None
SD_VTS_155_US	02	3	Excluded	None
SD_VTS_155_US	03	3	Excluded	None
SD_VTS_155_US	04	3	Excluded	None
SD_VTS_155_US	05	3	Excluded	None
SD_VTS_155_US	06	3	Excluded	None
SD_VTS_155_US	07	3	Excluded	None
SD_VTS_155_US	08	3	Excluded	None
SD_VTS_155_US	09	3	Excluded	None
SD_VTS_155_US	10	3	Excluded	None
SD_VTS_155_US	11	3	Excluded	None
SD_HTS_240_KT	01	2	Excluded	0
SD_HTS_240_KT	02	2	No	0
SD_HTS_240_KT	03	2	No	0
SD_HTS_240_KT	04	2	No	0
SD_HTS_240_KT	05	2	No	0
SD_HTS_240_KT	06	2	No	0
SD_HTS_240_KT	07	2	No	0
SD_HTS_240_KT	08	2	No	0
SD_HTS_240_KT	09	2	No	0
SD_HTS_240_KT	10	2	No	0
SD_HTS_240_KT	11	2	No	0
SD_HTS_240_US	01	3	No	None
SD_HTS_240_US	02	3	No	None
SD_HTS_240_US	03	3	No	None
SD_HTS_240_US	04	3	No	None
SD_HTS_240_US	05	3	No	None
SD_HTS_240_US	06	3	No	None

Cable	Bead	GTC Code	Excluded	Trigger Temperature
SD_HTS_240_US	07	3	No	None
SD_VTS_240_DS	01	3	Excluded	None
SD_VTS_240_DS	02	3	Excluded	None
SD_VTS_240_DS	03	3	Excluded	None
SD_VTS_240_DS	04	3	Excluded	None
SD_VTS_240_DS	05	3	Excluded	None
SD_VTS_240_DS	06	3	Excluded	None
SD_VTS_240_DS	07	3	Excluded	None
SD_VTS_240_DS	08	3	Excluded	None
SD_VTS_240_DS	09	3	Excluded	None
SD_VTS_240_DS	10	3	Excluded	None
SD_VTS_240_DS	11	3	Excluded	None
SD_VTS_240_KT	01	1	No	0
SD_VTS_240_KT	02	1	No	0
SD_VTS_240_KT	03	1	No	0
SD_VTS_240_KT	04	1	No	0
SD_VTS_240_KT	05	1	No	0
SD_VTS_240_KT	06	1	No	0
SD_VTS_240_KT	07	1	No	0
SD_VTS_240_KT	08	1	No	0
SD_VTS_240_KT	09	1	No	0
SD_VTS_240_KT	10	1	No	0
SD_VTS_240_KT	11	1	No	0
SD_VTS_240_US	01	3	Excluded	None
SD_VTS_240_US	02	3	Excluded	None
SD_VTS_240_US	03	3	Excluded	None
SD_VTS_240_US	04	3	Excluded	None
SD_VTS_240_US	05	3	Excluded	None

Cable	Bead	GTC Code	Excluded	Trigger Temperature
SD_VTS_240_US	06	3	Excluded	None
SD_VTS_240_US	07	3	Excluded	None
SD_VTS_240_US	08	3	Excluded	None
SD_VTS_240_US	09	3	Excluded	None
SD_VTS_240_US	10	3	Excluded	None
SD_VTS_240_US	11	3	Excluded	None
SD_HTS_365_KT	01	2	Excluded	0
SD_HTS_365_KT	02	2	Excluded	0
SD_HTS_365_KT	03	2	Excluded	0
SD_HTS_365_KT	04	2	Excluded	0
SD_HTS_365_KT	05	2	Excluded	0
SD_HTS_365_KT	06	2	Excluded	0
SD_HTS_365_KT	07	2	Excluded	0
SD_HTS_365_KT	08	2	Excluded	0
SD_HTS_365_KT	09	2	Excluded	0
SD_HTS_365_KT	10	2	Excluded	0
SD_HTS_365_KT	11	2	Excluded	0
SD_HTS_365_US	01	3	No	None
SD_HTS_365_US	02	3	No	None
SD_HTS_365_US	03	3	No	None
SD_HTS_365_US	04	3	No	None
SD_HTS_365_US	05	3	No	None
SD_HTS_365_US	06	3	No	None
SD_HTS_365_US	07	3	No	None
SD_HTS_365_US	08	3	No	None
SD_HTS_365_US	09	3	No	None
SD_HTS_365_US	10	3	No	None
SD_HTS_365_US	11	3	No	None

Cable	Bead	GTC Code	Excluded	Trigger Temperature
SD_VTS_365_DS	01	3	Excluded	None
SD_VTS_365_DS	02	3	Excluded	None
SD_VTS_365_DS	03	3	Excluded	None
SD_VTS_365_DS	04	3	Excluded	None
SD_VTS_365_DS	05	3	Excluded	None
SD_VTS_365_DS	06	3	Excluded	None
SD_VTS_365_DS	07	3	Excluded	None
SD_VTS_365_DS	08	3	Excluded	None
SD_VTS_365_DS	09	3	Excluded	None
SD_VTS_365_DS	10	3	Excluded	None
SD_VTS_365_DS	11	3	Excluded	None
SD_VTS_365_US	01	3	Excluded	None
SD_VTS_365_US	02	3	Excluded	None
SD_VTS_365_US	03	3	Excluded	None
SD_VTS_365_US	04	3	Excluded	None
SD_VTS_365_US	05	3	Excluded	None
SD_VTS_365_US	06	3	Excluded	None
SD_VTS_365_US	07	3	Excluded	None
SD_VTS_365_US	08	3	Excluded	None
SD_VTS_365_US	09	3	Excluded	None
SD_VTS_365_US	10	3	Excluded	None
SD_VTS_365_US	11	3	Excluded	None
SD_HTS_460_KT	01	2	Excluded	0

Cable	Bead	GTC Code	Excluded	Trigger Temperature
SD_HTS_460_KT	02	2	Excluded	0
SD_HTS_460_KT	03	2	Excluded	0
SD_HTS_460_KT	04	2	Excluded	0
SD_HTS_460_KT	05	2	Excluded	0
SD_HTS_460_KT	06	2	Excluded	0
SD_HTS_460_KT	07	2	Excluded	0
SD_HTS_460_KT	08	2	Excluded	0
SD_HTS_460_KT	09	2	Excluded	0
SD_HTS_460_KT	10	2	Excluded	0
SD_HTS_460_KT	11	2	Excluded	0
SD_VTS_460_DS	01	3	Excluded	None
SD_VTS_460_DS	02	3	Excluded	None
SD_VTS_460_DS	03	3	No	None
SD_VTS_460_DS	04	3	No	None
SD_VTS_460_DS	05	3	No	None
SD_VTS_460_DS	06	3	No	None
SD_VTS_460_DS	07	3	No	None
SD_VTS_460_DS	08	3	No	None
SD_VTS_460_DS	09	3	No	None
SD_VTS_460_DS	10	3	No	None
SD_VTS_460_DS	11	3	No	None
SD_VTS_460_KT	01	1	No	0
SD_VTS_460_KT	02	1	No	0
SD_VTS_460_KT	03	1	No	0
SD_VTS_460_KT	04	1	No	0
SD_VTS_460_KT	05	1	No	0
SD_VTS_460_KT	06	1	No	0
SD_VTS_460_KT	07	1	No	0
SD_VTS_460_KT	08	1	No	0
SD_VTS_460_KT	09	1	No	0
SD_VTS_460_KT	10	1	No	0
SD_VTS_460_KT	11	1	No	0
SD_VTS_460_US	01	3	Excluded	None

Cable	Bead	GTC Code	Excluded	Trigger Temperature
SD_VTS_460_US	02	3	Excluded	None
SD_VTS_460_US	03	3	No	None
SD_VTS_460_US	04	3	No	None
SD_VTS_460_US	05	3	No	None
SD_VTS_460_US	06	3	No	None
SD_VTS_460_US	07	3	No	None
SD_VTS_460_US	08	3	No	None
SD_VTS_460_US	09	3	No	None
SD_VTS_460_US	10	3	No	None
SD_VTS_460_US	11	3	No	None
SD_HTS_510_US	01	3	Excluded	None
SD_HTS_510_US	02	3	Excluded	None
SD_HTS_510_US	03	3	Excluded	None
SD_HTS_510_US	04	3	Excluded	None
SD_HTS_510_US	05	3	Excluded	None
SD_VTS_510_KT	01	1	Excluded	None
SD_VTS_510_KT	02	1	Excluded	None
SD_VTS_510_KT	03	1	Excluded	None
SD_VTS_510_KT	04	1	Excluded	None
SD_VTS_510_KT	05	1	Excluded	None
SD_VTS_510_KT	06	1	Excluded	None
SD_VTS_510_KT	07	1	Excluded	None
SD_VTS_510_KT	08	1	Excluded	None
SD_VTS_510_KT	09	1	Excluded	None
SD_VTS_510_KT	10	1	Excluded	None
SD_VTS_510_KT	11	1	Excluded	None
SD_HTS_B1_KT	01	2	No	None
SD_HTS_B1_KT	02	2	No	None
SD_HTS_B1_KT	03	2	No	None
SD_HTS_B1_KT	04	2	No	None

Cable	Bead	GTC Code	Excluded	Trigger Temperature
SD_HTS_B1_KT	05	2	No	None
SD_HTS_B1_KT	06	2	No	None
SD_HTS_B1_KT	07	2	No	None
SD_HTS_B1_KT	08	2	No	None
SD_HTS_B1_KT	09	2	No	None
SD_HTS_B1_KT	10	2	No	None
SD_HTS_B1_KT	11	2	No	None
SD_HTS_B1_KT	12	2	No	None
SD_HTS_B1_KT	13	2	No	None
SD_HTS_B1_KT	14	2	No	None
SD_HTS_B1_KT	15	2	No	None
SD_HTS_B1_KT	16	2	No	None
SD_HTS_B1_KT	17	2	No	None
SD_HTS_B1_KT	18	2	No	None
SD_HTS_B1_KT	19	2	No	None
SD_HTS_B1_KT	20	2	No	None
SD_VTS_US1	01	5	No	None
SD_VTS_US1	02	5	No	None
SD_VTS_US1	03	5	Excluded	None
SD_VTS_US1	04	5	Excluded	None
SD_VTS_US1	05	5	Excluded	None
SD_VTS_US1	06	5	Excluded	None
SD_VTS_US1	07	5	Excluded	None
SD_VTS_US1	08	5	Excluded	None
SD_VTS_US1	09	5	Excluded	None
SD_VTS_US1	10	5	Excluded	None
SD_VTS_US1	11	5	Excluded	None
SD_VTS_US1	12	5	Excluded	None
SD_VTS_US1	13	5	Excluded	None
SD_VTS_US2	01	5	No	None
SD_VTS_US2	02	5	Excluded	None
SD_VTS_US2	03	5	Excluded	None
SD_VTS_US2	04	5	Excluded	None
SD_VTS_US2	05	5	Excluded	None
SD_VTS_US2	06	5	Excluded	None
SD_VTS_US2	07	5	Excluded	None
SD_VTS_US2	08	5	Excluded	None
SD_VTS_US2	09	5	Excluded	None
SD_VTS_US2	10	5	Excluded	None
SD_VTS_US2	11	5	Excluded	None
SD_VTS_US2	12	5	Excluded	None
SD_VTS_US2	13	5	Excluded	None
SD_VTS_US2	14	5	Excluded	None
SD_VTS_US2	15	5	Excluded	None