

**ENVIRONMENTAL PROTECTION PLAN**

**TATA Steel Minerals Canada Ltd.  
DSO Project Activities**



**Reviewed By:**

**Approved By:**

**Date:**



**TATA Steel Minerals Canada Ltd.**

**DSO Project Activities**

**Environmental Protection Plan**

**TATA Steel Minerals Canada Ltd.  
1000 Sherbrooke West, Suite 1120**

**Montreal, QC**

**H3A 3G4**

**10 April, 2015**

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**Preface**

Tata Steel Minerals Canada Ltd. (TSMC), a joint venture between Tata Steel Europe (80% interest) and New Millennium Iron Corp. (NML) (20% interest), have begun the development of the Direct-Shipping Ore Project (DSO Project). Preproduction (direct shipping without processing) began in 2012 and a plant will be in operation in spring 2015. The beginning of 2015 will be strategic in point of view of plant commissioning. The DSO Project is divided in different subdivisions;

DSO3 ( NL) – 1a	DSO3 ( Qc) – 1b	DOS4 – 2b ( NL)	DSO4 2a ( Qc)
2012	Not to be mined	2015	2016
Timmins 3N,4,7	Ferriman 4 ( not in mining plan )	Kivivic 1c,2,3N,4,5	Sunny 1
Fleming 7 N		Timmins 8 ( no to be mine)	goodwood
			Kivivic 3 S
			Leroy 1s

**Table 1. DSO Project sites**

The DSO-3 site is located approximately 20 km north-west of Schefferville, Quebec. This area will include all the services including maintenance, camp, plant complex and associated buildings. DSO 4 is located approximately 35 km north of DSO3 & 50 km north of Schefferville. DSO 1 and DSO 2 are located in Quebec and exploration is planned between 2014 and 2016. At this time, no mining operation is planned in these areas. This EPP is intended to address all activities regarding the mining operations of DSO3 and DSO4.

**1.0. Introduction**

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TATA Steel Minerals Canada Ltd. (TSMC) recognizes that activities undertaken at the Direct Shipping Ore (DSO) 3 / DSO 4 (2a & 2b) must be conducted in a manner that minimizes adverse effects on the environment. TSMC also believes that environmental stewardship is essential to its business success and is important to the communities in which it works. This Environmental Protection Plan (EPP) has been developed in accordance with TSMC’s internal environmental policies and relevant legislation and guidelines.

An EPP represents one of the key documents required to support the overall environmental management of a project. EPP’s are cornerstones for implementing environmental protection measures and for providing documentation of environmental protection measures, against which performance can readily be assessed and the need for additional corrective measures can be determined, if appropriate. EPP’s typically undergo continuous revision to reflect new activities, work methods, environmental protection requirements and responsibilities. This EPP is structured to allow for such updates and revisions.

The present EPP can be used as a stand-alone document, or it can be used in conjunction with the Exploration EPP, Environmental Response Plan (ERP) or other management plans like waste, water, air and land management plans.

**1.1. Purpose**

The EPP serves as a tool in attaining TSMC’s goals and objectives in terms of environmental management. It can be used as a reference document during the planning and execution of the project, and as a field document to provide quick guidance to workers undertaking specific tasks outlined in the EPP. At the corporate level, the EPP serves as a working document to ensure that compliance with environmental policies and legislation have been achieved. The EPP may serve many purposes, including use as a reference document; a tool for documenting environmental concerns and appropriate protection measures that

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shall be in place; a guidance document to provide employees and contractors with concise and clear instructions to follow for different work tasks; to communicate program changes through the revision process; and as a reference to legislative, guideline and approval/permit requirements.

The EPP outlines the best protection measures (Sections 3.0 and 4.0) to follow while performing the general activities required during the operation of the site .Detailed procedures are outlined for specific aspects of the project (Appendix A).

## 1.2. Organization of the EPP

The EPP contains clear instructions to ensure that the personnel understands and implements environmental protection measures for both routine activities and unplanned events associated with the DSO Project activities. The style and format of the EPP is intended to be user friendly for workers in the field, as well as those wishing to revise or expand the EPP.

The main body of the EPP is meant to be an overview document, outlining the general protection measures to be followed, activities associated with the construction, development and operation of the mining site, and the site-specific measures associated with each location during the operation phase of the DSO 3/ DSO 4 Project. The bulk content of the EPP is contained in the appendices. The different sections of the EPP may be considered as stand-alone, separate documents outlining the general protection measures and separate contingency plans.

The **Preface** provides guidelines for making revisions to this document, as well as a source for document control records.

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**Section 1.0** is an introduction to the EPP, including the main purpose and its organization as well as outlining the responsible authorities for the EPP and mechanisms for EPP development and implementation.

**Section 2.0** provides a list of the permits and approvals required for the activities of the project. This section also outlines compliance monitoring requirements.

**Section 3.0** is an introduction and overview of the general activities anticipated during the operation phase. The environmental protection measures associated with these activities are provided in Appendix A. Section 3.0 contains some general principle on environmental procedures, hazardous waste materials, petroleum product storage and transport and potential discovery of contaminated soil. These stand-alone documents outline the operational considerations and environmental concerns to justify the need for these procedures.

**Section 4.0** describes the various work areas and site-specific environmental measures to apply to the operation phase of the DSO 3 / DSO 4 Project, and provides a listing of the general standard operating procedures (as presented in Appendix A) that apply. This section provides a way for managers and workers to use the EPP as a guide to the most appropriate procedures applicable to each work site. This section also contains information about local environmental sensitivities and periods that may apply.

**Sections 5 and 6** describe current environmental control plans and contingency plans.

**Section 7** is a summary of the contingency plan and is a stand-alone document.

### **Responsibilities and Authorities**

An organizational flow chart outlining environmental responsibilities of TSMC is presented in

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Figure 1.1.

It is the responsibility of the EPP holders to keep their copy up to date, and maintain records of all revisions received using the Revision Control Record. In this case, EPP holders are those that hold controlled copies of the EPP and are listed in the EPP Distribution Record (p.12-14).

For the DSO 3 / DSO 4 Project, EPP holders will consist of the Supervisors of the departments, the Health Safety & Security department (HSS), the Environmental department on site, the TSMC head office located in Montreal, and other designates that will be involved in EPP implementation and review. EPP holders must ensure that their personnel are aware of the EPP and any revisions.

### **1.3.1 Direct Supervisor and Mine Manager**

The Direct Supervisor of the work sites shall monitor activities on a daily basis. The Mine Manager will have the overall responsibility to make a decision to shut down a particular work activity if unsuitable environmental practices are being undertaken or if harm is being caused to the environment. This decision will be based on recommendations from the Supervisor. However, in the absence or unavailability of the Mine Manager, the Supervisor will be responsible to make a decision whether or not to shut down the work site. All work sites are to be inspected prior to physical activity by the Direct Supervisor.

### **1.3.2 HSE Committee of the Board**

The **Health, Safety and Environment (HSE) Committee of the Board**, will meet to discuss compliance and non-compliance events, as well as activities on-site. It is the responsibility of the HSE Committee of the Board to discuss compliance activities and suggest improvements. This Committee receives guidance from the **CEO and the Board of Directors** and is in charge

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of updating both the CEO and the Board of Directors about compliance activities. The CEO and the Board of Directors together will approve policies and plans prepared by **the Senior Manager - Environment and Permitting (SMEP)**, who will then relay the information to the Environmental Team. It will be the responsibility of the HSE Committee of the Board and the CEO to approve the different environmental policies and plans.

### 1.3.2.1 HSE Community Committee

The Community HSE Committee is composed of the five concerned Aboriginal groups who meet together with TSMC on a quarterly basis. With a view to supporting a holistic approach, the Committee acts as an avenue for meaningful exchanges between the groups on all matters relating to the communities health, safety and the environment as they pertain to TSMC's activities, planned works, impacts and mitigation measures. When deemed useful, guests are invited to participate, including Elders and other experts, in order to seek and integrate expert advice into day- to-day procedures and strategies. In addition to community and company experts in safety and the environment, community health and social services representatives will be invited to participate in meetings that address community health matters that might be linked to mining activities.

### 1.3.2.2 HSS Committee

The **Safety Manager** and **Safety Officer** compose the Health, Safety and Security (HSS) Committee. The HSS Committee coordinates the overall site's safety and emergency measures with the Environmental Team.

### 1.3.3 The Environmental Team

The **Senior Manager - Environment and Permitting (SMEP)** in collaboration with the on-site Environmental Team will provide overall direction and implementation of the EPP and will be

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responsible for the interpretation of regulations, permits and approvals. The Environmental Team will be responsible for the preparation of environmental policies and plans according to guidelines, regulations and legislation. The SMEP and site Environmental Coordinators will be the main holder of the EPP and will be responsible for reviewing and updating the EPP on a regular basis (at least annually).

The Manager of each department will perform inspections of work activities on a regular basis, while **Environmental Coordinators (EC)** of the on-site Environmental Team will ensure that this is completed. This is a means to monitor compliance with the EPP, to provide appropriate direction and ensure that non-compliance issues are dealt with appropriately. The results of inspections and follow-up activities will be kept on file. **EC's** in association with the **SMEP** will also be responsible for communicating results of environmental studies and compliance monitoring activities to the **Mining Superintendent (MS)** and **Operations Manager (OM)**, either directly or through designates. Among other responsibilities, the **MS/OM** must ensure that the EPP is communicated and available to all personnel.

The **SMEP** is in charge of implementing TSMC's environmental policy and performs regular audits. The **SMEP** is also in charge of governmental relations and permit applications. The **SMEP** is responsible to oversee all the environmental management for TSMC.

The on-site **ECs** are required to implement/assess the various environmental protection measures as stated in the EPP, regulations and permits/approvals, maintain information and write reports. Environmental protection measures as detailed in the EPP, regulations and permits/approvals will be communicated through the **ECs** during specific activities. The **ECs** will be also required to participate in monitoring activities, as well as conduct environmental audits.

The **Environmental Technician (ET)** in conjunction with **ECs** are responsible to perform all

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monitoring including data compilation of the site. He/She will support the **EC's** in technical aspects of the day-to-day operations, while also completing activities relating to waste management, water treatment, and composter operations.

The EPP is a reference tool that guides day-to-day construction activities and allows a quick response to unforeseen events that can arise during work.

### 1.3.4 Employees and Contractors

Employees and contractors will be responsible for overall EPP implementation, including complying with the protection measures relevant to their work and as outlined in legislation and in conditions of approvals and permits. EPP requirements will be communicated to employees and contractors during the site orientation. The site orientation will be specific to the work that the employees and contractors will be carrying out. It is the responsibility of TSMC to ensure that the employees and contractors receive the appropriate training in relation to the EPP.

Contractor responsibilities are clearly defined as follows:

- Ensures all activities performed takes into consideration the impact they may have on the environment according to the contractor's defined practices and procedures;
- Participates in reduction-at-source, recycling and material segregation activities required on-site;
- Ensures that during the construction period, all dangerous and hazardous wastes are managed as per contract. TSMC is not responsible for this management but will be performing audits to ensure it is managed properly;
- Informs the Environment Team of all activities which may have an impact on the environment;
- Ensures prompt reporting of all environmental incidents;

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- Implements information programs aimed at informing site personnel on environmental issues stemming from permit and regulatory requirements, as well as commitments made in the Environmental Impact Statement and TSMC's EPP;
- Appoints a liaison person to deal with all environment-related issues;
- Maintains emergency response equipment and trains personnel in a state of readiness in order to respond to an environmental incident or emergency (spill, fire, leak, explosion, accident, injury, etc.);
- Regularly inspects, maintains and documents activities and installations to ensure compliance with this EPP, internal (contractor) safety plans and applicable regulations, policies and best management practices in order reduce the risk of accidental or negligent spills, accidents and incidents;
- Proactively identifies, assesses and manages environmental hazards associated with the contractor's scope of work;
- Ensures that all applicable statutory acts, regulations and codes of practice are complied with;
- Implements the contractual requirements of their own procedures and work methods;
- Monitors the execution of their work scope to ensure the consistent application of environmentally protective work methods;
- Conducts and documents bi-weekly environmental inspections of identified areas (i.e. fuel storage, waste handling, wildlife interaction, run-off areas etc.);
- Analyzes their work with a document provided by the HSS department to identify and assess security and environmental hazards to provide for the development of acceptable work methods;
- Provides skills and other relevant training in a structured and documented manner, for all

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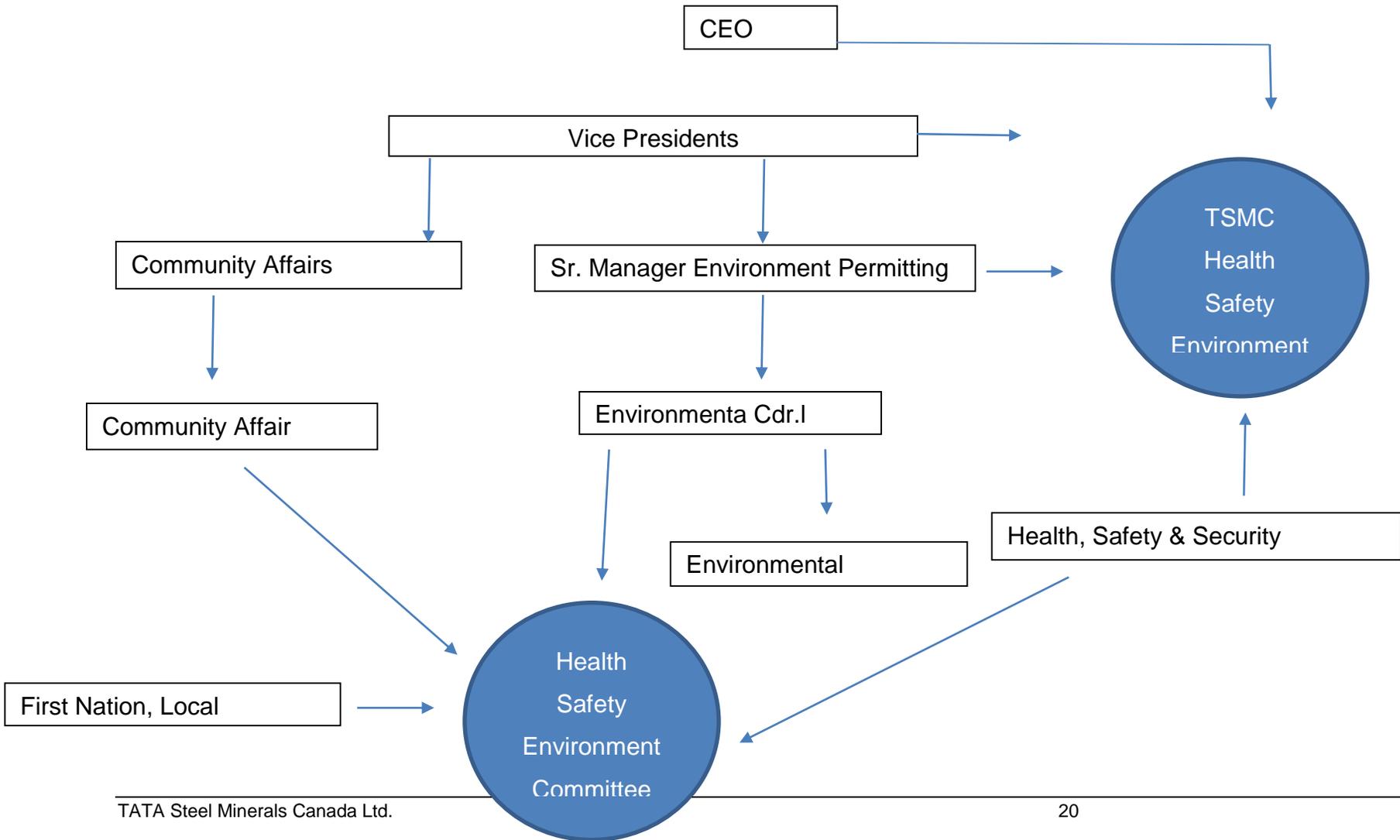
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personnel for whom the contractor is responsible;

- Ensures that all personnel are supplied with the appropriate tools for the job and the correct personal protective equipment and clothing;
- Maintains, updates and audits the MSDS register;
- Completes and provides a copy of the product MSDS to the TSMC HSE office, and completes the required paperwork to access sites with potential hazardous materials; and
- Audits and inspects the work site to correct non-compliance and identify improvements to active work methods.

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**Figure 1.1: Organizational Chart outlining Environmental Responsibilities**



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#### 1.4 Corporate Environmental Policy

TSMC's primary environmental concerns are human health, environmental awareness and conservation of plants, wildlife and water courses. The company recognizes that project operations can have a direct effect on the environment. TSMC commits to conduct its operations responsibly so as to minimize and eliminate, where possible, these effects on the environment. All employees, including contractors, shall follow safe and efficient practices to control environmental damage above, below, or at the surface during all operations.

The objectives in implementing the Environmental Policy are:

1. Ensure legislative and permit requirements are met in all phases of the project;
2. Prevent environmental hazards from developing;
3. Protect the health and safety of the general public and project personnel;
4. Minimize waste generation and disposal;
5. Minimize energy consumption;
6. Comply with standards, regulations, and industry best practices, as well as with implementation of appropriate technologies;
7. Carry out design and construction activities according to sound management principles while using equipment under proper operating conditions;
8. Involve all persons on site as stakeholders in performing the work in an environmentally sustainable manner;
9. Ensure open communications with the community on environmental issues;
10. Implement means of supervising and monitoring environmental hazards, along with means of preventing or resolving incidents that could pose hazards to health or the

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environment; and

11. Ensure continued improvement through lessons learned both on and off-site.

### 1.4.1 Performance Standards

TSMC is committed to the protection of the environment by ensuring:

1. Employees, including contractors, will be made aware of the company's commitment to environmental policies and contractually obliged to respect and to implement them;
2. Disposal and safe handling of all hazardous material;
3. Safe and efficient fuel handling and storage; and
4. Access to sites, particularly streams, will be done in such a manner as to minimize impacts to the surrounding environment.

## 1.5 EPP Development and Implementation

This EPP focuses on the activities occurring during the operation phase of the DSO3/DSO4 2(a) and 2(b). The EPP is structured in such a way that revisions and additions to the document will require minimal effort to allow changes as work progresses.

To effectively manage and implement the EPP, several mechanisms have been identified, which includes adequate communication with environmental personnel and other personnel on-site, environmental performance reviews (annually), environmental orientation, regular job hazard analyses and tool box meetings which incorporate environmental issues.

### 1.5.1 Environmental Performance, EPP Review and Update

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At the end of each calendar year, an environmental performance review workshop will be conducted to discuss environmental issues encountered and mitigation measures implemented. The workshop will allow a review of the previous year's activities and provide an opportunity to ensure the EPP is relevant and up to date. This environmental performance review will precede a comprehensive review and update of the EPP by the EC/SMEP. In the event of a change in work activities, legislation or the terms and conditions of permits and approvals, specific sections of the EPP will be reviewed and updated as necessary by the EC/SMEP.

Note that the EPP is an official document and shall be submitted after major revision or at least every year to the Newfoundland and Labrador (NL) Department of Environment and Conservation.

To ensure all employees and contractors on-site are aware of the EPP, all calls for bids will contain a copy of the EPP as an appendix. Upon award of a contract, a shortened copy of the EPP that is up to date will be released to the successful bidder.

A site orientation is developed for the DSO3 / DSO4 (2a and 2b) Project, and will be presented to all employees and/or contractors prior to working on the operation phase of the Project. This orientation will outline all the requirements for working on-site in a safe and environmentally friendly manner. This orientation will also outline specific aspects of the EPP (e.g., wildlife encounters, waste disposal, spill reporting, and emergency response), an overview of HSE policies, roles and responsibilities, emergency reporting, and particular sensitive environmental features on-site. Orientation training sessions will be documented, and filed with the HSE department for reference. Information to be recorded will include at the minimum attendee names, dates and general overview of the information presented.

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In addition to this orientation session, all individuals are expected to read and understand the EPP and comply with its provisions. In order to track awareness of the EPP, and to ensure that the EPP will be implemented, a Sign-off Sheet (Appendix C) will be utilized. TSMC will ensure that all personnel on-site, including contractors, have appropriate training with regards to environment and safety (e.g., spill response, first aid).

**1.5.2 Contractor training**

1. Contractors will provide on-going training programs and will send staff to regular refresher courses as required by standard industry best management practices and applicable regulations;
2. Contractors will train employees on the hazards, precautions and procedures for the safe storage, handling and use of all potentially harmful materials relevant to each employee's task and work area;
3. Contractors will train their personnel in environmental, and health and safety matters including accident prevention, personal protective equipment, safe chemical handling practices, proper use and maintenance of equipment and facilities, and personal behavior (recycling, housekeeping, etc.);
4. Contractors will ensure that training also includes emergency response, including the location and proper use of emergency equipment, use of personal protective equipment, procedures for sounding the alarm and notifying emergency response teams, and proper response actions for reasonably foreseeable emergency situations; and
5. Contractors will maintain up-to-date documentation describing which staff members have received which type of training, and when the training expires.

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### 1.5.3 Special Training

In some specific areas, special training may be required depending on the task or activity being performed. With respect to specific areas, **Section 4.0** lays out procedures, training, equipment, and sensitive areas particular to each of the DSOT project's operational areas.

### 1.5.4 Job Hazard Analyses and Tool Box Meetings

Prior to a work crew undertaking a new task or activity, TSMC will require that all staff and contractors complete a job hazard analysis. This job hazard analysis shall provide an overview of the specific tasks to be conducted in an attempt to identify any potential safety or environmental issues that may be encountered. It is the responsibility of the Safety Officers to ensure these job hazard analysis forms are administered to the appropriate personnel as part of the OH&S Program, and to ensure they are received and filed in the HSS Department following completion. The direct Supervisor will undertake the job hazard analysis, with input from employees. This job hazard analysis will be followed by regular HSE tool box meetings.

Toolbox meetings are short meetings that are held with work crews and supervisors at the beginning of each work shift. The topics usually discussed are the work tasks for the shift and the safety and environmental concerns or hazards associated with each task. Such meetings also provide the opportunity to discuss any environmental issues and potential mitigation measures associated with each work task.

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**2.0. Project Overview**

The DSO- Project is subdivided into DSO1, DSO 2, DSO 3 and DSO4. Figure 1-2 presents the various subdivision of the DSO Project. Currently, TSMC has no plan to develop DSO 1. For DSO 2, exploration is planned between 2014 and 2016. Therefore, this EPP does not take into consideration these subdivisions of the project.

The Howse deposit, owned by Howse Minerals Canada and Labrador Iron Mines, located in the vicinity of the DSO Project will be operated by TSMC; at this stage the project is in the environmental impact process and may be developed at a later date; this project will be include in the EPP in a near future.

**Table 1: DSO description**

DSO3 ( NL) – 1a	DSO3 ( Qc) – 1b	DOS4 – 2b ( NL) 2015	DSO4 2a ( Qc)
2012	Not to be mined	2015	2016
Timmins 3N,4,7	Ferriman 4 ( not in mining plan )	Kivivic 1c,2,3N,4,5	Sunny 1
Fleming 7 N		Timmins 8 ( no to be mined)	Goodwood
			Kivivic 3 S
			Leroy 1s

**2.1. DSO 3**

DSO 3 is often referred to as Project 1a (portion located in Province of Newfoundland and Labrador (NL) and Project 1b (portion located in the Province of Québec). The DSO 3 Project 1a (only one of the total DSO3 project in operation) is registered in NL & Labrador province as Elross Lake Iron Ore Mine (ELAOM) project.

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This project is located in the province of Newfoundland and Labrador, approximately 20 km north-west of Schefferville, Québec with exception of a small portion of the Fleming 7 pit estimated to 3%.

DSO 3 contains all infrastructures of the DSO TSMC project: processing plant, rail loop track, camp, fuel farm, batch plant, landfill and maintenance areas. The area of DSO 3 had been previously impacted by mining activities and infrastructure between 1954 and 1982. The operation phase started in 2012 and will entail mining over the following sequence:

- Timmins 4 : 2012 to 2015
- Fleming 7N: planned for 2013 to 2016
- Timmins 7: planned for 2015
- Timmins 3N: planned for the end of the project life

Ore from the project will be transported to the crushing facility or plant complex and transported to the Port of Sept-Îles via rail. A dryer is located at the crushing facility and will be in operation on spring 2015 in order to process the ore from Fleming 7 only. Starting spring 2015, the rest of the ore will be sent to the wet circuit of the processing plant.

Starting in June 2015, the run-of-mine ore will be crushed, washed, screened and (in winter) dried in a processing complex at DSO 3, in NL. The DSO product will then be shipped to the Port of Sept-Îles, Québec by rail. At this stage the targeted date of operation of the processing plant is spring 2015. Operations will start in spring 2015.

The principal infrastructures all of which will be located in Labrador are:

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- A processing complex which will be contained in a dome, including sizers, crushers, physical and magnetic separation equipment, boiler, dryer, conveyors, pumps and piping;
- A screening facility named plant 2 including a dryer;
- A temporary maintenance area. Maintenance area with wash bay will be built during 2015.
- A tailings deposition system which will deposit tailings into Timmins 2 as per the tailings deposition plan.
- Two sedimentation basins connected to Timmins 1 by a culvert for pit dewatering and runoff management;
- One sedimentation pond with overflow to Goodream Creek for Timmins 4 pit dewatering and runoff management;
- Two real-time water monitoring station at Goodream and Elross Creek managed by Environment Canada and NL water division;
- Sinter Fines (SF) and Super Fines (SPF) stockpiles;
- A yard track and a railcar-loading system; LOOP
- A camp to accommodate up to 300 workers;
- A wastewater and sewage treatment plant;
- Offices, warehouse, workshops, garages, laboratory, mine dispatch, mine dry administration offices and other service buildings;
- An upgrade to an existing access road from Schefferville;
- Site and haul roads;
- Landfill for solid waste disposal;

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- A fuel farm and associated reservoirs and temporary reservoirs at temporary crushing and screening facility and at the dry plant;
- 4 generators at the camp (3 generators of 275 kW (Caterpillar 275 ekW) and one generator of 1020 kW (Kohler 1000REOZMB)
- 1 generator of 157.5 kW (Caterpillar 157.5 ekW) at the batch plant as approved by GNL Certificate of Approval No. AA11-125566A released in February 2013;
- 2 generators of 1935 kW (MTU DP1935D6SRW) respectively at the Temporary crushing facility (Plant 2) and Temporary crushing/sizing facility (Plant 1) as approved by GNL certificate of Approval AA11-12556A
- 5 gensets of 2 Mw for the permanent processing facility.
- 1 generator of 1935 kW (MTU DP1935D6SRW) at the administration building

The four pits of the DSO 3 area and the infrastructures will occupy approximately 94 ha, some 46 % of which has already been disturbed due to past operations. The layout of the proposed infrastructure is outlined in Figure 1-2.

**Figure 1.2 Layout of DSO 3 Infrastructure**

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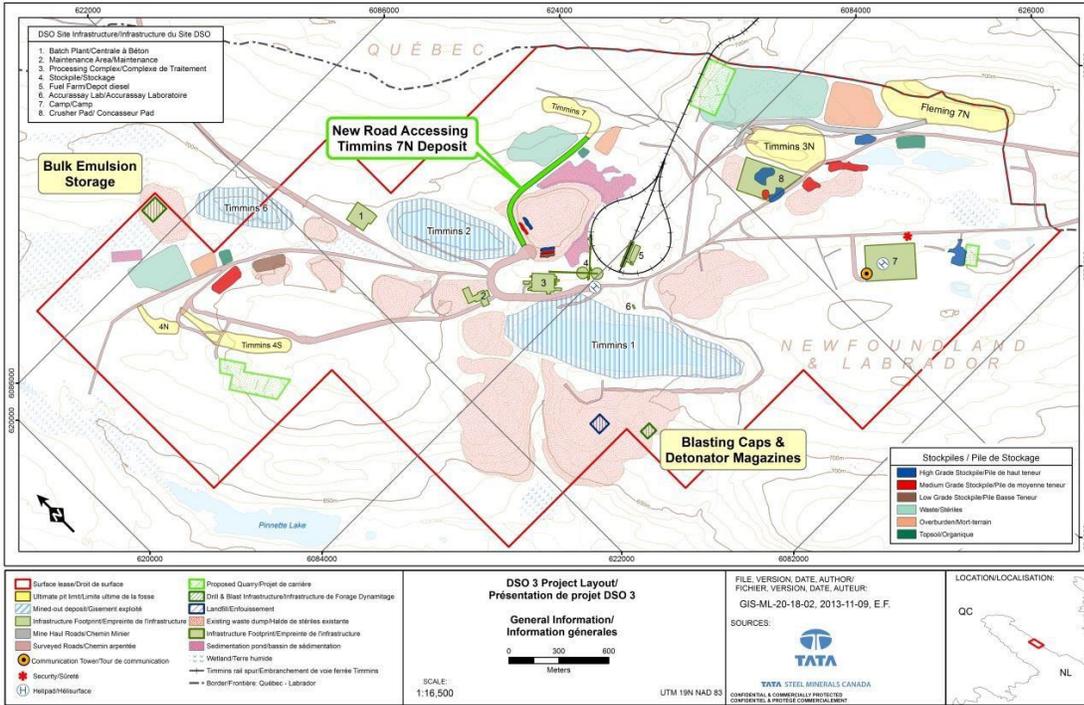
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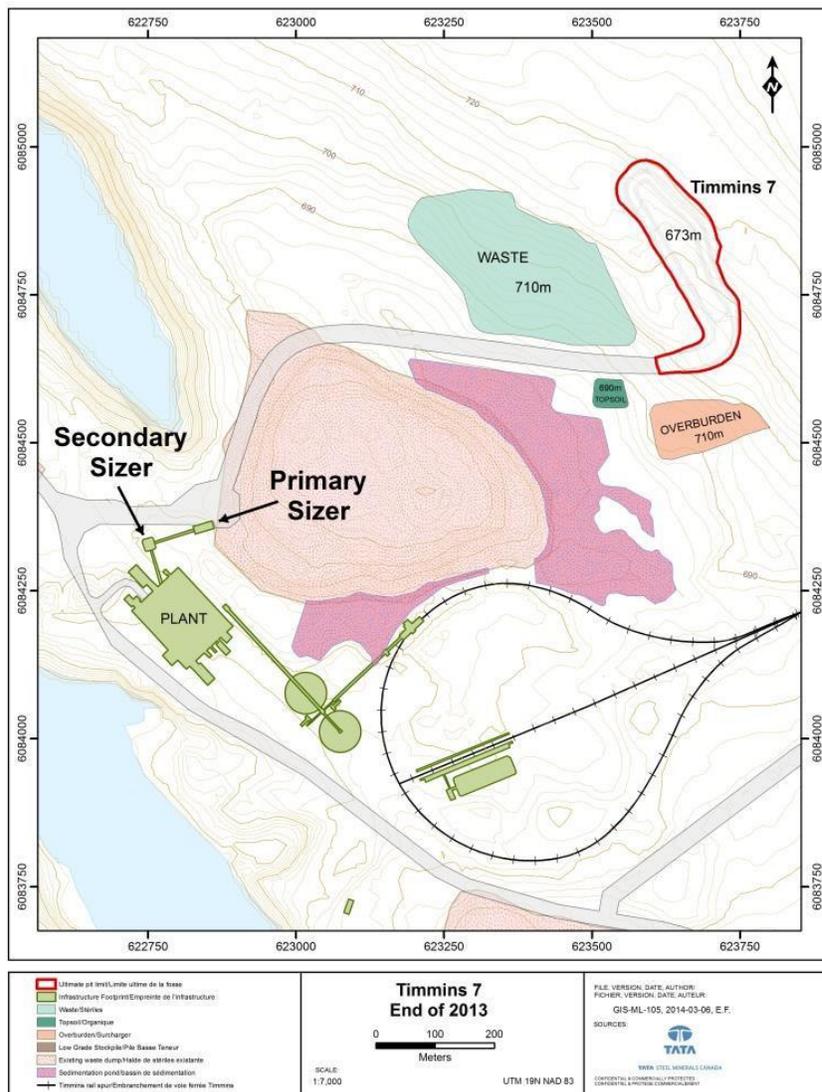
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Figure 1-3 Primary and Secondary Sizers of processing plant



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**2.1.1. Sensitive Areas**

**Timmins 1 Pit:** Fish habitat as defined in the Fisheries Act and a water quality sampling station.

**Elross Creek:** Fish habitat as defined in the Fisheries Act and a water quality sampling station.

**Goodream Creek:** Body of water as defined in the Water Resources Act; probable fish habitat and a water quality sampling station, actual Federal/Provincial Real Time Monitoring Station.

**Pinette Lake:** Recreational value for the Aboriginal People of the area with federal designation as fish habitat.

**Pond SE of Camp area:** Body of water as defined in the Water Resources Act and water quality sampling station.

Wetland/Ponds straddling the main access road east of the plant: Wetland/Body of water as defined in the Water Resources Act.

**Irony Mountain:** Cultural and historical value for the local communities and Aboriginal People (especially Innu People). Irony mountain is located approximately 3 Km from the camp area, and 1.5 Km from the DSOT Process plant.

**2.2. DSO 4**

DSO 4 is often referred to as DSO 4 Project 2a (portion located in the Province of Québec north of 55°N) and DSO 4 Project 2b (portion located in the PNL).

**2.2.1. DSO 4 Project 2b also known as Kivivic area or Joan Lake Project**

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Construction and development in this area is planned for 2015. The development of DSO 4 (2b) will not consist of permanent infrastructures; mining operation offices and dining room will be located in trailers with a temporary septic tank toilet facility. However, more permanent infrastructures on-site will consist of:

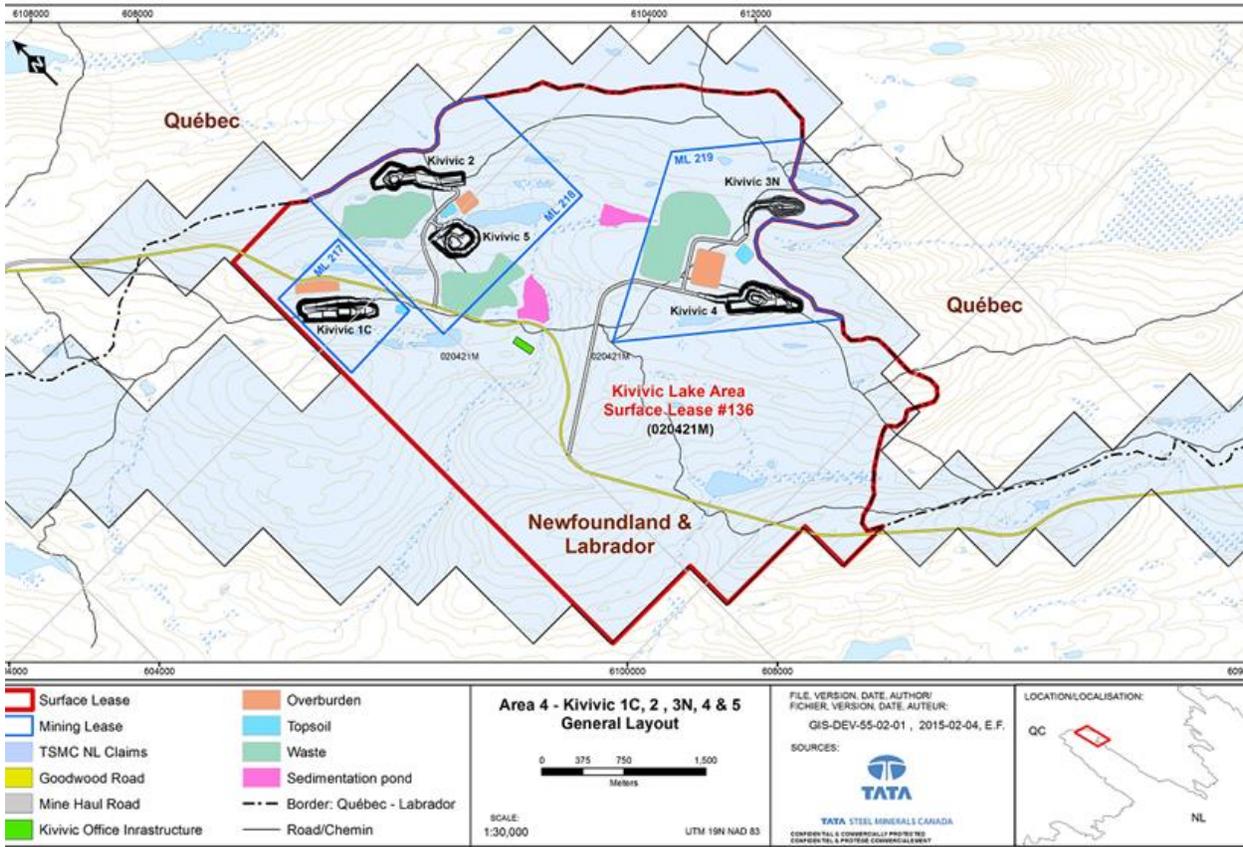
- A real-time water monitoring station managed by Environment Canada and NL government Water Resource Management Division;
- Sedimentation ponds; and
- Mining infrastructures

**2.2.1.1. Sensitive areas – 2b – Kivivic**

**Joan Brook and Joan Lake:** Fish habitat as defined in the Fisheries Act and a water quality sampling station.

**Foggy Lake:** Fish habitat as defined in the Fisheries Act.

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**Figure 2.2. Kivivic area**

**2.2.2. DSO 4 Project 2a also known as Goodwood and Sunny Operations**

In January 2012, Québec government and the Kativic commission granted the environmental release with 20 conditions. Mining operation in this area is scheduled for spring 2018; in 2015, it is planned to only do an environmental monitoring assessment to confirm the baseline studies from the provincial EIS.

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**2.2.2. Sensitive Areas Goodwood and sunny**

**Goodwood Lake:** Fish habitat as defined in the Fisheries Act and a water quality sampling station

**Little Goodwood Lake:** Fish habitat as defined in the Fisheries Act and a water quality sampling station The mining road between DSO3 and DSO4,

**La Potardière** stream was identified by Québec government in 2013 as a sensitive area. Engineering work is in progress to assess environmentally sensitive areas on this road. Caribou and the Rusty Blackbird are also subject to protective measures described in Section 5.6 and 5.7.

**3.0. Permits, approvals, and compliance monitoring**

**3.1. Permits and Approvals**

Due to the sensitivity and the localization of the project, the permit team needs to be advised and informed of all changes in the project or schedule before any work construction or operation.

Three different governments are involved in the project: Newfoundland & Labrador, Québec and Canada (Department of Fisheries and Ocean, Environment Canada and Transport Canada). A series of certificates of approval are required before the start of the project. The general permits are defined as the following:

- Mining development and closure plan;

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- Operation permit;
- Construction permit;
- Specific permits ex.: yard construction, fuel farm construction, road construction, quarries, etc.
- Federal permit for work in water body, explosive and blasting.

On March 7th, 2012 environmental clearance was obtained for projects 1a, 1b with a series of conditions. Major construction permits were granted for camp and plant construction; operation permits were granted for Fleming 7 and Timmins 4. On January 2013 Environmental clearance was obtained for the project 2a. Some areas need special agreement with both QC and NL government:

- Fleming 7 (NL mining and QC waste rock removal)
- Kivivic 3 pit is in both NL and QC province
- Mining junction road between DSO3 and DSO4

In addition to the permits, TSMC shall comply with all other regulation (Water Act, hazardous product regulation in Québec, NL and Canada). A list of granted permits and potential required permits is presented in Appendix D-1. These permits are available in Montreal, Quebec with the Senior Manager, Environment and Permitting with duplicates available on-site with the Environmental Coordinators, with electronic copies available in secure cloud storage.

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**3.2. Application for Additional Permits – Work in Water**

**3.2.1. Culverts**

A Culvert Approval will be required from the Newfoundland and Labrador Department of Environment and Conservation (NLDEC) to replace or install new culverts. The application consists of the main application form and Schedule A.

<http://www.env.gov.nl.ca/env/waterres/regulations/appforms/>

Culverts must be installed in accordance with the Newfoundland Government’s Environmental Guidelines for Culverts (Chapter 5) and Environmental Guidelines for Watercourse Crossings (Chapter 3).

In the case of confirmed or potential fish habitat, bottomless arch culverts will be used to avoid disturbance to fish habitat. The following protection measures will also be followed:

- The culverts used shall be sized to handle the 1-in-25 year return period flood, with a minimum diameter of 1000 mm;
- Fish passage will be maintained at all times;
- The depth of the water shall be no more than 85% of the culverts’ vertical clearance;
- In multiple culvert installations, one culvert shall be installed at an elevation lower than the others;
- Culverts must not disrupt natural flow of water or cause ponding at the upstream side of the installation;

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- Riprap, filter stone or concrete headwalls will be placed near inlet and outlet areas to prevent erosion;
- Culverts of sufficient length will be used to extend beyond the toe of the fill material;
- Backfill material which is of a texture that will support the culvert and limit seepage and subsequent washing out shall be used. Flow velocity of the stream must be considered when choosing particle size for backfill;
- Infilling or reduction of the natural cross-sectional area of the watercourse is prohibited;
- Fill material shall not be removed from streambeds or banks except where removal of material is necessary to ensure a foundation for installing a culvert;
- As required, cofferdams of non-erodible material shall be installed above and below work areas to separate them from the watercourse when excavating for culverts and footings;
- Cofferdams shall be removed upon completion of construction and the streambed returned as closely as possible to its original condition;
- Water pumped from work areas or other runoff must have silt and turbidity removed by settling ponds, filtration or other suitable means before discharging to a water body; and
- Maintenance and replacement of culverts will be conducted in accordance to the requirements of DFO.

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**3.2.2. Fording**

Before temporary (one time only) fording of any watercourse, the National Operating Statement for Temporary Fording Sites will be consulted (<http://www.nfl.dfo-mpo.gc.ca/e0005517>). If the fording event is not a onetime event, a notice will be sent for approval to the DFO Area Habitat Biologist for a Letter of Advice.

A Fording Approval will be required from the NLDEC. The application consists of the main application form and Schedule D (<http://www.env.gov.nl.ca/env/waterres/regulations/appforms/>). The contractor will follow Newfoundland’s Environmental Guidelines for Fording (Chapter 6) found with the application form and the guidelines outlined in DFO’s In-stream Work in the Dry - Cofferdams (<http://www.nfl.dfo-mpo.gc.ca/e0005523>):

1. Where feasible, crossings shall be restricted to a single location and shall be perpendicular to the watercourse where the streambed is not erodible;
2. Equipment shall be clean and mechanically sound to avoid the introduction of oil, gasoline and hydraulic fluids to water bodies;
3. No servicing or washing of heavy equipment shall occur adjacent to watercourses;
4. Temporary fuelling, servicing or washing of equipment in areas other than the main fuel storage site shall not be allowed within 100 m of a watercourse except within a refueling site which has been already approved;
5. The entire fording area shall be stabilized using vegetation mats, corduroy roads or coarse material (125 mm diameter or greater) when such material is available from a reasonably close location within the right-of-way, and the ford area is not natural bedrock and is easily disturbed by fording;

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6. Fording shall not decrease the depth of the watercourses to less than 20 cm; where the existing depth is less than 20 cm, that depth shall be maintained;
7. Watercourses may not be forded during high flow periods; and
8. All bank sections which contain loose or erodible materials shall be stabilized or avoided if possible. If banks must be sloped for stabilization, no material shall be deposited within the watercourse; sloping shall be accomplished by back-blading and the material removed shall be deposited above the high water mark of the watercourse.

### 3.2.3. Bridges

A Bridge Approval will be required from the NLDEC. The application consists of the main application form and Schedule B

(<http://www.env.gov.nl.ca/env/waterres/regulations/appforms/>). The contractor will follow Newfoundland's Environmental Guidelines for Bridges (Chapter 4) found with the application. The following protection procedures will be applied:

1. To safely convey peak flows, bridges will be designed for a 25-year return period stream flow;
2. Bridge abutments and their footings will be set above the high water mark of the watercourse to prevent constriction during high flow conditions;
3. The upstream and downstream sides of abutments will be protected with riprap, concrete or heavy timber to prevent erosion and scouring;
4. Roadside embankments near the watercourse will be adequately protected from erosion by sodding, seeding or placing of riprap;

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5. Abutments and piers will be constructed in dry weather and during times of low flow;
6. Concrete formwork will be constructed to prevent any fresh concrete from entering bodies of water.
7. Dumping of concrete or washing of tools and equipment in any body of water is prohibited;
8. Wood preservatives will not be used for bridgework; and
9. All areas affected will be returned to a state that resembles local natural conditions.

NOTE: when installing culverts or bridges in bodies of water that contain fish, provision must be made to permit fish passage through or around the installation.

### 3.3. Compliance Monitoring

Compliance monitoring is required during any project to ensure that applicable requirements as laid out in the legislation, permits and approvals have been met. Compliance monitoring also ensures that commitments made during the environmental assessment process have been respected. For additional information, refer to the summary of Environmental Monitoring

1. Compliance monitoring requirements will entail the following monitoring activities:
2. Air quality monitoring;
3. Noise monitoring;

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4. Water quality monitoring including groundwater and surface water;
5. Vegetation and wildlife monitoring;
6. Protected species monitoring;
7. Waste and raw materials monitoring including fuel and chemical; and
8. Incidents and complaints monitoring.

Additional regulatory compliance monitoring may be stipulated in the conditions of permits and approvals and will be outlined in this section when received. The following sections provide an outline of the compliance monitoring activities. Terms and conditions of the specific permits and approvals will be provided in Appendix D-2.

### 3.3.1. Air quality monitoring

Air Quality Monitoring shall be divided into two categories; atmospheric (outside) Air Quality (Measured for TPM, PM10, PM2.5, Dustfall, NO2, and Metals), and Indoor Air Quality (Measured for CO, NO2, CH4, and CO). The DSOT site silica management plan will cover both indoor and atmospheric (outdoor) areas.

For atmospheric Air Quality;

- Air monitoring stations will be in place in Kivivic, Goodwood, and Sunny areas before 2a (Goodwood and Sunny ) operation including air monitoring in the vicinity of Timmins 3, 7, and 4, Flemming 7 and 3, and Howse;
- Environmental Team will conduct regular visual inspections for evidence of excessive dust or excessive emissions;
- Annual air emission reporting (NPRI federal program)

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For Indoor (Dome/process plant) Air Quality;

- TSMC and major contractors during construction phase will have real-time 24-hour monitoring of NO<sub>2</sub>, CH<sub>4</sub>, O<sub>2</sub>, and CO through a series of personal monitors assigned daily to workers in different areas of the dome performing different tasks, with all data being logged and distributed on a daily basis.
- TSMC will develop an emissions control plan with respect to indoor air emissions.

The TSMC silica management plan will dictate monitoring requirements and required actions in respect of the Newfoundland and Labrador Silica Code of Practice. Regular monitoring will occur at quarterly intervals, with TSMC staff conducting supplementary monitoring campaigns internally to augment the mandated quarterly monitoring. Monitoring campaigns to cover the process plant (indoor), equipment operators, operations staff working on Plants 1 and 2, haul truck operators, and drill and blasting staff across all DSO3 and DSO4 areas.

**3.3.2. Noise Monitoring**

Noise at the workers' camp will be monitored on a monthly basis; as well the noise by the generator fitted with the energy-recovery system will be monitored during the first days that it is in operation. A record of blasting data will include vibration speed, ground vibration frequency, air pressure, and dynamiting patterns. Noise will be monitored on a weekly basis in all DSO3 and DSO4 work areas, including the process plant.

**3.3.3. Surface water quality monitoring**

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Surface water quality will be monitored periodically (weekly and four times per calendar year), and will be tested for the following water quality parameters: temperature, pH, conductivity, dissolved oxygen, turbidity, anions, nutrients, and previously analyzed metals;

- Monitoring on DSO3 1a will be conducted at: Timmins 1 and 2, T4 sedimentation pond, sedimentation ponds 1 & 2, Elross Creek, Goodream Creek, Pinette Lake, and the unnamed pond south of camp;
- Monitoring on DSO4 2b will be conducted at both East and West sedimentation ponds and at the outlet of Joan Lake;
- Monitoring points will be added when required as other projects are developed;
- Long-term effect study for Goodream and Elross Creek as required by the MMER (Canada mining regulation);
- Ongoing monitoring as required for Timmins 1 including monthly surveys of water surface levels.

Two real-time water quality/quantity monitoring stations have been established, one on Elross Creek (just below the confluence where all tributaries from in and around mining operations meet) and one in Goodream (in the stream coming from Timmins 6). These stations provide near real-time water quality and quantity data and ensure emerging issues are caught and mitigation measures implemented in a timely manner thus minimizing the impact to the Elross Lake system. A real-time water quality monitoring station will be added to the Joan Brook area in 2015 as DSO4 becomes operational.

**3.3.4. Groundwater monitoring**

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Quarterly groundwater monitoring will occur on-site in accordance with the issued Certificate of Operation AA12-085571A, requiring monitoring of 8 wells four times per year at least 30 days apart for a full range of General parameters and Metals.

**3.3.5. Potable water monitoring**

1. Daily potable water consumption;
2. Daily pH values at the water treatment system;
3. Daily chlorine residual values at the water treatment system;
4. Water quality of the tap water after treatment at the camp and at the plant: monthly bacteriological analysis, quarterly trihalomethanes analysis and semi-annual analysis for standard parameters outlined under the *Guidelines for Canadian Drinking Water Quality 6th Edition, 1996*;
5. Water quality before treatment: semi-annual analysis for standard parameters outlined under the *Guidelines for Canadian Drinking Water Quality 6th Edition, 1996*.

**3.3.6. Sewage**

Volume of treated effluent discharged in the environment will be monitored daily; Quality of the effluent after treatment will be monitored monthly. Parameters not meeting criteria will be re-analyzed in the course of the month, solid waste (septic sludge) volumes and disposal will be monitored

**3.3.7. Waste**

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1. Hazardous waste volume
2. Composter efficiency and compost volume
3. Landfill management report
4. Recycling program performance

**3.3.8. Bird (especially Rusty Blackbird) Monitoring**

Surveys will be conducted every three years, after the start of the operations phase, to monitor potential effects on at risk or migratory bird species. If effects are identified and can be attributed to the DSO-Timmins Project / Goodwood Deposit Project, mitigation or compensatory measures will be discussed with the Wildlife Division of NLDEC, and other appropriate government agencies.

**3.3.9. Fish and Fish Habitat Monitoring**

. Analyses of the long-term effects as required by the mining regulation of Canada. Results will be discussed with NL government and Environment Canada. Monitoring program will be adjusted accordingly an integrated with requirements for Elross and Pinette lakes in accordance with Environment Canada recommendations. Following blasting activities, visual inspection of nearby watercourses (i.e., Pinette Lake, Joan brook) will ensure no post- blasting fish mortality has occurred. According to plans, blasting activities during operations are not expected to result in fish mortality.

**3.3.10. Harvested Mammals and Wolverine Monitoring**

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Hunting and trapping success by the local First Nation groups will be monitored every five years to ensure that there are no effects on the harvested mammals. Wolverines (a protected species) are assumed to be rare or absent within the Project area. To test this prediction, baited posts will be set up and monitored every five years within a 50 km radius of the site.

**3.3.11. Caribou Monitoring**

Helicopter-based surveys have been completed prior to 2013 in accordance with Government of Newfoundland requirements. TSMC is a partner in the Ungava Project, a project championed by Laval University to monitor the concentration of Caribou in the area of the project and northern Quebec in General.

**Migratory Caribou Monitoring**

Migratory caribou will be monitored via radio satellite collars, and the on-site Environmental specialist / permitting manager will be notified when caribou are within 100 km of the DSO3/4 project site.

The following monitoring measures will be employed:

1. Within 100km - activities will continue with caution; and
2. Within 20 km - ground level surveys may be initiated from fixed points or via snowmobile and ATVs by trained local First Nation monitors employed by TSMC. If this is not feasible, aerial surveys will be employed during snow covered conditions.

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**Sedentary Caribou Monitoring**

Sedentary Caribou will be monitored on site through regular site inspections and employee information sessions. Should a sedentary caribou be detected in the vicinity of the DSO Timmins project, the animal’s location and direction should be noted and monitored.

**3.3.12. Complaints and Incidents monitoring**

All contractors and staff on the DSOT site are required to report all environmental incidents within 30 minutes to the on-site environmental representative. All clean-up is the responsibility of the party in question under the supervision of TSMC Environment staff. A full report with all details of the incident is required within 24 hours of the incident’s occurrence, with TSMC environment handling all government reporting requirements within the same timeframe. All complaints should be directed to TSMC Environment under the same format to allow for timely resolution.

**4.0 Site-Specific Environmental Protection Measures**

Major components of the DSO-Timmins Project / Goodwood Deposit Project operation phase include those associated with the camp area (including the sewage and wastewater plant), the processing complex which will be contained in a dome, a warehouse, a maintenance garage, laydown areas, a refueling area and an administration building, the mine site (including open pits, waste rock and overburden piles), railway, tailings and tailings/effluent pipelines, and the access and site roads.

**4.1 Camp Area**

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The permanent workers' camp will be composed of seven dormitories: 2 dorms of 50 workers each, 3 dorms of 25 workers, and 2 of 17 workers with a kitchen/dining area and a temporary office. The camp will occupy 15,976 m<sup>2</sup> and will partially be heated by a diesel-fired hot-air unit. A parking area will have spaces for some 20 vehicles, each with a power outlet for use in winter. The camp area also includes 2 sewage and wastewater unit call MBR and one potable water treatment. The power will be provided by 5 generators. See figure 4-2.

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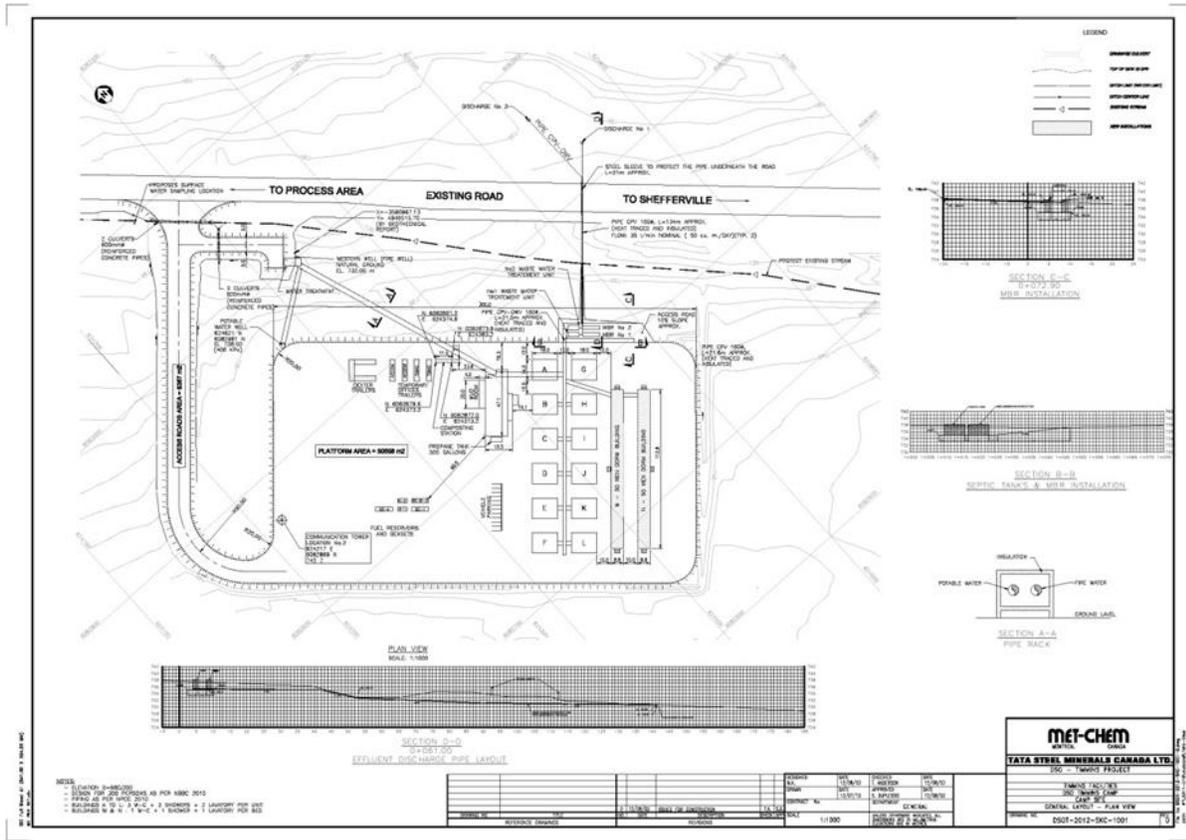


Figure 4.2. DSO 3 Camp Infrastructures

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#### 4.1.1 Applicable Procedures

The following activities and the associated environmental protection measures are relevant to the Camp Area:

- A-1: Storage, Handling and Transfer of Fuel.
- A-2: Storage, Handling and Transfer of Hazardous Materials
- A-5: Solid Waste Disposal
- A-6: Wastewater and Sewage Disposal
- A-7: Water Supply
- A-8: Dust Control
- A-9: Noise Control
- A-11: Pumps and Generators
- A-12: Equipment/Vehicular Maintenance
- A-13: Vehicular Traffic
- A-14: Road Maintenance
- A-27: Incident and Complaint

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- A-25: Snow Removal
- A-29: Bear Management
- A-32: Potable Water

These environmental protection measures are presented in Appendix A.

#### 4.1.1. Site Specific Measures

Camp was identified a risk receptor during the operation of Timmins 3 N. an air monitoring system will be install prior to Timmins 3 N operation at the camp. Run-off from the camp area will be captured through perimeter ditches and will be directed towards the ditch along the access road by-pass and slowly infiltrate to the ground. Disposal of solid waste shall be in accordance with the Waste Management Plan (Appendix E). Wastes at the camp site shall be separated by type, and include different types of recyclable material (e.g., plastics, cardboard and batteries), compostable material, and garbage.

- Compostable system is operational at the camp.
- Waste water treatment unit operation
- Wildlife management and safety (Bears, wolf...)
- Sewage Monitoring
- Potable Water Monitoring
- Noise

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**4.1.3 Sensitive Areas and Periods**

Any bears encountered in the TSMC Camp complex may present a risk to human safety and should be dealt with in accordance with the TSMC bear management plan. All efforts should be made to ensure foodstuffs or waste are not left accessible to wildlife in an effort to deter their presence.

An unnamed lake exists to the west of the camp area, and is to be considered a sensitive area for the duration of the project. Under no circumstances are site staff to approach or interfere with this area.

**4.2. Processing Complex and Associated Buildings (Operations stage)**

The DSOT processing complex will be largely contained within a dome and will consist of six major processes; Sizing, Crushing, Separation, Concentration, Dewatering, Drying, and Loading. Before entering the dome, all material must pass through sizing and screening through Plant 1, located directly north of the dome. After entering the dome, the material will be separated, concentrated, and dewatered through the wet and dry circuits. Following this, material is dewatered and dried before exiting the dome via enclosed transfer conveyors to be loaded in rail cars.

For the purposes of this EPP, the processing complex also includes the maintenance facility and administration building. The maintenance facility will be used to repair and maintain the fleet of heavy equipment, mobile equipment, and light vehicles, while the administration building will serve as an administrative office for up to 100 staff. Due to the environmental risk and specific measure the tank farm and other fuel management

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description and procedure are detailed in a specific section.

Related infrastructure for the processing complex and associated buildings include the process water system, the tailings deposition system and barge, the potable water system, the sewage and wastewater system, and the oil/glycol system. The process water system withdraws from the Timmins 2 pit 200m adjacent for use with the wet circuit before returning it with to Timmins 2 laden with residual tailings from the tailings thickener. Tailings are deposited in Timmins 2 in accordance with our COA via a tailings pipeline, allowing this water to be used again in the process water system after settling. A dedicated potable water system in the dome supplies the process, administration, and maintenance facilities with potable water from three deep water wells located in the vicinity. A reverse-pressurized wastewater system collects all wastewater from the potable water system in underground reservoirs to allow for separation of solids, while liquid wastes are manually pumped to the DSOT camp facility for treatment in their dedicated MBR units. The processing facility will include a tailings disposition system and water uptake system from Timmins 2, which is better referenced in the stand-alone tailings management document.

The oil/glycol system associated with the processing complex is a plumbed system of four (4) reservoirs dedicated for maintenance of six (6) diesel generating units (DGU's) providing power to the process plant and camp facilities as well as the associated heat recovery units (HRU's). In this system, oil changes on the DGU's and glycol changes for the HRU's will be pumped too, and drained from, the respective reservoirs and stored for removal by an external party on a monthly basis.

This section is dedicated to the process plant during the operational phase of the

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project, beginning in summer 2015.

**4.2.1 Applicable Activities**

The following activities and the associated environmental protection measures are relevant at the processing complex during the operations period.

- A-1: Storage, Handling and Transfer of Hazardous Materials
- A-2: Storage, Handling and Transfer of Fuel
- A-5: Solid Waste Disposal
- A-6: Wastewater and Sewage Disposal
- A-7: Water Supply
- A -8: Air Quality and Dust Control
- A-9: Noise Control
- A-11: Pumps and Generators
- A-12: Equipment/Vehicle Maintenance
- A-13: Vehicular Traffic
- A-18: Laydown/Storage Areas
- A-21: Buffer Zones
- A-29: Bear Management
- A-32: Nuclear Source

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- Incident and complaint action plan

These environmental protection measures are presented in Appendix A.

**4.2.2 Site Specific Measures**

Air quality and dust control during the operations period will consist as follows; Silica shall be tested quarterly using a third-party consultant to ensure compliance with existing TLV regulations. For further details, refer to the Silica Management Plan. In accordance with NL legislation, all employees during the operations phase shall have available to them respirators upon request. In the event of 0.5 TLV occurring, respirators will be recommended, and at 1.0 TLV respirators will be mandatory and enforced. Inside of the dome, the following parameters will be monitored internally, and in accordance with an established schedule by a third-party for adherence with respective threshold limit values (TLV’s): CO, CO2, O2, LEL, H2S, and NO2.

All non-hazardous wastes associated with the operations phase will be divided into domestic, wood, and metal and sent off-site accordingly. Under no circumstances is tailings (process) water to be allowed to discharged anywhere other than Timmins 2. All hazardous wastes as identified in the Waste Management Plan will be disposed of in accordance with Newfoundland and Labrador regulations, with Used Oil/Glycol/Waste being removed at regularly established intervals. All wastes should be stored in suitable receptacles.

Any spills occurring during the operations phase of the project are subject to reporting

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and investigation by TSMC environment, with the responsibility of cleanup falling to the responsible party.

MSDS documents for all potentially hazardous materials utilized during the operations phase of the project will be provided by respective contractors prior to commencement of work.

All storm drainage, snow, and snowmelt from the process plant and associated area should be directed to Sedimentation ponds 1 or 2 prior to discharge to the environment; under no circumstances should water be allowed into Timmins 1 without previous treatment. All buffer zones as they relate to Timmins 1 should not be encroached upon

**4.2.3 Sensitive Areas and Periods**

Where possible, operations activities shall avoid areas of wildlife concentrations, as traffic would disturb wildlife during critical periods. If encounters with wildlife are unavoidable, the contingency plan detailed in Appendix B-2 will be followed. Noise disturbances may, have a negative impact on breeding success by creating acoustic interference. (Groupe hemisphere 2011). In the event of encountering Caribou during the operations phase, the processing facility must follow the shut-down procedures as prescribed in Section 2.3 compliance monitoring. Timmins 1, an old pit located in the south of the plant is considered a Fish Habitats by DFO. Due to this particularity, all activity around this pit shall be done with precautions while taking, into consideration, the rick to fish habitats. Electrical fishing and special monitoring is required by DFO; the variation level of the pit is also monitor on a weekly basis. During spring freshet or other periods which may cause flow from Sedimentation pond 2 into

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Timmins 1, weekly analysis of effluent is required in accordance with MMER.

**4.3. Processing Complex and Associated Buildings (Construction Phase)**

The DSOT processing complex will be largely contained within a dome and will consist of six major processes; Sizing, Crushing, Separation, Concentration, Dewatering, Drying, and Loading. Before entering the dome, all material must pass through sizing and screening through Plant 1, located directly north of the dome. After entering the dome, the material will be separated, concentrated, and dewatered through the wet and dry circuits. Following this, material is dewatered and dried before exiting the dome via enclosed transfer conveyors to be loaded in rail cars.

For the purposes of this EPP, the processing complex also includes the maintenance facility and administration building. The maintenance facility will be used to repair and maintain the fleet of heavy equipment, mobile equipment, and light vehicles, while the administration building will serve as an administrative office for up to 100 staff. Due to the environmental risk and specific measure the tank farm and other fuel management description and procedure are detailed in a specific section.

A reverse-pressurized wastewater system collects all wastewater from the potable water system in underground reservoirs to allow for separation of solids, while liquid wastes are manually pumped to the DSOT camp facility for treatment in their dedicated MBR units.

At this stage the plant is under construction. This section is applied only to **plant construction**. The final phase of plant construction will be completed early 2015.

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**4.3.1 Applicable Activities**

The following activities and the associated environmental protection measures are relevant at the processing complex during the construction period.

- A-1: Storage, Handling and Transfer of Hazardous Materials
- A-2: Storage, Handling and Transfer of Fuel
- A-5: Solid Waste Disposal
- A-6: Wastewater and Sewage Disposal
- A-7: Water Supply
- A-8: Air Quality and Dust Control
- A-9: Noise Control
- A-11: Pumps and Generators
- A-12: Equipment/Vehicle Maintenance
- A-13: Vehicular Traffic
- A-18: Laydown/Storage Areas
- A-21: Buffer Zones
- Incident and complaint action plan

These environmental protection measures are presented in Appendix A.

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**4.3.2 Site Specific Measures**

Air quality and dust control during the construction period will consist as follows; Silica shall be tested quarterly using a third-party consultant to ensure compliance with existing TLV regulations. For further details, refer to the Silica Management Plan. In accordance with NL legislation, all employees during the construction phase shall have available to them respirators upon request. In the event of 0.5 TLV occurring, respirators will be recommended, and at 1.0 TLV respirators will be mandatory and enforced.

Construction equipment using combustion engines (zoom boom, lift truck, loader, generator, etc.) shall not be operated inside of the dome structure unless required. All necessary equipment is not to be left running if not in use. The following parameters will be monitored internally, and in accordance with an established schedule by a third-party for adherence with respective threshold limit values (TLV’s): CO, CO2, O2, LEL, H2S, and N02.

All construction waste is to be separated into metals, domestics, and woods before being disposed of accordingly at the on-site landfill. Under no circumstances are hazardous materials (Batteries, oil filters, used oil, etc.) from the construction period to be disposed of in the on-site landfill. Hazardous wastes are the responsibility of the respective contractor and disposal should be arranged at regular intervals at their expense. Washing of all vehicles will be performed in designated areas only with appropriate secondary treatment of wash water is available.

During the construction of concrete components, formwork shall be properly constructed

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to prevent any fresh concrete from entering a body of water. Dumping of concrete or washing of tools and equipment in any body of water is prohibited. All storm drainage, snow, and snowmelt from the process plant and associated area should be directed to Sedimentation ponds 1 or 2 prior to discharge to the environment; under no circumstances should water be allowed into Timmins 1 without previous treatment. All buffer zones as they relate to Timmins 1 should not be encroached upon.

Any spills occurring during the construction phase of the project are subject to reporting and investigation by TSMC environment, with the responsibility of cleanup falling to the responsible party. MSDS documents for all potentially hazardous materials utilized during the construction phase of the project will be provided by respective contractors prior to commencement of work.

**4.3.4. Sensitive Areas and Periods**

Where possible, operations activities shall avoid areas of wildlife concentrations, as traffic would disturb wildlife during critical periods. If encounters with wildlife are unavoidable, the contingency plan detailed in Appendix B-2 will be followed. Noise disturbances may, have a negative impact on breeding success by creating acoustic interference. (Groupe hemisphere 2011). In the event of encountering Caribou during the construction process, the construction site must follow the shut-down procedures as prescribed in Section 2.3 compliance monitoring.

Timmins 1, an old pit located in the south of the plant is considered a Fish Habitats by DFO. Due to this particularity, all activity around this pit shall be done with precautions while taking, into consideration, the rick to fish habitats. Electrical fishing and special monitoring is required by DFO; the variation level of the pit is also monitor on a weekly

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basis. During spring freshet or other periods which may cause flow from Sedimentation pond 2 into Timmins 1, weekly analysis of effluent is required in accordance with MMER.

**4.4. DSO4 (Kivivic area)**

Beginning in Spring 2015, TSMC will begin preparations for commencement of mining operations in the DSO4 (Kivivic) area. The DSO4 area will comprise the following facilities; five open pits covering 69.5 hectares, two tiered sedimentation ponds comprising 90.7 hectares, three overburden piles comprising 15.2 hectares, three topsoil stockpiles covering 3.9 hectares, three waste rock stockpiles over 92.2 hectares, a small office and administration facility, and various haul roads. See Figure 4.4 below for a representation of the Kivivic area.

In accordance with the established MDP (Mine Development Plan), Kivivic 1, Kivivic 2, and Kivivic deposits are to be cleared and developed in 2015, 2016, and 2016 respectively while Kivivic 5 and Kivivic 3 being developed in 2019 and 2022. These deposits cover mining leases M217, M218 and M219 while falling under mineral license 020421M and Surface Rights Lease 146.

The site-specific procedures to be applied for the Kivivic area can be effectively divided into two categories; those which apply to site development, and those which apply to site operation.

**4.4.1. Applicable Activities**

The following activities and the associated environmental protection measures are

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relevant at the processing complex during the construction period.

- A-3: Blasting and Drilling
- A-4: Dewatering of Work Areas
- A-7: Water Supply
- A-8: Dust Control
- A-9: Noise Control
- A-11: Pumps and Generators
- A-12: Equipment/Vehicle Use and Maintenance
- A-13: Vehicular Traffic
- A-14: Road Maintenance
- A-15: Stream Crossings
- A-17: Waste Rock Piles
- A-19: Clearing and Disturbance to Vegetation
- A-20: Grubbing and Disposal of Related Debris
- A-21: Buffer Zones
- A-22: Erosion Prevention
- A-24: Excavations, Embankments and Grading
- A-25: Surveying
- A-26: Cultural Heritage

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- A-27: Incidents and Complains
- A-29: Bear management
- A-30: Snow removal
- A-31: Silica testing

These environmental protection measures are presented in Appendix A.

**4.4.2. Site Specific Measures**

Air quality and dust control during the construction period will consist as follows; Silica shall be tested quarterly using a third-party consultant to ensure compliance with existing TLV regulations. For further details, refer to the Silica Management Plan. In accordance with NL legislation, all employees during the construction phase shall have available to them respirators upon request. In the event of 0.5 TLV occurring, respirators will be recommended, and at 1.0 TLV respirators will be mandatory and enforced.

Mining in the DSO4 area will begin in early spring 2015 with development of Kivivic 1c and 2. All mining in the Kivivic area must be careful to ensure that contact water is directed towards sedimentation pond(s) and that at no time is contact water allowed to enter Joan brook without prior sedimentation.

Clearing and overburden removal shall take into account Joan lake and its associated drainages, with organic material being stored greater than 20m away from any permanent or intermittent streams, brooks, or water bodies in compliance with

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Commercial Cutting Permit requirements if required. During the development stages, cleared material must be stockpiled in areas well away from water bodies with silt fencing being placed in appropriate drainage areas while water management infrastructure is being construction to prevent suspended material from entering drainages.

During the development phase of the Kivivic deposits, Pit development shall respect water bodies and streams, with approval from the Government of Newfoundland and Labrador being acquired prior to installation of culverts, infill of wetlands or water bodies, or dewatering. Road construction shall respect stream crossings, with approval from the Government of Newfoundland and Labrador being acquired for all bridges, culverts and other crossings. Kativik regional government approval for construction of haul roads with 30m of wetlands will be acquired when necessary.

Blasting operations were developed with this in mind, and specific policies are to be applied for blasting in the vicinity of Joan Lake:

- Fisheries and Oceans Canada Guidelines for the Use of Explosives in or near Canadian Fisheries Waters must be followed when blasting on land.
- No explosive is to be detonated in or near fish habitat that produces an instantaneous pressure change greater than 100 kPa in the swimbladder of a fish.
- No explosive is to be detonated that produces, or is likely to produce, a peak particle velocity greater than 13mm s<sup>-1</sup> in the spawning bed during the period of egg incubation.
- To keep the fish away when blasting near water, small charges must be fired to

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scare the fish shortly before the main charge is fired.

- No explosive must be used in or near water.

Any spills occurring during the construction and operation phases of the project are subject to reporting and investigation by TSMC environment, with the responsibility of cleanup falling to the responsible party. All buffer zones respective to Joan Lake must be maintained, enforced, and inspected by TSMC environment staff at regular intervals.

The water level of Joan lake must be regularly monitored and recorded by TSMC environment staff to ensure any drainage into the Kivivic 5 pit is noted and a mitigation strategy is developed. All storm drainage, snow, and snowmelt from the Kivivic area and pit dewatering should be directed to the respective sedimentation ponds prior to discharge to the environment as per the Joan lake / Kivivic water management plan. Dust levels shall be monitored at regular intervals and airborne dust shall be suppressed during temperate months by use of water suppression. A RTQWM station will be installed, maintained, and monitored at Joan Brook through joint agreement between TSMC and the Government of Newfoundland and Labrador.

The Kivivic area infrastructure will also comprise an extensive water management infrastructure, including two sedimentation ponds. These sedimentation ponds will require frequent inspection and review to avoid any potential disturbances to Joan lake, including red water. See figure 4.5.

***Figure 4.5 Kivivic Water Management Infrastructure***

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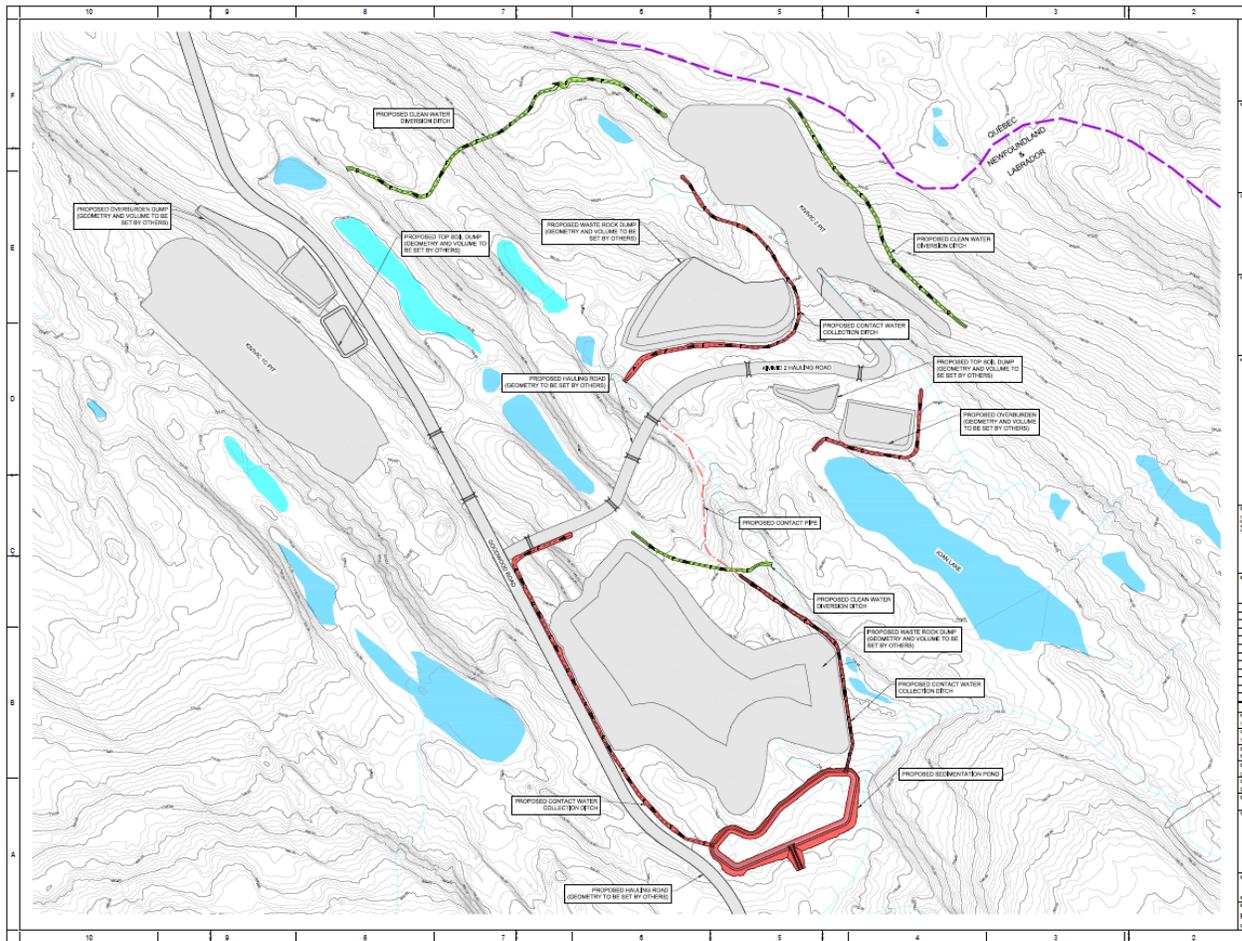
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### 4.4.3. Sensitive Areas and Periods

Migratory caribou can be found within the area, mainly during their fall migration, usually from July to October. The preferred migration routes of the caribou are high ridges and open black spruce- lichen forest. The caribou have adapted to the formerly mined area by using old mining roads should they happen to lead in the same direction as that in which they are migrating. Where possible, operations activities shall avoid areas of

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wildlife concentrations, as traffic would disturb wildlife during critical periods. If encounters with wildlife are unavoidable, the contingency plan detailed in Appendix B-2 will be followed. Noise disturbances may, have a negative impact on breeding success by creating acoustic interference. (Groupe hemisphere 2011). In the event of encountering Caribou during the construction process, the construction site must follow the shut-down procedures as prescribed in Section 2.3 compliance monitoring. Joan brook is an area of special concern in the Kivivic area, with several site specific policies to be followed as described above. Special consideration is to be given to blasting and other work required in the Joan lake area during fish spawning season. All staff working in this area must receive additional training on working near Joan lake, as well as recognizing endangered species such as the Rusty Blackbird. Consideration should be made during periods of waterfowl breeding seasons to avoid disturbing transient nesting waterfowl.

**4.5. Railway**

**4.5.1 TSMC Rail loop loading area**

The DSO-Timmins Project / Goodwood Deposit Project will require an operational yard track. It will be built largely on the bed of a former track built and operated by Iron Ore Company (of Canada). No new culverts will be required. The yard track will be a loop for the railcar-loading station. Infrastructure to be installed will include sleepers, rails and ballast. It will be ready in June 2014.

The processed ore will be transported to the rail car loading station by means of covered belt feeders to the rail cars, from where it will be shipped off site. The railway will be used to transport supplies and when necessary some employees to and from the site.

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**4.5.1.1. Applicable Activities**

The following activities and the associated environmental protection measures are relevant at the yard track:

- A-1: Storage, Handling and Transfer of Hazardous Materials
- A-2: Storage, Handling and Transfer of Fuel
- A-8: Air Quality and Dust Control
- A-9: Noise Control
- A-12; Equipment/Vehicle Maintenance
- A-13: Vehicular Traffic
- A-18: Laydown/Storage Area
- A-21: Buffer Zones
- A-22: Erosion Prevention

These environmental protection measures are presented in Appendix A.

**4.5.1.2. Site-Specific Measures**

In order to limit loss of DSO product, various types of polymers may be sprayed onto the product after it has been loaded into rail cars. Polymers will be used at an approximate quantity of one liter per rail car. Polymers shall be stored and handled as

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per the on-site hazardous materials management plan entitled "Fuel and Hazardous Materials: Storage Handling and Emergency Response" (Appendix B-1), and a Material Safety Data Sheet (MSDS) shall be present where polymers are used and/or stored. Bag houses and other dust-collecting mechanisms will be in place and operational wherever the ore is transferred or transported.

**4.5.1.3. Sensitive Areas and Periods**

Consideration should be given to decreasing rail activity during periods of high wildlife activity.

**4.5.2. TSMC Main Track**

The DSO Timmins/Goodwood project will also involve a 21 Km rail connection linking the DSO Timmins project with the on-site rail loop to existing Tshuetin Rail Transportation facilities adjacent to the community of Schefferville, Quebec. Construction of this rail connection allows TSMC products access to the necessary rail infrastructure required to supply the port of Sept-Iles. This rail system will comprise 4.1km of new line and the renovation of 16.5 km of existing line. TSMC’s yard crew will deliver loaded ore cars from the processing complex (rail loop) to the Quebec-Labrador border, at which point Kérail (a subsidiary of Genesee & Wyoming Canada Inc.) will transport the loaded cars to Tshuetin Rail Transportation at Schefferville.

**4.5.2.1. Applicable Activities**

- A-1: Storage, Handling and Transfer of Hazardous Materials

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- A-2: Storage, Handling and Transfer of Fuel
- A-8: Air Quality and Dust Control
- A-9: Noise Control
- A-13: Vehicular Traffic
- A-15: Stream Crossing
- A-19: Clearing and Disturbance of Vegetation
- A-21: Buffer Zones
- A-22: Erosion Prevention
- A-23: Trenching
- A-24: Excavation, Embankment, and Grading
- A-25: Surveying

#### 4.5.2.2. Site-Specific Measures

Regular inspection of stream crossings should be conducted to ensure silt and sediment are not being discharged directly to environment

#### 4.5.2.3 Sensitive Areas and Periods

Birds: Appropriate measures will be taken to prevent any threat to Rusty Black Bird habitat due to TSMC Main Track operations

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**4.6. Tailings Area and Tailings/Effluent Pipeline**

The tailings will be initially disposed of in the mined-out Timmins 2 pit, and the containment system will operate in closed circuit with the processing complex. Runoff and pit dewatering will be discharged to a system of sedimentation ponds and then to Timmins 1 or Goodream Creek. Tailings will be monitored, and effluents will be regularly tested and will comply with the *Environmental Control Water and Sewage Regulations* (GNL 65/03) under the Newfoundland and Labrador Water Resources Act and the *Metal Mining Effluent Regulations* (Canada) SOR/2002-222. There will be no discharge to the environment.

The tailings pipeline will be 1,600 m long, running between the processing complex and Timmins 2. The tailings will flow by gravity to Timmins 2. The process water reclamation pipeline will be approximately 2,000 m long and will run alongside the tailings pipeline for most of its length with a steel section near its low point to handle increased pressure. The floating reclamation water station will be anchored at the side of the Timmins 2 pit and will consist of two turbine pumps, one operating and one on stand-by, each with a capacity of 500 m<sup>3</sup>/h.

A temporary piping system utilizing existing infrastructure will be used during the commissioning period of the project, allowing tailings to discharge to T2 via a single corrugated steel pipe located on the South end of Timmins 2. In a permanent, long-term setting, a tailings deposition system will circle Timmin 2, allowing sediment to be deposited in a pre-determined pattern.

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**4.6.1. Applicable Procedures**

- A-1: Storage Handling and Transfer of Fuel
- A-2: Storage, Handling and Transfer of Hazardous material
- A-6: Wastewater and Sewage Disposal
- A-10: Tailings/Effluent Pipeline
- A-11: Pumps and Generators
- A-12: Equipment/Vehicle Maintenance
- A-13: Vehicular Traffic
- A-21: Buffer Zones
- A-22: Erosion Prevention
- A-25: Surveying

These environmental protection measures are presented in Appendix A.

**4.6.2. Site-Specific Measures**

1. If the plant shuts down, an extra pump will flush the pipeline with water and will drain itself into the tailings pit.
2. A flow detector will be installed at the outflow of the tailings pipeline to indicate potential blockages or stoppages in the pipeline. The duty staff will react quickly and appropriately.

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3. When in operation, the tailings and process water reclamation pipelines will be inspected visually once per 12-hour shift.
4. In the event of a tailings leak, the material will be moved to Timmins 2.

#### 4.6.3 Sensitive Areas and Periods

Areas in the vicinity of the tailings/effluent and process water reclamation pipelines that may be sensitive to spills and leaks may include wetlands and water bodies. These areas will be identified and the appropriate spill response equipment will be available at these sensitive locations to ensure that any spill/leak is mitigated. The sensitivity of Goodream and Elross Creek is defined by NL government, DFO and Environment Canada. TSMC is participating in a joint federal-provincial real time water monitoring program with two operational stations; one in Elross Creek and the other in Goodream Creek. Timmins 1, located directly adjacent to the Processing facility, is designated by the federal government as fish habitat, and as such no water may be discharged to Timmins 1 without prior sedimentation. In addition, no work shall take place within 15m of Timmins 1 without environmental approval.

#### 4.7. Mine Sites

The mine sites include the open pit areas, quarries, as well as the waste rock and overburden piles. The deposits at Timmins 4 and Fleming 7N will be mined first. When these are mined out, there are preliminary plans to mine the Timmins 7, Goodwood, Kivivik 3N and Kivivik 5 deposits. This information will be updated as work progresses. The Timmins 4 south pit will be the first deposit to be exploited, followed by Fleming 7N.

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The high grade and low stripping ratio nature of the Timmins 4 deposit makes it ideal for DSO product. Fleming 7N has a higher stripping ratio, making it suitable for mining during the winter where shipping product is much more difficult and may be limited by weather conditions.

Mining will use conventional open pit methods, which will primarily entail removal of overburden and pit dewatering during the pre-production phase. The pits will be drilled, blasted and the run-of-mine (ROM) ore will be loaded into trucks and transported to the primary sizer located near Timmins 1.

Crushers, dryers, screens, conveyors, elevators and hoppers installed in a quarry or at any loading or unloading stations shall not generate dust visible in the atmosphere more than 2.0 m from the emission source. During the first year, ore will be transferred to a temporary crushing plant near Fleming 7 and after that ore will be transferred by truck to Labrador Iron Mine’s Silver Yard until the train is operational.

When only one pit is in operation, one ore truck will transit approximately every 15 minutes and one truck hauling waste will transit approximately every 20 minutes.

Three types of wastes will be generated during the mining process:

1. Organic material, which will be stockpiled and used for site rehabilitation;
2. Overburden, some of which will be used in mine reclamation; and
3. Internal waste, which is considered non-economical ( $\leq 50\%$  Fe and  $\geq 18\%$  SiO<sub>2</sub>).
4. These waste piles will be separate and located near the open pits to limit transportation costs and the associated emissions.

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#### 4.7.1. Applicable Procedures

The following activities and the associated environmental protection measures are relevant at the mine sites:

- A-1: Storage, Handling and Transfer of Fuel
- A-2: Storage, Handling and Transfer of Hazardous Material
- A-3: Blasting and Drilling
- A-4: Dewatering of Work Areas
- A-5: Solid Waste Disposal
- A-8: Air Quality and Dust Control
- A-9: Noise Control
- A-10: Tailings/Effluent Pipeline
- A-11: Pumps and Generators
- A-12: Equipment/Vehicle Maintenance
- A-13: Vehicular Traffic
- A-14: Road Maintenance
- A-16: Quarrying and Removal of Aggregate
- A-17: Waste Rock Piles
- A-18: Laydown/Storage Areas
- A-19: Clearing and Disturbance to Vegetation

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- A-20: Grubbing and Disposal of Related Debris
- A-21: Buffer Zones
- A-22: Erosion Prevention
- A-23: Trenching
- A-24: Excavations, Embankments and Grading
- A-25: Surveying
- A-29: Bear Management
- A-26 Cultural Heritage

These environmental protection measures are presented in Appendix A.

#### 4.7.2 Sites Specific Measures

1. Waste rock piles will have perimeter ditches to direct run-off to catchment basins, in order to allow settling of suspended solids.
2. Waste rock benches will have a slope gradient away from the dumping face to prevent rainwater from eroding the dump face.
3. Surface run-off will not be allowed to enter the pit. Ditches will be built to encircle the pits, and water will be directed into natural drainage areas in order to ensure no contamination of surface water.
4. Water pumped from the pits will be released in sedimentation ponds or another

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abandoned pit, which will act as a sedimentation pond.

5. There will be no fuel storage or refueling facility at the mine sites. Auxiliary equipment will be fuelled directly by the mobile fuel truck, while the haul trucks will be refueled at the processing complex.
6. No solid waste will be disposed of at the mine sites. All solid wastes will be collected in animal-resistant containers and transferred to the landfill as defined the waste management plan.
7. During processed ore transportation by rail, various types of polymers will be applied to the DSO product to prevent dust production and loss by wind.
8. There will be no washroom facilities at the mine sites, since there will be no buildings. Portable latrines will be available and will be emptied regularly by an approved contractor and discharged to the waste water treatment at the camp.
9. Migratory caribou can be found within the area, mainly during their fall migration, usually from July to October. The caribou have adapted to the formerly mined area by using old mining roads should they happen to lead in the same direction as that in which they are migrating. Where possible, operations activities shall avoid areas of wildlife concentrations, as traffic would disturb wildlife during critical periods. If encounters with wildlife are unavoidable, the contingency plan detailed in Appendix B-2 shall be followed.
10. All staff working in this area must receive additional training on Rusty Blackbird identification and procedures.

#### 4.7.3 Storm Water Management

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During the operation phase, it is important that particular attention is given to storm water management to ensure sediments and related contamination does not enter any nearby water bodies, and to limit erosion. Figure 4.7 presents the on-site stormwater system. The following provides a description of protection measures and design aspects of sedimentation ponds and drainage systems around the DSO-Timmins Project Project:

1. Run-off within the processing complex area will be captured by perimeter ditches alongside the site roads. Run-off towards the south-west will be directed through the ditch along part of the access road and towards the existing sedimentation pond located below the Timmins 2 waste rock pile, between Timmins 2 and the railway loop.
2. Run-off towards the north-east from the processing complex will be directed through a perimeter ditch towards the sedimentation pond located east of the railway loop.
3. The sedimentation pond system comprising 3 facilities (Pond A, B, and 3) will hold a combined 25,000 m<sup>3</sup> of water for a retention time of approximately 24 hours, which is estimated to be large enough for the spring run-off.
4. The water from sedimentation ponds A and B will be discharged to Timmins 1 as per the water management plan. This discharge will be monitored weekly for water quality and the water level in Timmins 1 will be surveyed monthly. Sedimentation pond 3 will discharge into Goodream creek.
5. Specific environmental monitoring is required at the outlet of Timmins 1 (Elross Creek) and Timmins 4 (Goodream Creek).
6. Environmental long term effect program from Environment Canada is required

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during the life of the project.

**Figure 4.7**



#### 4.7.4. Sensitive Areas and Periods

Removal of overburden and stockpiling of waste rock and other wastes will result in loss of habitat, including loss of wetlands that are important for certain at-risk migratory birds such as the Rusty Blackbird. Wetlands in these areas will be inspected at least annually to ensure that the loss of wetland habitat does not exceed what was predicted.

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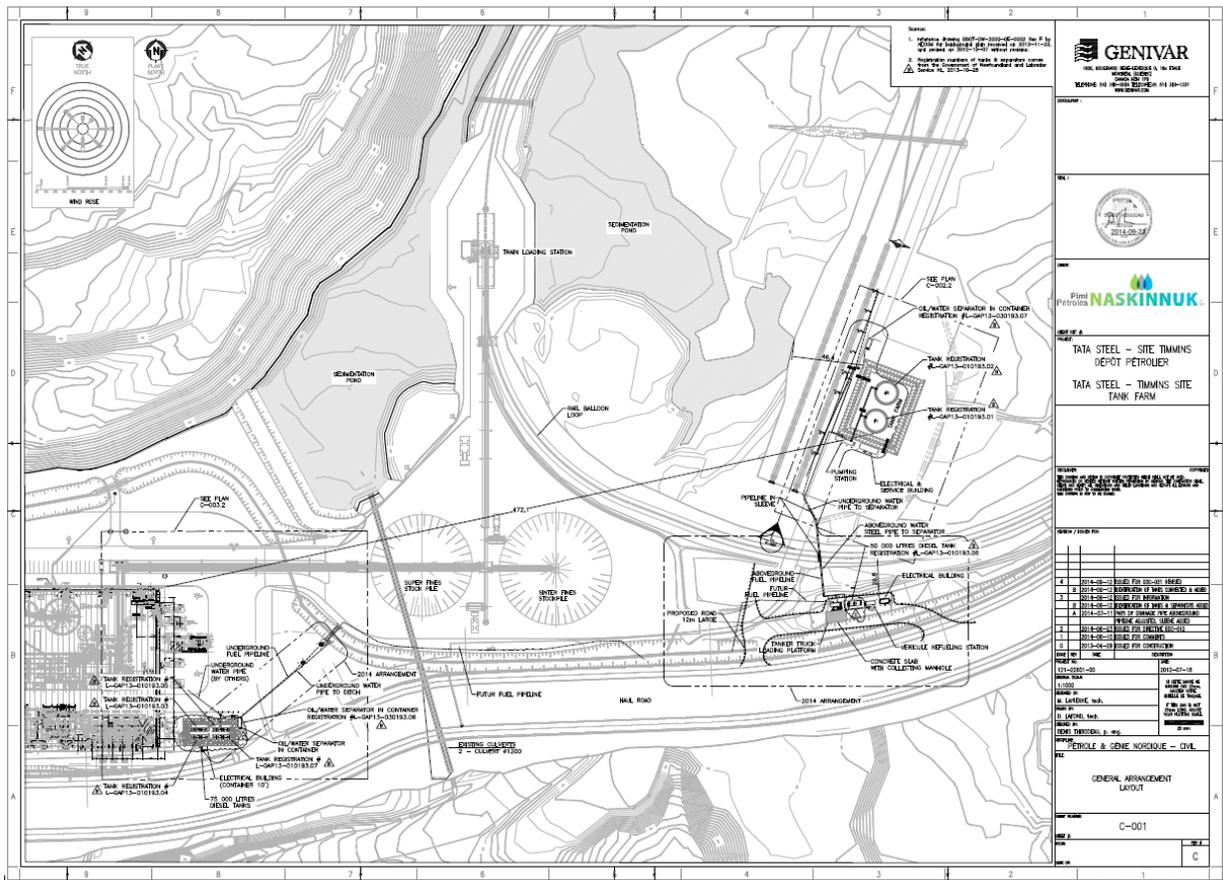


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4.8. Fuel Farm and associated reservoirs

A fuel farm comprising two vertical reservoirs of 1.2 million L is located directly adjacent to the rail loop and will receive fuel on a regular basis via train. Four 75,000 L reservoirs adjacent to the DSOT process plant will act as 'day' tanks, with an additional 50,000L reservoir located adjacent to the main access road for fueling of light vehicles.

Figure 4.8 Fuel Farm and Associated reservoirs



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**4.8.1 Applicable Procedures**

The following procedures and the associated environmental protection measures are relevant at the fuel farm:

- A-1: Storage, Handling and Transfer of Hazardous Materials
- A-2: Storage, Handling and Transfer of Fuel
- A-8: Air Quality and Dust Control
- A-9: Noise Control
- A-11: Pumps and Generators
- A-12: Equipment/Vehicle Maintenance
- A-13: Vehicular Traffic
- A-21: Buffer Zones

These environmental protection measures are presented in Appendix A.

**4.8.2 .Site Specific Measures**

1. Fuel unloading from the train;
2. Oil separator maintenance and water monitoring;
3. Dust management due to the train activity;

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4. Rainwater and snowmelt at the fuel farm will be collected in sedimentation pond and discharge to Timmins 1;
5. Effluent will meet Environmental *Control Water and Sewage Regulations* (GNL 65/03);
6. Emergency plan

#### 4.9. Fueling Truck

Vehicles, tanks, generators and other pieces of equipment throughout the site are to be filled with the use of a mobile fueling truck operated by an independent contractor. Fuel will arrive on-site by means rail, and distributed to a 50,000L vehicle fueling station where it will be then discharged to 18,000L mobile fueling trucks for distribution to mobile equipment around the DSO3 and DSO4 areas.

##### 4.9.1. Applicable Procedures

The following procedures and the associated environmental protection measures are relevant for the fuel truck and its fueling activities:

- A-1: Storage, Handling and Transfer of Hazardous Materials
- A-2: Storage, Handling and Transfer of Fuel
- A-8: Air Quality and Dust Control
- A-9: Noise Control
- A-11: Pumps and Generator
- A-12: Equipment/Vehicle Maintenance

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- A-13: Vehicular Traffic
- A-21: Buffer Zones
- A-29: Bear Management
- A-31: Snow removal

These environmental protection measures are presented in Appendix A.

**4.9.2. Equipment Specific Measures**

1. Fueling procedure including truck and light vehicles;
2. Fuel unloading from tank;
3. Emergency plan

**4.10. Fuel Reservoirs**

In addition to the two (2) trackside reservoirs of 1.2 million liters located adjacent to the track facilities, several other reservoirs are located throughout the DSO-Site including five (5) reservoirs of 75,000 L at the dome facility, three (3) reservoirs of 26,000 L at the dryer/secondary processing plant, and various other reservoirs associated with vehicle maintenance, generators, or heating throughout the camp.

**4.10.1 Applicable Procedures**

The following procedures and the associated environmental protection measures are relevant at the fuel reservoirs:

- A-1: Storage, Handling and Transfer of Hazardous Materials

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- A-2: Storage, Handling and Transfer of Fuel
- A-7: Water Supply
- A-8: Air Quality and Dust Control
- A-11: Pumps and Generators
- A-12: Equipment/Vehicle Maintenance
- A-13: Vehicular Traffic
- A-21: Buffer Zones
- A-29: Bear Management
- A-30: Snow removal

These environmental protection measures are presented in Appendix A.

#### 4.10.2. Site Specific Measures

1. Fueling procedures including truck and light vehicles
2. Fuel unloading from the train
3. Emergency plan

#### 4.11. Access and Site Roads

Roads required for the operation of the DSO-Timmins Project / Goodwood Deposit

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Project include site roads and a main road from south east Quebec border to north west Quebec border; an access road from Schefferville to the camp is also required. Later on in the project, a from the DSO Timmins site north to the DSO 2a and 2b will be constructed. All site roads except for the road from the main road will be 21 m wide; some roads will be constructed from mine waste covered by 150 mm of borrowed pit-run material, as they all are likely to be used by mining trucks. The road to the camp, which will not be used by mining trucks, will be 12 m wide. The access road will be travelled by suppliers of goods and services to the mine, and by project vehicles such as the buses transporting local employees. A by-pass road will be constructed to allow local users to by-pass the site infrastructure and continue northward. Roads can be divided into four categories;

- 24 Km road connecting the DSO3 Camp with the community of Schefferville
- A 30 Km haul road connecting the DSO3 and DSO4 deposits
- A 3 Km haul/access road from the DSO3 Processing plant to the Howse deposit
- A 6 Km Bypass road allowing local users to bypass the DSO3 site

**4.11.1. Applicable Activities**

- A-1: Storage, Handling and Transfer of Fuel
- A-8: Dust Control
- A-9: Noise Control
- A-12: Equipment/Vehicle Maintenance
- A-13: Vehicular Traffic

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- A-14: Road Maintenance
- A-15: Stream Crossings
- A-19: Clearing and Disturbance to Vegetation
- A-20: Grubbing and Disposal of Related Debris
- A-21: Buffer Zones
- A-22: Erosion Prevention
- A-24: Excavations, Embankments and Grading
- A-25: Surveying
- A-26: Cultural Heritage
- A-29: Bear Management
- A-30: Snow Removal

These environmental protection measures are presented in Appendix A.

#### 4.11.2. Site-Specific Measures

1. A water truck will spray the roads whenever necessary in order to keep dust down.
2. The haul roads will have proper drainage and a 2% crown plus a berm on the sides.
3. The speed limit will not exceed 50 km/hour.
4. Culverts along the roads will be inspected and maintained regularly to ensure

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that proper drainage is achieved

5. The haul roads (excluding the main access road) and the roads to the waste rock piles will not be open to the public during periods of active mining at the sites in question. To avoid any Issue and prevent accident or incident a control gate is installed in the surface right boundary in each side of the main road

**4.11.3. Sensitive Areas and Periods**

Some of the existing roads cross wetlands; however traffic and transportation in relation to the operations phase of the DSO-Timmins Project /Goodwood Deposit Project will have little additional effect on wetlands and the at-risk migratory birds that use these habitats. Traffic including heavy equipment shall not be permitted to enter wetlands or any area that is not designated for traffic. If Site Road Access operations make encounters with migratory caribou unavoidable, the contingency plan detailed in Appendix B-2 will be followed. Appropriate measures will be taken to prevent any threat to Rusty Black Bird habitat due to Site Road Access operations.

**4.12. Landfill**

During the construction and operation phases of the mine, construction landfill will be required. The landfill will be located in an area well away from the camp and plant operations and will consist of several cells made from compacted dry soil which will be systematically compacted and covered at regular intervals to maximize usage. Recyclable material will not be disposed of at the landfill site, and neither will organic waste which will be treated at the on-site composter. Materials on the landfill site will be divided into three categories; domestic, wood, and metal with each clearly defined.

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Please refer to Appendix B for the full waste management plan.

**4.12.1. Applicable Activities**

- A-2: Storage, Handling and Transfer of Hazardous Materials
- A-5: Solid Waste Disposal
- A-6: Wastewater and Sewage Disposal
- A-8: Dust Control
- A-9: Noise Control
- A-13: Vehicular Traffic
- A-21: Buffer Zones
- A-27: Incident and Complaint
- A-29: Bear Management

**4.12.2. Site-Specific Measures**

Landfill shall be the subject of regular inspections to ensure compliance with governmental regulations regarding landfill use and waste disposal. Measures shall be taken by the security team to ensure bears or other animals do not become accustomed to landfill access through devices such as bear-bangers, etc.

Unacceptable materials found in the landfill are to be removed and disposed of properly. Sensitive Areas and Periods. If Landfill operations make encounters with migratory

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caribou unavoidable, the contingency plan detailed in Appendix B-2 will be followed.

Birds: Appropriate measures will be taken to prevent any threat to Rusty Black Bird habitat due to Landfill operations.

**5.0. Environmental Control Plans**

The following environmental control plans will be implemented during the course of this project:

- 5.1. Groundwater Control Plan
- 5.2 .Surface Water Control Plan
- 5.3. Erosion Control Plan
- 5.4. Air Quality and Dust Control Plan
- 5.5. Noise Control Plan
- 5.6. Vegetation and Wildlife Control Plan
- 5.7. Protected Species Control Plan
- 5.8. Incidents and Complaints Control Plan
- 5.9. Training Control Plan
- 5.10. Waste Management Control Plan
- 5.11. Chemicals, Fuels, and Hazardous Materials Control Plan
- 5.12. Silicate Control Plan
- 5.13. Safe Blasting Control Plan

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- 5.14. Bear Management Control Plan
- 5.15. Cultural Heritage Control Plan

All monitoring activities described in these plans are the responsibility of TSMC.

### 5.1 Groundwater Control Plan

<b>Objectives</b>	To monitor and assess the condition of the groundwater quality to prevent and minimize the risk of contamination.
<b>Performance Requirements</b>	Groundwater monitoring results to date indicate no significant deterioration of quality. Results must meet provincial groundwater quality criteria.

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**Implementation and Mitigation Strategy**

During the construction phase, if dewatering of foundation excavations is required. Contractor will use the extracted water for dust suppression or allow infiltration in the soil. Contractor will not discharge extracted water directly to the natural drainage system.

Contractor will install petroleum product reservoirs in dykes or basins that can contain 110% of the largest reservoir.

Contractor will use containers designed for hazardous materials storage or will be and line hazardous materials storage areas as per applicable regulation.

Contractors will fully berm all process areas, fuel storage, re-fuelling and wash- down areas and ensure adequate treatment and/or recuperation of material by an approved environmental liquid waste disposal company.

Contractors will ensure that discharges do not cause any adverse impacts on the water quality of receiving waters.

When dewatering the landfill the water must not be discharged directly to a watercourse or to a ditch leading to a watercourse without prior treatment.

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Any leachate or contaminated water from the landfill shall meet the discharge criteria of Schedule A of the Environmental Control and Sewage Regulations and the Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life prior to discharge.

The maximum allowable total petroleum hydrocarbons value is 15 ppm (mg/L)

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<p><b>Monitoring</b></p>	<p>Quarterly groundwater monitoring is required as a condition of the provincial Certificate of Approval. Monitoring results will be discussed with the Senior Manager – Environment to determine if any impacts are apparent.</p> <p>Management plans will be reviewed on a yearly basis and amended if a significant decrease in water quality is detected (i.e. monitoring shows that parameters are greater than 50% of the maximum water quality criteria, and/or significantly higher than background levels).</p>
<p><b>Reporting</b></p>	<p>The Environment Representative will compile the monitoring results and will report to the Senior Manager – Environment.</p> <p>TSMC will report monitoring results to the regulatory authority.</p>
<p><b>Identification of Incident or Failure to comply</b></p>	<p>Results of annual groundwater monitoring indicate standard results when compared to the background groundwater quality.</p>
<p><b>Corrective Action</b></p>	<p>EPCM Management Team will undertake an investigation to determine the cause the contamination and recommend necessary actions to TSMC.</p> <p>EPCM Management Team will review its plans and procedures to determine whether any modifications are necessary to avoid similar incident or failures to comply in</p>

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**5.2 Surface Water Control Plan**

<b>Objectives</b>	To protect existing surface water and to minimize the risk of contamination.
<b>Performance Requirements</b>	Monitoring results indicate no significant deterioration of quality. Results
<b>Implementation and Mitigation Strategy</b>	<p>Contractors will install petroleum product reservoirs in impounding basins that can contain 110% of the largest reservoir. Contractors will not discharge potentially contaminated water directly to the natural drainage system.</p> <p>Contractors will use containers designed for hazardous materials storage or will berm line hazardous materials storage areas as per applicable regulation.</p> <p>Contractors will fully berm all process areas, fuel storage, re-fuelling and wash-down areas and ensure adequate treatment and/or recuperation of material by an approved environmental liquid waste disposal company;</p>

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	<p>Contractors will ensure that discharges do not cause any adverse impacts on water quality of the receiving waters.</p> <p>Contractors will store all fuels and chemicals with appropriate confinement and will handle them in a manner that will minimize the potential for contamination of storm water runoff from the site.</p>
<b>Monitoring</b>	<p>Quarterly monitoring is required as a condition of the provincial Certificate of Approval. Monitoring results will be discussed with the HSE Manager and the Owner's Team to determine if any impacts are apparent.</p> <p>Management plans will be reviewed on a yearly basis and amended if a significant decrease in water quality is detected (i.e. monitoring shows that parameters are greater than 50% of water quality criteria, and/or significantly higher than background levels).</p>
<b>Reporting</b>	<p>Contractors will report all incidents as soon as possible and submit a monthly written report to the TSNC Environment Team on the following items:</p>

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	<p>Contractor’s compliance with approved erosion and sediment control plan;</p> <p>Incidents of significant erosion;</p> <p>Water quality monitoring results</p>
<p><b>Identification of Incident or Failure to Comply</b></p>	<p>The following will be classified as an incident or failure to comply in relation to storm water management:</p> <p>Breach in integrity of berms;</p> <p>Spilled chemicals or liquid wastes entering the storm water drainage system;</p> <p>Sedimentation pond showing a significant reduction of capacity;</p> <p>Total Suspended Solids (TSS) at the outlet of settling ponds above 30 mg/l.</p>
<p><b>Corrective Action</b></p>	<p>Should an incident or failure to comply occur in relation to storm water management, a selection of the following corrective actions will be considered where relevant:</p>

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	<p>Storm water controls (berms, drains) to be repaired; Sedimentation pond to be cleaned out; Erosion control plan to be reviewed by Contractors; Performance of the water treatment facilities to be reviewed;</p> <p>TSMC Environment Team will undertake an investigation to determine the cause of the incident and recommend necessary actions to TSMC.</p>
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### 5.3. Erosion Control Plan

<b>Objectives</b>	To minimize the potential impacts of erosion and sediment loss during construction related activities.
<b>Performance Requirements</b>	<p>The Site will be prepared to ensure that only natural erosion occurs at Creek banks in the area.</p> <p>Borrow sites will be prepared and operations conducted in a manner that will minimize erosion due to borrow operations.</p> <p>Erosion and sediment transport at the site is minimised</p>
<b>Implementation and Mitigation Strategy</b>	<p>Contractors will minimize impacts to adjacent vegetation and maintain a 15 m buffer zone for the protection of stream banks and wetlands, wherever possible.</p> <p>Work conducted within the 15 m buffer zone, must be</p>

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conducted so that all water within the work area is diverted towards a vegetated area. If necessary, a sedimentation basin will be created outside the riparian buffer to catch runoff and sediment before it enters the vegetated area.

Contractors will construct sedimentation basins in the early phase of construction and implement erosion control structures (e.g. silt fencing, filtering berms or membranes, sediment traps) as necessary to minimize off-site erosion effects.

Contractors will strip and stockpile top soil for subsequent reuse at the Site.

Contractors will decant site drainage run-off in settling ponds equipped with filtering berms prior to discharge to water bodies. Contractors will not dewater silt-laden water directly to a water body.

All water must be checked for potential contamination prior to being discharged into a waterway.

Exposure of bare soil will be kept to a minimum through quick re-vegetation of the area or other stabilisation methods in areas that construction has permanently ceased.

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	<p>Storm water drainage from soil stockpiles must be controlled using check dams and silt fences to prevent sediment-rich runoff from reaching Timmins 1.</p> <p>Contractors will install additional erosion control measures in the fall before winter freeze up in anticipation of runoff and erosion during the major spring melting event, particularly since this water will discharge to Timmins 1.</p>
<b>Monitoring</b>	Contractors will inspect and document the condition of erosion control structures on a weekly basis and following all significant storm events
<b>Reporting</b>	Contractors will provide an Erosion Control Plan prior to earthmoving activities. Contractors will update its Erosion Control Plan as its activities progress and provide the updated plans as they are developed.
<b>Identification of Incident or Failure to comply</b>	<p>Incidents will be defined as any un-planned discharge to the environment of significant amounts of suspended solids due to a failure of Contractor’s erosion control structures.</p> <p>Failure to comply with the mitigation measures identified in the Erosion Control Plan will constitute a failure to comply for reporting purposes</p>

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<b>Corrective Action</b>	<p>Contractors will immediately address the cause of all incidents and take necessary actions to mitigate the impacts of the incident on the environment.</p> <p>Contractors will immediately correct any failure to comply.</p> <p>Contractors will review its applicable plans and procedures to determine</p>
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#### 5.4. Air Quality Control Plan

<b>Objectives</b>	<p>To minimise the release of fugitive emissions from areas where construction activities are occurring.</p>
<b>Performance Requirements</b>	<p>Fugitive emissions, including odours, dust, smoke and fumes are either prevented or controlled so that they do not cause an environmental nuisance;</p> <p>Dust does not cause health, safety or environmental issues on site or beyond the boundaries of the site. A silica plan is submitted to OHS division</p>
<b>Implementation and Mitigation Strategy</b>	<p>Contractors will undertake regular water spraying of exposed areas subject to vehicle and machinery movements at a frequency and rate that will minimise dust generation while controlling runoff;</p>

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No open burning of wastes will be permitted;

Use of dust suppressants other than water or calcium chloride requires government approval.

A 30% solution of calcium chloride will be used in addition to spraying water to suppress dust on the roads between the middle of May and the end of August

Crushers, dryers, screens, conveyors, elevators and hoppers installed in a quarry or at any loading or unloading stations shall not generate dust visible in the atmosphere more than 2 m from the emission source

Contractors will re-vegetate as soon as possible exposed ground surfaces not required for construction operations;

If a justifiable complaint is received in relation to dust, the EPCM Team will immediately investigate it. If necessary, the EPCM Team will suspend works associated with excessive dust generation and only resume those activities when necessary corrective measures have been developed and implemented;

The HSE Manager will advise the complainant of the

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	<p>corrective action and subsequent results;</p> <p>Include fugitive air emissions and air quality management strategies in environmental awareness training</p>
<b>Monitoring</b>	<p>The EPCM Team will conduct regular visual inspections for evidence of excessive dust.</p> <p>The HSE Manager will implement an air quality monitoring program to monitor dust levels if required by NL legislation.</p> <p>Monitoring (sampling) for TPM and PM10 at workers" camp shall be conducted by TSMC over 1-2 months during mining at Timmins 3N.</p>
<b>Reporting</b>	<p>The HSE Manager will record all complaints in the incident/complaint register and will address those complaints in accordance with the provisions of the Incidents and Complaints Control Plan.</p>
<b>Identification of Incident or Failure to comply</b>	<p>Receipt of a fugitive emissions complaint or dust creating a health, safety or environmental issue on site;</p> <p>Observations of excessive dust levels generated on site.</p>
<b>Corrective Action</b>	<p>The site operations will be assessed to determine the source of the emissions and identify any significant modifications to activities that can be made to rectify the problem.</p>

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**5.5. Noise Control Plan**

<b>Objectives</b>	To prevent excessive noise emissions from site operations and construction activities.
<b>Performance Requirements</b>	Comply with Newfoundland noise standards.
<b>Implementation and Mitigation Strategy</b>	<p>Contractors will employ best available work practices to ensure that occupational noise levels meet required levels;</p> <p>Contractor will ensure that construction equipment is fitted with appropriate noise attenuation devices such as silencers and covers, and maintain the equipment in good condition;</p> <p>Contractor will limit noisy activities (i.e., those likely to adversely affect adjacent residences) such as drilling, excavating, earthworks, torque operations and crushing, to the hours from 7 am to 7 pm (or according to a schedule established to provide appropriate sleeping times for camp occupants).</p> <p>The Contractor will maintain the roads in good condition and impose speed limits;</p> <p>Contractor will use noise suppression equipment and/or measures where appropriate;</p>

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	EPCM Management Team will establish procedures for investigating enquiries, complaints and concerns of alleged excessive noise.
<b>Monitoring</b>	Should a justifiable noise complaint be received during construction, TSMC will develop and implement an appropriately designed monitoring program.
<b>Reporting</b>	<p>The Environment Representative will document all complaints in the complaint register, investigate the reported cause of the complaint, and document actions, if any, taken to address the complaint;</p> <p>The Environment Representative will report the results of any monitoring undertaken as a result of complaints.</p>

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<b>Identification of Incident or Failure to comply</b>	<p>The following represents an incident or failure to comply;</p> <p>Noise complaint/incidents received;</p> <p>Non-compliance with noise standards of the environmental authority.</p>
<b>Corrective Action</b>	<p>Should an incident or failure to comply occur, the following steps will be taken:</p> <p>The EPCM Management Team will investigate the ongoing activities to determine if the project is complying with its noise requirements; and</p> <p>The EPCM Management Team will review current procedures and control measures and determine whether additional control or mitigation is necessary to prevent recurrences.</p>

**5.6 Vegetation and Wildlife Control Plan**

<b>Objectives</b>	Minimise the impact of construction activities on species adjacent to construction areas.
<b>Performance Requirements</b>	Minimal impact of construction activities on the flora and fauna at the project site
<b>Implementation and Mitigation Strategy</b>	Contractors will limit workers' access to the cleared areas or those to be cleared.

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Contractors will limit the zones of clearing during the construction phase to those strictly necessary to the construction works. This area will be clearly marked prior to any works commencing.

Contractors will apply water to all non-paved access roads during the dry season in order to prevent dust deposition on nearby vegetation.

Contractors will use local indigenous species for the re-vegetation of the site and the rehabilitation of the temporarily used zones for the construction work; and replant these zones as soon as they are no longer used for the construction work or the realisation of the project.

Contractors will not permit its employees to engage in hunting, fishing, or feeding animals on the project site or on adjacent lands.

Plans will be developed to educate construction workers concerning the impacts on animals. Construction workers will be prevented from transporting or keeping pets in captivity.

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Under an agreement to be negotiated with the concerned governments, TSMC's Environmental specialist / Permit Manager will be notified when migratory caribou, which are monitored via satellite collars, come within 100 km of the DSOP. Upon receipt of such a notice, operations will continue work with caution. If data from the radio collars indicate that some of the migratory caribou have moved to within 20 km of the DSOP, TSMC will institute surveys within that radius to monitor their movements in greater detail. Should a group of roughly 100 or more migratory caribou move within 5 km of a pit in operation or of the processing complex, blasting, crushing and ore-transport will be suspended? Those activities will also be suspended when approximately 10 migratory caribou move within 3 km.

Activity will cease under the following circumstances:

if 10 or more sedentary caribou are within 20 km of an active pit or the processing complex;

if five or more sedentary caribou are within 5 km of an active pit or the processing complex; and

If one or more sedentary caribou are within 1 km of an active pit or the processing complex.

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Whenever activity ceases pursuant to the foregoing, TSMC will contact the Wildlife Division of the NLDEC to discuss any further steps to be taken.

It is not known whether a given group of caribou belongs to the migratory or the sedentary ecotype, site workers assume that they are sedentary caribou and will act accordingly.

Work activities will be re-scheduled where necessary to avoid wildlife encounters.

Equipment and vehicles will yield the right-of-way to wildlife.

No personal pets, domestic or wild, will be allowed on the site. However, if a dog is required for deterrence purposes, approval will be obtained.

All active bird nests found on site are to be immediately reported to the Environment Representative, which will report them to the relevant governmental authorities. A protective zone will be established wherever rare or endangered species or any migratory bird species are encountered, until the nesting cycle is completed.

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All personnel shall be aware of the potential for encounters with Black bears and other potentially dangerous wildlife. All sightings of wildlife should be reported immediately to the Environment Representative.

The Environment Representative will be responsible for actions when nuisance animals are identified within the working areas. The Environment Representative may consult with the Wildlife Division to determine an appropriate response, which will comply with appropriate regulations and permits.

Deterrent measures will be used before more lethal means are used.

This may include flags, streamer tape, scarecrows or boats with human-like dummies for migratory birds. Propane cannons, blank pistols or pyrotechnical pistols firing cracker shells at a velocity less than 495 feet per second, which do not require a permit, may also be used.

A permit must be obtained for trapping and destroying nuisance animals. Anytime an animal must be destroyed the Wildlife Division will be notified.

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	<p>Any bear that has been killed will have its head removed, frozen and submitted to the Wildlife Division. Local communities will be notified to determine if the remains can be utilized by any member of the local community.</p> <p>Firearms are prohibited in the workers" camp, except for two that may be used by security personnel in a case of emergency.</p>
<b>Monitoring</b>	<p>Monitoring of vegetation health adjacent to the construction site will be undertaken during and after construction;</p> <p>Contractors will carry out semi-annual qualitative (visual) inspections to evaluate the effectiveness of the reclamation and re-vegetation programs.</p>
<b>Reporting</b>	<p>Reporting Contractors will clearly define, on construction plans, the limits of the zones to be deforested and the zones reserved for the construction activities, as well as the assigned project limits;</p> <p>Contractors will submit the results of monthly and semi-annual inspections to the EPCM Management Team within two weeks of the inspections.</p>

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<b>Identification of Incident or Failure to comply</b>	<p>An incident will be defined as the non-planned clearing/removal of vegetation or another activity involving the immediate destruction of a large quantity of vegetation or natural habitat, apart from the indicated clearing zones;</p> <p>Neglecting to conform to the mitigation measures defined in the EIS or in this control plan will constitute non-conformity to the needs for the reports;</p> <p>A non-conformity can occur in the following ways: deterioration of the plants surrounding the construction site; poor plant growth; and fish or animal mortality near or immediately downstream of the project area.</p>
<b>Corrective Action</b>	<p>In the event of an incident, Contractors will immediately determine the cause and make the necessary provisions in order to mitigate its environmental impacts;</p> <p>Regulatory authorities will be contacted by TSMC staff as appropriate;</p> <p>Contractors will immediately correct any nonconformity to the mitigation measures identified in the EIS or this control plan;</p>

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	Contractors will review plans and methods in order to determine if they should be modified so that similar incidents or nonconformities can be prevented from reoccurring.
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**5.7. Species at Risk Control Plan**

<b>Objectives</b>	To protect the federally and provincially protected species around the project area.
<b>Performance Requirements</b>	Minimise the impact of construction on the Rusty Blackbird
<b>Implementation and Mitigation Strategy</b>	<p>A riparian strip at least 75 m wide adjacent to riparian and non-riparian wetlands will be protected.</p> <p>Cessation of all activities within wetlands that may disturb or destroy nests or eggs during the breeding period of migratory birds, namely from May 1 to August 31.</p> <p>In situations where the first measure cannot be implemented (mainly regarding overlap with pits), the second measure must be complied with, and clearing and the destruction of wetlands must be conducted outside the breeding period of the Rusty Blackbird which takes place during mid-may month.</p> <p>Buffer zones of at least 100 m will be maintained from the high watermark of all water bodies to protect riparian and aquatic</p>

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habitat.

A buffer zone of at least a 15 m buffer of undisturbed vegetation will be maintained along watercourses, wetlands or other ecologically sensitive areas. In areas with slopes exceeding 30%, fish habitat protection guidelines may be used to determine the buffer width, which can be calculated using the following equation from Gosse et al. (1998): Buffer Width (m) = 20 m + 1.5 x slope (%).

As a general rule, vegetation will be cleared outside the breeding seasons of

Migratory birds and raptors. During the nesting season, if the nest of any migratory bird or raptor is discovered, no clearing will be permitted within 800 m of it. Outside of the nesting season, clearing will not be permitted within 200 m of a known nest.

Work will be avoided when possible during critical periods for fish (e.g., spawning, incubation, fry rearing), as well as critical areas (e.g., spawning). Between Sept 1st and June 15th, stream crossing construction activities taking place within fish habitat will be undertaken under direct supervision of the Environment Representative.

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<b>Monitoring</b>	<p>Monitoring of vegetation health adjacent to the construction site will be undertaken during and after construction;</p> <p>Contractors will carry out semi-annual qualitative (visual) inspections to evaluate the effectiveness of the reclamation and re-vegetation programs.</p>
<b>Reporting</b>	<p>Reporting Contractors will clearly define, on construction plans, the limits of the zones to be deforested and the zones reserved for the construction activities, as well as the assigned project limits;</p> <p>Contractors will submit the results of monthly and semi-annual inspections to the EPCM Management Team within two weeks of the inspections.</p>

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<p><b>Identification of Incident or Failure to comply</b></p>	<p>An incident will be defined as the non-planned clearing/removal of vegetation or another activity involving the immediate destruction of a large quantity of vegetation or natural habitat, apart from the indicated clearing zones;</p> <p>Neglecting to conform to the mitigation measures defined in the EIS or in this control plan will constitute non-conformity to the needs for the reports;</p> <p>A non-conformity can occur in the following ways: deterioration of the plants surrounding the construction site; poor plant growth; and fish or animal mortality near or immediately downstream of the project area.</p>
<p><b>Corrective Action</b></p>	<p>In the event of an incident, Contractors will immediately determine the cause and make the necessary provisions in order to mitigate its environmental impacts;</p> <p>Regulatory authorities will be contacted by TSMC staff as appropriate;</p> <p>Contractors will immediately correct any nonconformity to the mitigation measures identified in the EIS or this control plan;</p> <p>Contractors will review plans and methods in order to</p>

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	determine if they should be modified so that similar incidents or nonconformities can be prevented from reoccurring.
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**5.8. Incidents and complaints control plan**

<b>Objectives</b>	To manage environmental incidents and complaints regarding the construction and operation of the project.
<b>Performance Requirements</b>	<p>Incidents and complaints are minimised and mitigation measures are implemented to decrease the frequency of complaints over time;</p> <p>Immediate action undertaken as soon as possible and within 24 hours of receipt of a complaint;</p> <p>Investigations completed within 7 days of receipt of a complaint;</p> <p>All corrective actions implemented by the due date.</p>
<b>Implementation and Mitigation Strategy</b>	<p>The EPCM Team will document all incidents and complaints in an incidents/complaints registry;</p> <p>The EPCM Management Team will ensure that the Incident Reporting Form documents at least the following information:</p>

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	<p>Time, date and nature of complaint;</p> <p>Type of communication (telephone, letter, visit);</p> <p>Name, contact address and contact information (if provided);</p> <p>Response and investigation undertaken as a result of the complaint; and</p> <p>Action taken and signature of person investigating complaint.</p>
<b>Monitoring</b>	<p>Contractors will maintain an incidents/complaint registry and ensure all complaints are resolved.</p> <p>Contractors will check their complaint register a minimum of every two weeks to ensure follow-up action has been taken to resolve each issue.</p>
<b>Reporting</b>	<p>Contractors will provide the Environment Representative with access to their complaint register as well as the status of outstanding complaints;</p> <p>Contractors will provide the HSE Manager with a quarterly summary of all new, open and closed incidents and complaints.</p>
<b>Identification of Incident or Failure to comply</b>	<p>Incidents/Complaints of an environmental nature not reported within 24 hours.</p>

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<b>Corrective Action</b>	<p>Contractors will provide the Environment Representative with access to their complaint register as well as the status of outstanding complaints;</p> <p>Contractors will provide the HSE Manager with a quarterly summary of all new, open and closed incidents and complaints.</p>
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### 5.9. Training Control Plan

<b>Objectives</b>	To ensure that any training requirement arising as a result of the PEMP is adequately managed.
<b>Performance Requirements</b>	The workforce is adequately trained to do required tasks.

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**Implementation and Mitigation Strategy**

Contractors will provide on-going training programs and will send staff to regular refresher courses as required by standard industry best management practices and applicable regulations;

Contractors will train employees on the hazards, precautions and procedures for the safe storage, handling and use of all potentially harmful materials relevant to each employee's task and work area;

Contractors will train the personnel in environmental, and health and safety matters including accident prevention, personal protective equipment, safe chemical handling practices, proper use and maintenance of equipment and facilities, and personal behaviour (recycling, housekeeping, etc.);

Contractors will ensure that training also includes emergency response, including the location and proper use of emergency equipment, use of personal protective equipment, procedures for sounding the alarm and notifying emergency response teams, and proper response actions for reasonably foreseeable emergency situations;

Contractors will maintain up-to-date documentation

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	describing which staff members have received which type of training, and when the training expires.
<b>Monitoring</b>	Contractors will assess the success of their respective training programs based on the number and ability of the graduates to meet work requirements.

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<b>Reporting</b>	<p>Contractors will prepare their respective Health and Safety, and Environment Training Plans before their staff commences on-site activities to ensure that all of its workers are adequately trained;</p> <p>Contractors will maintain records of their staff's skills and training and compare those training records with accident and incident reports to determine whether further training programs are necessary.</p>
<b>Identification of Incident or Failure to comply</b>	<p>Failure to comply will be evidenced by either Contractors not having prepared their Health and Safety, and Environment Training Plans as required or by those plans being inadequate as evidenced by workers not receiving the appropriate training and hence not able to perform their jobs safely or at an appropriate skill level.</p>
<b>Corrective Action</b>	<p>Environmental Representative will work with contractors to ensure that adequate training issues are resolved.</p> <p>Contractors will provide the HSE Manager with a quarterly summary of all new.</p>

**5.10. Waste Management Control Plan**

<b>Objectives</b>	<p>To manage waste from the construction of the project in such a way that any potential impacts on the environment are minimized or avoided.</p>
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<b>Performance Requirements</b>	<p>Waste related impacts are prevented;</p> <p>Practice good waste management practices by:</p> <p>Minimizing waste generation;</p> <p>Maximizing water and materials reuse and recycling.</p>
<b>Implementation and Mitigation Strategy</b>	<p>Source reduction (<i>i.e.</i>, reducing the volume of materials arriving on site that eventually ends up as waste) will be undertaken wherever possible and feasible.</p> <p>Material Safety Data Sheets (MSDS) are required for all potentially hazardous materials, including petroleum products, imported to the site.</p> <p>A list of all materials and chemicals (and their volumes) must be kept. This list must be reviewed annually to determine if substitutes can be used that are less hazardous and/or less waste-producing.</p> <p>Contractor will collect separately and re-use or recycle all</p>

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recyclable building wastes, such as:

Timber from concrete form work that can be recovered and reused;

Scrap steel and off cuts that can be recycled

Used oils will be collected and sent to an accredited facility for proper disposal.

The following containers will be stored together prior to off-site shipment for recycling:

Aluminum and steel cans – juice and soft drink

Plastic bottles – water, juice, soft drink

Tetra Pak & Gable top cartons – juice, but not milk cartons

Used tires (24 ½ inches in diameter and smaller). Non-recyclable tires will be stored separately and used as road dividers or safety barricades, as necessary. Any remaining oversized tires will be landfilled.

Recyclable scrap metal. Any non-recyclable metal will be disposed of in the landfill.

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	<p>Contractors will segregate and characterize waste streams to facilitate waste reduction and recycling.</p> <p>To achieve waste separation at source bins for re-usable and recyclable materials will be provided by the Contractors. For large quantities of waste, an on-site area will be allocated for the collection of materials.</p> <p>Dry materials (construction debris) will be placed in the site's dry materials landfill.</p> <p>Contractors will develop good housekeeping procedures and workforce</p>
<b>Monitoring</b>	<p>Quantities of waste being sent for reuse, recycling and disposal will be monitored on a monthly basis.</p> <p>During construction, both waste and reusable and recyclable materials storage areas will be monitored on a weekly basis to ensure that they are emptied when required.</p>

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<b>Reporting</b>	<p>Contractor will review and adhere to TSMC's <b>Waste Management Plan</b> and <b>Landfill Operations Manual</b> including:</p> <p>The scope and objectives of the plan;</p> <p>Environmental values to be protected;</p> <p>Opportunities and actions to be taken to implement the "5 R's" (reduce, reuse, recycle, recovery, residual disposal) of waste management;</p> <p>Emergency response procedures;</p> <p>Training and management;</p> <p>Monitoring and reporting</p> <p>Contractors will be responsible for waste collection and waste management issues and will report any issues to the Environment Representative</p>

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<b>Identification of Incident or Failure to Comply</b>	<p>The following constitute incidents or failures to comply in relation to waste management policies:</p> <p>Illegal or uncontrolled waste disposal;</p> <p>Burning combustibles;</p> <p>Other non-compliance with the Waste Management Plan;</p> <p>Poor housekeeping; and</p> <p>Failure to comply with provisions in the Waste Management Plan and Landfill Operations Manual.</p>
<b>Corrective Action</b>	<p>Should an incident or failure to comply occur, TSMC's Environment Coordinator will take the necessary actions to identify the causes of non-conformance with the Waste Management Plan and implement any actions necessary to ensure future compliance.</p>

**5.11. Chemicals, Fuels, and Hazardous Materials Control Plan**

<b>Objectives</b>	To safely manage and dispose of these product and prevent their uncontrolled release to the environment.
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<p><b>Performance Requirements</b></p>	<p>Flammable and combustible liquids and dangerous goods are stored and handled in compliance with relevant standards;</p> <p>No chemical or other product are released to the environment during the construction and mining activities;</p> <p>Adherence to the Emergency Response Spill Contingency Plan (Appendix C);</p> <p>Record and compilation of all MSDS on site with the cooperation of the Health and Safety officer.</p>
<p><b>Implementation and Mitigation Strategy</b></p>	<p>Contractor(s) will store all hazardous (reactive, flammable, radioactive, corrosive and toxic) materials in clearly identified containers or vessels appropriate to the material contained;</p> <p>Contractor(s) will berm products stored in non-double wall aboveground tanks to contain at least 110% of the largest tank. Contractor(s) will also berm (or otherwise confine) chemicals stored in drums to contain at least 25% of the maximum stored quantity of chemicals. All diking and secondary containment will have impervious lining</p> <p>Contractor(s) will segregate chemicals in accordance with</p>

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their compatibility. Otherwise, hazardous materials must be segregated according to procedures prescribed by legislation;

Contractor(s) will clean up spills immediately. Contractor(s) will also collect and remediate or dispose of contaminated runoff and contaminated soil through site disposal measures (consult with the Environment Representative);

Contractor will maintain an Emergency Response Spill Contingency Plan; ensure the availability of emergency equipment to deal with accidental spills; and train workers for the implementation of the emergency plan at the project site;

Contractor will implement surveillance and control measures for the transshipment, handling, and the storage conditions of hazardous goods at the construction site;

Contractor(s) will ensure that staff is trained in appropriate handling, storage and containment practices for all products as is relevant to their jobs;

Refuelling of vehicles should be performed at designated refuelling areas that are isolated from the surrounding and underlying soils;

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	<p>Implement design controls to ensure the transfer of fuels and chemicals is managed to reduce the risks of spills, in particular outside the bermed areas;</p> <p>All aboveground fuel storage, refuelling and wash down areas will be fully bermed with oil-water separators discharging to a sedimentation pond.</p>
<b>Monitoring</b>	<p>Contractor(s); with the Environment Representative, will inspect and document the condition of bulk and packaged chemicals containers and bermed areas on a regular basis. Potentially contaminated storm-water will also be monitored for contaminants to determine disposal options</p>
<b>Reporting</b>	<p>The Environment Representative will record and sign off on regular inspections of containers, integrity of berms, valves and storage and handling areas;</p> <p>Contractors will ensure that any spill will be reported to the Environment Representative including actions taken to minimise the impacts;</p> <p>Should an uncontrolled release to the environment occur, Contractors should follow the Emergency Response Spill Contingency Plan.</p>

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<p><b>Identification of Incident or Failure to comply</b></p>	<p>The following constitute an incident or failure to comply in relation to chemical and dangerous goods management:</p> <p>Significant chemical spills; Storage areas not meeting the Standards; Chemicals stored in areas not containing suitable berms; and Release of hazardous chemicals or materials to the environment.</p>
<p><b>Corrective Action</b></p>	<p>Should a chemical spill occur, a selection of the following corrective actions will be undertaken as appropriate:</p> <p>Contractor will contain and clean up spill material immediately and remediate or appropriately dispose of contaminated material Contractor will repair berms; Contractor will relocate chemicals to appropriately bermed or approved storage areas; In the case of a significant spill, Contractor will follow the Site Emergency Plan; and EPCM Consultant will review the Chemicals, Fuel and Hazardous Materials Management Plan on regular basis to ensure consistent application and controls are in place.</p>

**5.12. Silica Control Plan**

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<b>Objectives</b>	To safely manage and control silicate dust exposure during construction and mining activities at the DSO Timmins Site.
<b>Performance Requirements</b>	<p>Workers must not be exposed to TLV (Threshold Limit Value of 0.025 (mg/m<sup>3</sup>) without mandatory PPE, briefing, engineered controls.</p> <p>All workers must be notified when silicate level exceeds 0.5 TLV, with PPE optional.</p> <p>All instances of recorded silicate dust exceeding TLV must be reported to OHS.</p>

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**Implementation and Mitigation Strategy**

Work must be designed so as to identify where silica dust may be generated;

Operations should be minimized near workers on foot;

Equipment should be selected with enclosed positive-pressure cabs with air conditioning and filtered air-supply to isolate the operator from dust. Equipment with heaters or air-conditioning vents on the floor should be avoided;

Equipment must also use efficient air filtration systems to capture dust generated by the operator or other sources inside the cab;

Dust control equipment must be properly maintained in good working order through regular inspection;

Regular scheduled maintenance regimens will be established to maintain both equipment and dust control equipment; and

Respiratory protection shall be provided to the employee by the employer upon request. The equipment provided by the employer must be; appropriate for the concentration of airborne silica, meet the requirements of the Silica Code of

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	<p>Practice, and be provided, maintained and inspected in accordance with CSA standards.</p>
<p><b>Monitoring</b></p>	<p>An independent consultant will be contracted to visit site four (4) times per year and measure the dust on site. Dust monitoring will occur at several areas of the site; both on persons working in enclosed equipment and those working outside. The results of these tests will be made available and discussed immediately upon receipt.</p>

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<b>Reporting</b>	The Environment Representative will coordinate site visits with the silicate testing consultant. Reports will be completed including all pertinent information regarding equipment placement, techniques, analysis, and results
<b>Identification of Incident or Failure to comply</b>	<p>The following constitute an incident or failure to comply in relation to silicate management;</p> <p>Failure to report silicate test results of 0.5 TLV or higher; Failure to provide appropriate PPE when requested, or when TLV is met; Direct exposure to silicate levels above TLV. Defective silicate control equipment (sprayers, etc.).</p> <p>Faulty PPE or silicate control equipment be detected; the detecting party shall notify the Environment and Health and Safety teams or designate.</p>
<b>Corrective Action</b>	<p>Should faulty PPE or silicate control equipment be detected; The detecting party shall notify the Environment and Health and Safety teams or designate.</p> <p>Should a silicate level in excess of TLV be noted; Existing control equipment in place should be re-evaluated; Levels must be noted and followed-up on; PPE mandatory and enforced; OHS informed;</p>

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	Consideration be made for stopping work until an engineered solution can be implemented.
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**5.13. Safe Blasting Control Plan**

<b>Objectives</b>	To ensure that blasting is done by certified persons(s) in a manner which will adversely affect the environment or human life.
<b>Performance Requirements</b>	Blasting must not violate provincial or federal legislation on training, transportation, use and storage of explosive material;  Blasting must not interfere adversely affect environmental concerns such Caribou and fish.
<b>Implementation and Mitigation Strategy</b>	All personnel involved with blasting operations must hold current certification pertinent their respective roles;  All drivers must be TDG certified and trained in the safe handling of explosives;  All explosives and detonators shall not be stored together in a magazine;

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No driller shall drill a hole within the prohibited radius from any loaded hole;

Driller must ensure PPE is worn properly at all times, and that the work surface is clean and bare prior to working;

Controlled blasting (mats, blast design, and adequate collar) shall be required when the blasting is to occur in the vicinity of overhead or underground hazards or structures;

All blasting equipment and persons must be immediately removed and the blast suspended immediately at the first indication of an electrical storm; and

Mobile radio transmitters shall be kept well away from areas of electrical blasting, and signage shall indicate the same;

Blasting shall be planned so as to ensure the last blast of the day occurs one hour before sunset. Prepared holes should not be left for a significant period of time or overnight unless guarded. If such provisions are made, the area must be safely cordoned off and continuously patrolled, while tying-in of the devices must not occur until immediately prior to firing.

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	Detonation process must be formally identified and followed without deviation while the on-site must be made clear on procedure
<b>Monitoring</b>	The blasting contractor and Health and Safety designate will together ensure safe blasting procedures are followed with regular checks to ensure compliance with all pertinent provincial and federal legislation and internal documents
<b>Reporting</b>	The certified blaster must keep on file all documentation from blasting operations included the technical specifics of each blast and report them as required to government authorities
<b>Identification of Incident or Failure to comply</b>	<p>In the event of an issue with non-compliance, the offending party is to be briefed correct procedures and reprimanded should they continue. Documentation of the often is to be recorded.</p> <p>In the event of an incident in which an individual is injured or otherwise harmed, all work shall cease until such time as an investigation shall be completed</p>
<b>Corrective Action</b>	In the event of an issue with non-compliance, the offending party is to be briefed correct procedures and reprimanded should they continue. Documentation of the often is to be recorded.

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	In the event of an incident in which an individual is injured or otherwise harmed, all work shall cease until such time as an investigation shall be completed.
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**5.14. Bear Management Control Plan**

<b>Objectives</b>	Minimize exposure to bears on site.
<b>Performance Requirements</b>	Have no due harm to life or property due to bears Have no harm be done to bears.
<b>Implementation and Mitigation Strategy</b>	<p>All personnel on site will receive a site specific orientation which will include bear safety and safety procedures as well as regular updates on bear sightings.</p> <p>All personnel on site will minimize bear attractants wherever possible by not leaving food products outside or where they may be easily accessed. This includes lunch wrappers, waste food material, etc.</p> <p>All bear encounters on site will be documented by the environmental team.</p> <p>In the event that a bear becomes an issue on camp, escalating force will be used to deter its presence. At the initial onset, attempts will be made to scare the bear away using loud noises, yelling, etc. Should these methods cease to work, bear-bangers or other devices</p>

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	<p>shall be used.</p> <p>Contractors will not permit its employees to engage in hunting, fishing, or feeding animals on the project site or on adjacent lands.</p> <p>Plans will be developed to educate construction workers concerning the impacts on animals. Construction workers will be prevented from transporting or keeping pets in captivity.</p> <p>If it is not known whether a given group of caribou belongs to the migratory or the sedentary ecotype, site workers assume that they are sedentary caribou and will act accordingly.</p> <p>Deterrent measures will be used before more lethal means are used. This may include flags, streamer tape, scarecrows or boats with human-like dummies for migratory birds. Propane cannons, blank pistols or pyrotechnical pistols firing cracker shells at a velocity less than 495 feet per second, which do not require a permit, may also be used.</p> <p>Any bear that has been killed will have its head removed, frozen and submitted to the Wildlife Division. Local communities will be notified to determine if any member of the local community can utilize the remains.</p> <p>Firearms are prohibited in the workers' camp, except for two that may be used by security personnel in a case of</p>
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	emergency.
<b>Monitoring</b>	All bear encounters are to be recorded by the environmental team. The security team shall respond and follow-up all reported bear sightings The security team shall continue to monitor all bears until they depart the site.
<b>Reporting</b>	All staff and contractors will be briefed and are responsible for reporting bear encounters security on channel 2.
<b>Identification of Incidents or Failures to Comply</b>	Any bear sighting or encounter is to be considered an incident. Any staff or contractor failing to adhere to the aforementioned safety procedures constitute a failure to comply.
<b>Corrective Action</b>	Written or verbal warning provided to those in violation of safety protocols

### 5.15. Cultural Heritage Control Plan

<b>Objectives</b>	To protect any cultural heritage resources that could be impacted by construction activities.
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<b>Performance Requirements</b>	No material or site of cultural heritage value is disturbed by construction activities unless the site has been documented and preserved in accordance with regulatory requirements.
<b>Implementation and Mitigation Strategy</b>	<p>Contractors will provide training to its supervisors and heavy equipment operators on any likely types of culturally important sites that could be encountered and procedures to ensure that the sites are not further disturbed until a Provincial Archeologist and the local First Nations have been notified. Contractor will review and adhere to TSMC Cultural Heritage Procedure presented in appendix A-26.</p> <p>Work boundaries may be moved to protect cultural objects. A 50 m buffer zone will be created around the discovery site until further notice by regulatory authorities.</p> <p>In the instance of discovery of historic resources, the Environment Representative is to be contacted first, followed by the TSMC Environmental Specialist, who will then contact the Provincial Archaeologist at the Provincial Archaeology Office (PAO) at (709) 729-2462, fax (709) 729-0870. Reporting information will include:</p>

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Nature of material discovered;

Precise location of the find.

The discovery area will be cordoned off for the duration of the project, or until the finding is determined to be not significant by the Province. Under no circumstances:

Will work be carried out at the location of the discovery;

Will not remove material unless authorized under a written permit.

In the event of the discovery of suspected human remains or a burial site, the procedures outlined below will apply:

Work in the immediate area will be suspended and the on-site Project Managers and the Environment Representative will be notified immediately;

If remains are found during operations by heavy equipment, the equipment will not be moved by the Contractor, as physical evidence may be destroyed; and

The site, including heavy equipment, if necessary, will be secured by the Contractor with flagging tape or some other appropriate

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	<p>means. The suspected remains will be covered with a tarp.</p> <p>If blasting is necessary within the vicinity of an archaeological site, precautions shall be taken to ensure that blasted material and shock waves do not disturb any part of the site. If necessary, protective covering shall be applied to the site under the supervision of an approved archaeologist. Blasting shall not be undertaken in these areas without notifying the on-site Project Managers.</p>
<b>Monitoring</b>	TSMC Environment and Community affairs department to monitor all major earthwork operations and investigate all reported cultural heritage items.
<b>Reporting</b>	A report will be completed by the on-site Project Manager/Environment Representative and Environmental Specialist with the following information: cultural objects discovered; parties notified; procedures followed to protect the object, as per the Cultural Heritage procedure presented in appendix A- 26.
<b>Identification of Incident or Failure to</b>	Failure to notify the EPCM Team of the discovery of culturally significant materials.

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<b>Comply</b>	
<b>Corrective Action</b>	Contractors will immediately notify the EPCM Team of any disturbance of culturally significant materials and implement training necessary to avoid future disturbances.

**6.0. Contingency Plans**

This section provides an overview of the various contingency plans for unplanned and accidental events. The contingency plans themselves are contained in Appendix B, and are meant to be stand-alone documents. The following is a list of the contingency plans contained in Appendix B:

- B-1 Hazardous Materials: Storage, Handling and Emergency Response
- B-2 Wildlife Encounters
- B-3 Discovery of Historic Resources
- B-4 Forest Fires
- B-5 Extreme Weather Conditions
- B-6 Emergency Response Plan
- B-7 Waste Management Plan

In the case of an accidental event, the immediate Supervisor on duty will be informed, and the Supervisor will notify the appropriate emergency services through the

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appropriate chain of command. Emergency response generally includes:

1. Accurately defining the problem;
2. Identifying what material is involved;
3. Determining if an evacuation is necessary, and in what direction;
4. Ensuring first responders have been notified, and supplying them with relevant medical information;
5. Ensuring all workers and public are controlled at a safe distance from the emergency; and
6. Ensuring responders through their respective chain of command know plans prior to acting.

In the event of an incident, an Incident Investigation Report (Appendix F) will be completed by the direct Supervisor (or designate) and submitted to the HSE Department.

**6.1 Environmental Response Plan**

The Environmental Emergency Response Plan or ERP is a separate distinct document and as such should be consulted separately. A copy of the ERP is available both on-site and at TSMC's corporate headquarters in electronic and paper formats. An electronic copy of the Environmental Response Plan is also available in this document, see Appendix G.

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**6.2 Landfill Emergency Plan**

Details surrounding the Emergency Plan shall be found in the standalone document “Waste Management Plan” or WMP found in Appendix B.

**6.3 Spill Management**

**6.3.1 Spills and Leak Prevention/Mitigation**

- Spill kits will be located in close proximity to areas of risk, including storage sites of hazardous materials, parking areas, and refueling locations.
- The Emergency Response Spill Contingency Plan will be given to Contractors before work begins. Contractors must make the manual available to employees and ensure they are aware of the emergency measures, their responsibility, and the importance of responding quickly when a spill occurs.
- Contractors must have a sufficient number of Spill Response Kits with contents approved by the Environment Representative.
- Contractors must contact The Environment Representative immediately in the event of an environmental incident and apply the procedures set forth in the Emergency Response Spill Contingency Plan without delay.
- Machinery must be checked on a daily basis for leakage of lubricants or fuel, and must be in good working order with special attention given to machinery working near watercourses.

**6.3.2. Spill Reporting**

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Spill reporting requirements are listed in the Emergency Response Spill Contingency Plan, Appendix C.

**6.4. Tailings Management Contingency Plan**

Emergencies relating to operation of the tailings management system should be referred to the standalone document “Tailings Management Handbook” in appendix B.

**6.5. Septic Emergency Plan**

Small wastewater spills (i.e. less than 1m<sup>3</sup>) can potentially happen as a result of an overflow from the holding tanks used to collect sewage prior to entering the Wastewater Treatment System. Damage to a sewage pipe leading to the system or an accidental discharge from the Vac-Truck could also result in a small spill. The following measures should be taken in the event of a small sewage spill:

1. Ensure your personal safety (i.e. that you don’t come in contact with the spill). Wastewater is considered a biohazard.
2. If possible, stop the release. If the release occurs from one of the holding tanks, transfer part of the contents to another holding tank or, if not possible, to a secondary containment such as 1000L totes. If the release occurs from a damaged pipe, close the upstream and downstream valves closest to the damaged area.
3. Once the release is stopped, spread powdered lime over the affected area in order to disinfect and stabilize the soil.
4. Cover the area with clean fill.

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Larger wastewater spills (greater than 1m<sup>3</sup>) can potentially happen as a result of accidental release from the Vac-Truck or damage to the latter following a vehicular accident. Damage to a sewage pipe during peak consumption hours or damage to one of the holding tanks could also result in a large spill. The following measures should be taken in the event of a large spill:

1. Ensure your personal safety (i.e. that you don't come in contact with the spill). Wastewater is considered a biohazard.
2. If possible, stop the release. If the release occurs from a damaged pipe, close the upstream and downstream valves closest to the damaged area.
3. Prevent the spilled wastewater from entering ditches and watercourses. Ditching and berming can be used for this purpose. If the wastewater has already entered a ditch, temporarily block the ditch in order to contain the spill.
4. Any pooled wastewater should be picked up with the Vac-Truck if possible and stored in containers (1000L totes, small holding tank, etc.) to be sent out for off-site treatment. The presence of a large quantity of soil and gravel would make treatment in the on-site system impossible.
5. Once all pooled material has been removed, cover the affected area with powdered lime.
6. Cover the affected area with clean fill.

**7.0 Key Contacts**

Below is a list of emergency contact numbers. These numbers will be updated to

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include key Project personnel, and other important emergency contacts. It is the responsibility of the Operations Manager to ensure that these contacts are updated and posted in a visible, central location.

- TSMC Security (418) 585-2128 ext.399
- Safety (418) 585-1233
- Ambulance (418) 585-2055
- Police (418) 585-2626
- Fire (418) 585-2463
- Clinic (Day) (418) 585-2645
- (Night) (418) 585-2646
- Environmental Emergency Service (Quebec) 1 (866) 694-5454
- Loic Didillon (Senior Manager-Environment and Permitting) (514) 764-6705
- Environment Office (Schefferville) (418) 585-8224
- RCMP (Province wide ) 1 (800) 709-7267
- Wildlife Division (Wabush) (709) 282-6881 or (709) 282-2052
- Federal Contacts:
- Canadian Transport Emergency Centre (613) 996-6666
- Canadian Coast Guard Guard Spill Line (any spills > 70 L) 1 (800) 563-9089

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**Appendix A-1 Storage, Handling and Transfer of Fuel**

**Operational Aspects**

For the project, a rail-loading fuel farm will be operational. Fuel will be brought to the site by rail. These tank cars will be double-walled, with a 5,000 L capacity, and will be registered under Section 13 (1) of the Storage and Handling of Gasoline and Associated Products Regulations, 2003. The NLDEC Pollution Prevention Division Guidelines (GD-PPD-042) regarding the Registration of Tank Trucks and Tank Truck Trailers Storing Hydrocarbons shall be followed. A fuel station will be in the proximity of the plant. Partial fueling station will be in operation in November 2014 and full fuel farm tank and fueling management will be ready in August 2015.

All on site fueling must follow the below procedures; subcontractors must comply with the general fueling procedure below:

**General Fueling Procedure**

1. Fueling is prohibited in all area in the distance of 60 m of any water bodies.
2. Fueling is permitted to all area outside of road around Timmins 1.
3. Avoid mobile fueling of mobile construction equipment around the site; rather, Fuelling must be done only in designated area.
4. With the exception of equipment such as bulldozers and large excavators, most

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vehicles should be able to travel to a designated area with little lost time.

5. Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area. Spill kit must be in place during fueling.
6. Fuel dispensing hose shall be certified as non-electrically conductive.
7. Nozzles used for vehicle and equipment fueling should be equipped with an automatic shutoff to control drips and prevent overfilling.
8. All vehicles /equipment engines must be turned off during refueling. All cell phones and any other sources of ignition must also be turned off.
9. The ground cable must be attached to all equipment before refueling.
10. Any employees, including subcontractor workers, shall be trained on proper fueling and cleanup procedures.
11. Only trained and qualified persons must handle fuel.
12. All fueling equipment shall be regularly inspected by TSMC and subcontractors. Any leaks must be reported and repaired without delay.
13. At all times, spill kit materials should be available at fueling areas and on fueling trucks. Used absorbent should be properly disposed according to waste management procedures.
14. Any spills or releases shall be immediately cleaned up by subcontractors. These incidents shall be reported according to Incident Reporting and Investigation procedures
15. Fueling operations should not be done without supervision.

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16. Fueling stations and trucks must be equipped with fire extinguishers.
17. Contractors must buy their fuel from authorized fuel distributing dealers.
18. NO SMOKING and turn OFF ENGINE signs shall be posted at all fueling stations.
19. Safe and adequate lighting shall be provided for night operations. An adequate storage rack for the flexible hose shall be provided.
20. Fueling operations should not be done without supervision. If the operator has to leave, the pump must be shutdown.
21. Overfilling is a common cause of spills. All precaution must be taken to ensure that storage tanks are not overfilled. The person filling the tank should be aware of the tank's capacity as well as how much fuel is already in the tank.
22. For petroleum product storage conditions, refer to the procedures included in the Hazardous Materials Management.

### **Fueling Using a Fuel Truck**

1. The truck shall be equipped only with a dedicated fixed tank for fueling
2. Do not fuel any vehicle/equipment where any hot work, open flames, or other spark and fire producing work is in progress.
3. The fuel truck shall be properly labeled according to regulation and labeled FLAMMABLE. Prior to fueling operations, the driver shall conduct a fuel truck inspection to ensure it meets all safety and operating requirements defined by TSMC or subcontractor.
4. All inspections shall be compiled and provided to TSMC.

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5. If repairs are needed, the fuel truck shall be taken out of service. The truck shall not be used until all repairs have been completed and documented.
6. The fuel truck is exclusively and strictly used for fueling. Any other product must not be transferred in the tank.
7. The fuel truck designated driver shall receive appropriate spill response training by the subcontractor.
8. At all times, the designated driver shall operate the fuel truck in a safe manner. If unsafe practices are observed, the driver shall be removed from fuelling activities without delay
9. When not use, the fuel truck shall be parked in a safe area.
10. The fuel truck shall be secured on-site after completion of fueling operations.
11. The driver shall check that the tanker fill cap is in place to prevent spillage as well as rainwater accumulation into the tanker.

### Inventory and reporting

A monthly fuel report log must be completed. The following information must be included in this report:

- Type of Fuel;
- Fuel supplier
- Quantity supplied.

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**Appendix-A-2-Storage, Handling and Transfer of Hazardous Materials**

**Operational Aspects**

Fuel and other hazardous materials require proper storage and safe handling procedures during refueling and transfer to protect the environment and workers from hazards associated with the materials.

Typical hazardous materials that may be used on-site during operations activities include, but are not necessarily limited to:

- Petroleum, oil and lubricants.
- Chlorinated and non-chlorinated solvents (e.g., cleaner-degreasers).
- Flammable gases (e.g., acetylene).
- Waste petroleum products (e.g., used engine/motor oil)
- Corrosives (e.g., sulfuric acid).
- Glycol (e.g., antifreeze).
- Paints.
- Epoxies.
- Concrete additives.
- Explosives for site work.

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- Calcium Chloride
- Surfactants such as Plurafac
- Caustic starch
- Quicklime
- Amine DA-16
- Methyl Isobutyl Carbinol
- Polymers

### Environmental Concerns

The uncontrolled loss of fuels and other hazardous substances can lead to water quality degradation in both surface and groundwater systems, impact aquatic and terrestrial habitat and species and create soil quality issues. There is also a concern with overall human health and safety when storing, handling, and transferring fuel and other hazardous materials.

### Environmental Protection Measures

This appendix is a general introduction to fuel and other hazardous materials. TMSC has developed and implemented a Hazardous Materials Management and Emergency Response Plan “Fuel and Hazardous Materials: Storage, Handling, and Emergency Response” which is located in Appendix B-1. Appendix B-1 outlines the details of the storage facilities, provides an inventory of the amounts and types of hazardous materials on-site, and outlines detailed steps for environmental protection and

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emergency response.

**Appendix A-3 Blasting and Drilling**

**Operational Aspects**

Blasting, preceded by drilling and heavy equipment operation will be required to extract the ore from the open pits and is expected to take place approximately every 10 days. Charges will be set sequentially so as to reduce dust emissions. Blasting will take place under contract by the explosives supplier. TSMC will give the final authorization to blast after a check-list is completed by the explosives supplier.

**Environmental Concerns**

Blasting and drilling can lead to the disturbance and destruction of vegetation and historical resources, and cause noise disturbances to wildlife and humans. Blasting in or near water can affect organisms with swim bladders (fish) but may also affect a variety of other aquatic organisms and their habitat. The introduction of silt and residual blast material into the water column is a concern for water quality and related impacts on aquatic life.

**Environmental Protection Measures**

The handling, transportation, storage and use of explosives and all other hazardous materials shall be conducted in compliance with all applicable laws, regulations, and orders of the NLDEC, the NLDGS, the NLDNR, the GNL Dangerous Goods Transportation Act and the Government of Canada Transportation of Dangerous Goods

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Act. On-land blasting will comply with the terms of DFO's Guidelines for the Use of Explosives in or near Canadian Fisheries Waters (Wright and Hopky 1998). The following measures shall be implemented to minimize the effect of drilling and blasting:

1. Drilling shall utilize best environmental techniques and drilling equipment shall have muffled exhaust to minimize generated noise.
2. Prior to blasting, pit water will be discharged to sedimentation ponds to ensure that it does not enter natural water bodies. Dewatering environmental protection measures are provided in Appendix A-4.
3. Blasters Safety Certificates from the Department of Labour and, if required, the Temporary Magazine License from Natural Resources Canada (NRCan) shall be obtained prior to blasting. Only those properly trained and qualified will be responsible for the handling and detonation of explosives, in accordance with the manufacturer's instructions and laws and regulations.
4. Explosives shall be used in a manner that will minimize the scattering of blasted material beyond the limits of the pre-defined area, thus minimizing damage or defacement of landscape features, trees, ecologically sensitive areas such as wetlands, and surrounding objects by controlling through the best methods possible (including precisely calculated explosive loads and adequate stemming).
5. Prior to blasting in areas that have not been cleared, inadvertently damaged trees shall be cut, removed and salvaged if merchantable (see Appendix A-18).
6. Multiple in-hole delay primers and optimized drillhole patterns shall be used as recommended by the explosives manufacturer to minimize misfires.
7. Bore hole collars shall be filled with clean crushed stone to help suppress dust and gasses during blasting.

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8. Blasting patterns and procedures which minimize shock or instantaneous peak noise levels shall be used. Peak noise levels at the workers' camp are not anticipated to be greater than 90 dB. Blasting will be carried out in such a way as to ensure that sound levels at the receptors (habitations) are lower than 128 dB.
9. Blasting mats will be used to prevent excessive fly rock. Time delayed blasting cycles will be used, as recommended by the explosives manufacturer, to prevent cut-offs. Fly rock that inadvertently enters a water body, watercourse or any ecologically sensitive area shall be removed if possible.
10. Prior to a blast, unsupervised equipment shall be moved to at least 300 m from the blast site, and personnel shall be evacuated to at least 1,500 m.
11. Blasting shall not occur in the vicinity of fuel storage facilities. The immediate area of the blast site shall be surveyed within three hours prior to a blast and operations will be curtailed if sensitive animals such as large mammals (e.g., Black bears, caribou) are observed within 500 m. Any individual animal sightings shall be recorded and reported to the authorized individual.
12. If blasting is necessary within the vicinity of an archaeological site, precautions shall be taken to ensure that blasted material and shock waves do not disturb any part of the site. If necessary, protective covering shall be applied to the site under the supervision of an approved archaeologist. Blasting shall not be undertaken in these areas without notifying the Operations Manager.
13. Explosive remnants must be recovered and disposed of appropriately directly after each detonation.

**Blasting in Close Proximity to Water bodies**

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1. No explosives will be used directly in or near water. In the event that blasting is considered absolutely necessary within a water body, it shall be undertaken in compliance with the required Water Resources permits from the NLDEC and DFO's guidelines (Wright and Hopky 1998).
2. Shortly before a detonation in the vicinity of a watercourse, small "scare charges" must be detonated to scare off fish.
3. Blasting activities shall be undertaken in a manner that ensures that the magnitude of explosions is limited to that which is absolutely necessary. A blasting plan shall be reviewed with the local DFO officers in advance of work in close proximity to water bodies.
4. Detonations producing an instantaneous pressure change of more than 100 kPa in fish air bladder are prohibited in or close to fish habitat.
5. Detonations producing or likely to produce a peak particle velocity of more than 13 mm/s are prohibited in rearing habitats at egg incubation time.

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**Appendix A-4 Dewatering of Work Areas**

**Operational Aspects**

Dewatering of work areas may be necessary during mining operations activities including preparation of the open pits, drilling and blasting activities, and maintenance and upgrading of infrastructure. Dewatering of work areas, such as watercourses, man-made trenches and excavations, may be required prior to undertaking any of the above activities.

**Environmental Concerns**

Dewatering of work areas, specifically lakes, ponds or streams, may create siltation to neighboring areas, and can have implications for freshwater fish species through direct mortality and/or habitat destruction.

**Environmental Protection Procedures**

During dewatering of work areas, special care will be taken to ensure no harmful alteration, disturbance or destruction (HADD) of fish habitat will take place. Any dewatering activity will be approved by the DFO Area Habitat Biologist prior to commencement, and the activities noted below will be followed:

1. Measures will be put in place to remove silt from water pumped from work areas to reduce turbidity before discharging. This may include settling ponds, filtration systems, silt fences and dykes where necessary.

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2. Effluent discharge will comply with the provincial Environmental Control Water and Sewage Regulations, N.L.R 65/03 under the provincial Water Resources Act.
3. Sedimentation ponds shall be designed to accommodate the anticipated volume of collected water and to meet discharge criteria.
4. Where possible, water from dewatering work areas will be released to vegetated areas to reduce effects. Mechanisms for the dissipation of energy shall be implemented to prevent scouring and erosion at the discharge location (i.e., impervious geotextile mats, perforated end-of-pipe, discharge to small settling sump). During high flow conditions, these discharge locations will be checked, and adjusted or stopped if they are not effective.
5. Measures will be implemented to ensure that discharged water will follow natural surface drainage patterns.
6. Contingency measures (Appendix B-5) to deal with extreme weather events (e.g., high runoff) will be put in place. This may include erosion prevention measures, such as sediment containment materials, silt fences, riprap, and straw bales, filter fabrics and designated equipment, which will be readily available to address emergency situations.
7. Weather conditions will be monitored and, prior to periods of anticipated high rainfall, settling ponds will be lowered to the possible extent and erosion and sediment management measures will be checked.

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**Appendix A- 5 Solid Waste Disposal**

**Operational Aspects**

Solid wastes are everyday wastes produced by humans and construction processes. For the purposes of the Project, an on-site sanitary landfill is located in the vicinity of Timmins 1 to manage solid wastes. A composting system is also present on site.

**Environmental Concerns**

Solid wastes are unsightly and can cause damage to the environment and to human health, and can cause potential conflicts between humans and wildlife.

**Environmental Protection Procedures**

Solid wastes will be contained and no solid wastes will be left at any work site. In general, solid wastes will be dealt with in accordance with the Waste Management Plan (Appendix E). The following protection procedures will also apply:

The operations phase of the DSO project is subject to the Environmental Protection Act (2006), and all solid waste will be handled according to this Act. Waste generated will be handled, stored, transported and disposed of in an approved site in accordance with all applicable acts, regulations and guidelines. In general, solid waste management will follow the Waste Management Plan developed for the site (Appendix E).

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Where possible, the following measures will be employed in descending order – reduction at source; reuse; recycling; and reclamation of solid waste. Products will be used up completely, bulk material used, and the exact quantity of products required will be accurately supplied in order to reduce pollution at the source. Solid wastes will be contained in animal-resistant containers, and disposed of in the sanitary landfill.

1. Recyclable waste will be collected in designated sites depending on type of waste.
2. Separate containers will be available at these sites for wood, scrap steel and metals.
3. Any leachate that is generated at the landfill will be collected and pumped to the tailings area where possible.
4. Hazardous wastes will be managed as per Appendix B-1.
5. Solid wastes, including debris from cutting or vegetation stripping, will not be disposed of in any watercourse or any type of aquatic habitat. Solid waste will be disposed of at a minimum of 100 m distance from any watercourse.
6. Burning of solid waste shall be prohibited.
7. Putrescible waste will be removed from the site daily.
8. All solid wastes shall be stored in an area to which wildlife, employees and community members do not have access.
9. Waste accumulated on-site prior to disposal shall be confined so that it does not pose an environmental or health hazard. Waste receptacles shall be installed at all active work areas for use by workers. They will be covered to prevent the escape of windblown debris and will be clearly labeled, and secured to prevent movement

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under severe weather conditions.

10. Waste contaminated by asbestos or other hazardous material shall be removed, packaged and disposed of in accordance with the relevant regulatory requirements by qualified personnel.
11. Any vehicles carrying waste off-site shall be secured to prevent wind blow or other loss of load during transportation.
12. Regular inspections of the work site will be undertaken by the direct Supervisor to confirm it is left free of trash and other wastes at all times.

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**Appendix A- 6 Wastewater and Sewage Disposal**

**Operational Aspects**

Wastewater and sewage from the camp is carried by pipeline and is retained by holding tanks located at the centralized treatment units. Wastewater from the processing complex and associated infrastructure will be retained in holding tanks, and pumped by vacuum truck and shipped to the centralized treatment units, utilizing Membrane Bio Reactor (MBR) technology. This treatment facility is installed near the workers’ camp.

**Environmental Concerns**

Improperly treated wastewater and sewage effluent released into the natural environment has the potential for negative effects on human health, drinking and ambient water quality and fish and fish habitat.

**Environmental Protection Procedures**

In Newfoundland and Labrador, the disposal of effluent is required to comply with the Department of Health and Community Services Guidelines and the Environmental Protection Act, Environmental Control Water and Sewage Regulations, 2003 N.L.R 65/03. The following protection procedures will also be followed:

1. An accredited waste transporter that holds the appropriate license shall be used.
2. Transportation of waste will occur in closed tanks, and waste volumes and storage

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locations will be properly recorded.

3. The sewage treatment facilities will be operated in conformance with the Certificate of Approval obtained from the NLDEC.
4. No untreated wastewater will be released to watercourses or wetlands.
5. Treated wastewater released to the environment will meet the Newfoundland and Labrador Environment Control Water and Sewage Regulations, 2003 N.L.R 65/03 and the GoC Metal Mining Effluent Regulations SOR 2002-222. Monitoring is required to ensure compliance with the regulations. This monitoring is outlined in the Certificate of Approval from the Pollution Prevention Division (NLDEC).
6. After the treatment of wastewater by MBR technology, the effluent will be released to the environment.
7. Dewatered sewage treatment sludge is to be disposed of in a sanitary landfill, or composted and stored to be used later for restoration activities.
8. Issues with sewage treatment facilities, including pipeline or system failures shall be immediately reported to the General Manager and the HSE Manager, or designates.
9. No sewage infrastructure will be located at the mine sites, but portable toilets will be made available, routinely inspected and maintained. Sanitary waste from portable toilets will be routinely disposed of by an accredited contractor to the central treatment plant.

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**Appendix A- 7 Water Supply**

**Operational Aspects**

The freshwater intake system will provide water to the freshwater and fire protection water tanks located at the processing complex. The freshwater source will be a well located near the processing complex.

The water tank at the processing complex will have a capacity of 1,250,000 L. The water will be filtered at the inlet of the tank to remove suspended solids and large contaminants, as it will also be used as gland seal water. The freshwater tank will feed the potable water treatment systems. A membrane filter unit (Nano filtration) will be used to provide potable water to the camp, the processing complex and the garage.

**Environmental Concerns**

Construction of groundwater wells can lead to a negative effect on the surrounding groundwater. Constructing the pumping station and the pipeline can have negative effects on the surrounding terrestrial environment, and possible effects on the surrounding water quality due to runoff and sedimentation.

**Environmental Protection Procedures**

1. TSMC will confirm that potable water meets all the Guidelines for Canadian Drinking Water Quality (Health Canada 2010). Bottled potable water will also be

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made available at key points around the site, especially where there are no buildings, such as at the mine site.

2. At-risk installations (processing complex, petroleum and chemical substance storage areas) shall be built and managed in such a way as to avoid any significant degradation of groundwater before and during mining operations.
3. Groundwater quality shall be monitored through the sampling of observation wells around at-risk installations (processing complex, petroleum and chemical substance storage areas).

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**Appendix A- 8 Dust Control**

**Operational Aspects**

The creation of dust is often a major issue during mining operations activities, and can be generated in relation to transportation and road upgrading activities, construction activities, as well as during the extraction, processing and transportation of ore.

**Environmental Concerns**

The environmental concerns associated with dust include the potential harmful human health effects through inhalation of dust particles and potential effects on aquatic ecosystems, waterfowl and vegetation.

**Environmental Protection Procedures**

Dust generated from operations-related activities shall be controlled to maintain acceptable air quality, using the following protection procedures:

1. Frequent applications of water by a water truck will be used to control dust generated on roads in the summer. The amount of water and timing of application will be determined by the contractor. It will not be applied when weather conditions are freezing which could potentially cause traffic hazards.
2. Minimal amount of water required to control dust will be applied such that surface runoff of sediment is avoided.

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3. Dry material will be moisture conditioned or covered to prevent blowing dust.
4. Only approved dust control agents will be used on roads. Dust control measures will be determined based on-site conditions and specific requests from regulatory officials and/or members of the public.
5. Waste oil shall not be used for dust control, but other agents such as wood chips, matting and re-vegetation will be considered on a site-specific basis. Where necessary, application of calcium chloride shall be in accordance with guidelines available from the Department of Works, Services and Transportation. Approximately a 30% calcium chloride solution will be used when necessary (mid May to the end of August), and will be applied at a rate of 1000 L/km.
6. Chemical dust control agents (other than water) shall be stored in areas away from water bodies.
7. Existing trees and shrubs will be retained wherever possible to act as windbreaks and to prevent erosion. The amount of vegetation to be cleared will be minimized.
8. Stockpiles will be covered. Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.
9. Weather conditions will be monitored for periods of high winds and dry weather where high dust levels are probable. During these periods, dust control and mitigation measures will be implemented.
10. Activities at the mine sites (Section 4.3 of the main document) and the processing complex (Section 4.2 of the main document) shall use specific mitigation measures for dust control, and these are outlined in the applicable sections.

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**Appendix A- 9 Noise Control**

**Operational Aspects**

A variety of noises are generated in relation to mining operations activities, which include noises related to drilling, blasting, crushing, dumping, generator and equipment use, as well as transportation. The noises produced during this phase are normally temporary in nature and localized.

**Environmental Concerns**

Noises generated during the operations phase can have potential negative effects on wildlife within the area.

**Environmental Protection Procedures**

Measures to control the potential effects of noise released from a variety of sources and activities will be implemented, including the following:

1. Adherence to all applicable permits and approvals.
2. Equipment shall have properly operating exhaust systems, which are regularly inspected to limit the potential for excessive noise on surrounding wildlife.
3. All materials handling will be carried out in such a way as to avoid unnecessary generation of noise.
4. Idling of vehicles (including heavy equipment) will be kept to a strict minimum, and

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only when necessary.

5. Heavy equipment will be equipped with properly operating noise abatement systems.
6. Efforts shall be made to ensure that an energy recovery system is fitted to the generator at the processing complex.
7. Noise will be monitored on a regular basis at the workers' camp to ensure that employees are not exposed to noise levels that exceed those prescribed by the Occupational Health and Safety Act.

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**Appendix A- 10 Tailings /Effluent Pipeline**

**Operational Aspects**

Tailings will be disposed of in the mined-out Timmins 2 pit initially. Other mined-out pits (Timmins 3N, Timmins 7 or Fleming 7N) will become available as mining proceeds and may be chosen if there is a need for more space. The design of the tailings/effluent pipeline will meet all safety and environmental standards. Tailings will be closely monitored, including testing for parameters in the Environmental Control Water and Sewage Regulations (N.L.R 65/03), and no discharge to the environment will occur.

The tailings pipeline will be approximately 1,600 m long with an approximately 500-mm diameter. It will be installed on a close to constant slope between the processing complex and Timmins 2. After the tailings have collected in the tailings box, they will flow by gravity to Timmins 2, which is 30 m below the elevation of the processing complex. A pump will be available in case it is needed.

**Environmental Concerns**

During tailings disposal, there is potential for accidental release of tailings through pipeline leaks and spills, having an effect on human and wildlife health, soil and water quality, as well as overall terrestrial and aquatic ecosystems.

**Environmental Protection Procedures**

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Tailings management shall be undertaken in accordance with the Mining Association of Canada (MAC) "A Guide to the Management of Tailings Facilities" (MAC 1998) and the Certificate of Approval obtained from the NLDEC and shall comply with the GoC Metal Mining Effluent Regulations and the Environmental Control Water and Sewage Regulations, (N.L.R 65/03). The MACs guidance document for "Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management" (MAC 2003) shall be consulted. The following preventative measures shall be followed:

1. Where possible, the tailings and process water reclaim pipelines will be insulated and heat traced to prevent freezing during winter months.
2. Where the tailings and process water reclaim pipelines cross watercourses, the pipeline shall be encased to reduce the potential for possible leaks entering and contaminating surface water.
3. In the case of frozen or broken pipelines, emergency dumping will be possible if necessary by the installation of air release/vacuum breaker valves or drain valves at dump ponds.
4. If a spill or leak is detected in the pipelines, the control of the pipeline at the processing complex will be shut down immediately to cut off the supply of tailings. The excess will be directed to a sedimentation pond.
5. Pressure sensors shall be used to detect leaks in the pipelines. If a leak is detected, a failure or leak indication alarm will alert the operator. In this case, an inspection team will be directed to the pipeline at specific locations.
6. The operator charged with the tailings shall do an external inspection by driving the length of the pipeline daily.

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**Appendix A- 11 Pumps and Generators**

**Operational Aspects**

Water pumps, hoses and generators will be frequently used during the operations phase of the Project. Particularly diesel generators will be used near the wash plant. Pumps will be used for process water, potable water, as well as vacuum pumps, and compressors. Most of these pumps and generators will be used near the wash plant, but they may be used at other places on-site.

**Environmental Concerns**

Major environmental concerns related to the operation of such equipment involve the potential for leaks of fuel and accidental spills entering the environment, contaminating soils and nearby water bodies.

**Environmental Protection Procedures**

Where pumps and generators and associated hoses are employed the following environmental practices will be undertaken:

1. Oils, gas, grease, diesel and other fuels will be safely stored at a minimum distance of 100 m from any water bodies when possible.
2. Drip pans will be placed underneath pumps and generators located near water bodies.

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3. Absorbent material will be readily available at sites where pumps and generators are in regular use.
4. Hoses and connections attached to pumps and generators will be routinely inspected for leaks and drips.
5. In addition to spill kits located at fuel storage tanks, other spill kits will be located at designated central storage locations. Personnel who deal with fueling, fuel transfer and pumps and generators will be trained in their use. Spill kit contents can be found in the “Fuel and Hazardous Materials: Storage, Handling and Emergency Response” (Appendix B- 1).
6. Any leaks found will be reported immediately to the Environment Coordinator.
7. Generator that are required for the development will be registered according to the NLDEC Pollution Prevention Division’s Guidance Document – Approval of Diesel Generators GD-PPD-061.

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**Appendix A- 12 Equipment/Vehicle Use and Maintenance**

**Operational Aspects**

During the operations phase, a variety of vehicles and heavy equipment will be used regularly. Regular maintenance of vehicles and heavy equipment is crucial for keeping them in good operating order and ensuring that they meet safety and environmental standards.

**Environmental Concerns**

Environmental concerns associated with the operation of heavy equipment include atmospheric emissions, noise, accidental spills and chronic leaks of fuels and lubricating oils, which may contaminate local water bodies and water supplies. Emissions from heavy equipment include CO, NOx, unburned hydrocarbons and particulates. Moreover, direct physical disturbances as a result of equipment movements can adversely affect terrestrial and aquatic environments. If vehicles and heavy equipment have not been regularly serviced or inspected, there is the possibility that mechanical failures can lead to spills of hazardous substances, such as fuel, to the surrounding water bodies and emissions to the air. On the other hand, the maintenance activities also have the possibility of releasing hazardous substances into the environment if appropriate measures are not in place.

**Environmental Protection Procedures**

1. Designated areas will be defined for equipment and machinery storage, washing

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and maintenance. Such areas must be located no less than 100 m from any watercourse.

2. Equipment will be clean, in good operating condition, free of leaks and with all appropriate emission filters to comply with Air Pollution Control Regulations, N.L.R 39/04 and other associated environmental emission guidelines and reduce noise disturbance.
3. Equipment washing will not occur within the aquatic environment.
4. Equipment maintenance will be performed only by qualified staff with appropriate training and certifications.
5. Equipment will be regularly inspected for leaks and mechanical failures that could lead to spills of fuel, lubricating oil or hazardous materials. Leaks will be repaired and reported immediately to the direct Supervisor. Documentation of maintenance and inspection activities will be recorded and stored on-site. Spill Contingency Measures are contained in Appendix B-1.
6. Fueling and routine maintenance operations will be conducted in accordance with appropriate standards and guidelines as described in Appendix B-1.
7. Equipment and vehicles shall operate only on the access roads, laydown areas and cleared areas designated for operations activities.
8. Vehicles are not to travel through water bodies unless the required approvals are received. Fording will only occur once all the proper permits have been acquired. Vehicles are to travel in single file as much as is possible. Existing paths are to be used as much as possible.
9. Heavy equipment will be confined to the Project site or approved roads.

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**Appendix A- 13 Vehicular Traffic**

**Operational Aspects**

Vehicular traffic during the operations phase includes vehicles such as ATVs, cars, trucks and heavy equipment required for operations activities.

**Environmental Concerns**

Direct physical disturbances from vehicular movements can adversely affect air quality, both terrestrial and aquatic environments, as well as historic resources.

**Environmental Protection Procedures**

1. ATVs shall not be allowed on the site except where necessary to perform work. When necessary, the use of ATVs shall be restricted to designated trails and roadways, within and between work, marshaling, maintenance and storage areas, thus minimizing ground disturbance.
2. ATV use shall comply with the Motorized Snow Vehicles and All-Terrain Vehicles Act, the NLDEC’s Environmental Guidelines for Stream Crossings by All-Terrain Vehicles (Water Resources Division, 1994), and the DFO Fish Habitat and All-Terrain Vehicle Guidelines (DFO 2010a<http://www.nfl.dfo-mpo.gc.ca/e0005494>).
3. Appropriate speed limits and road signage will be established and enforced to minimize environmental disturbance and accidents.

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4. Equipment and vehicles will yield the right-of-way to wildlife. Any wildlife encounters will be dealt with as described in Appendix B-2.
5. All Project vehicles will be properly inspected and maintained in good working order, including all exhaust systems, mufflers and any other pollution control devices to meet emission standards.
6. Travel in areas outside designated work areas will not be permitted.
7. Site roads will be graded regularly and monitored for signs of erosion, and appropriate action will be taken to repair roads where necessary.
8. Vehicles and equipment shall follow established routes when travelling to or from the site.
9. If issues arise related to noise attributed to Project or Operations related traffic, noise levels will be monitored during a typical day and, if necessary, changes will be made to reduce noise (e.g., rescheduling, modifying vehicles or adjusting speeds).
10. Trucks will operate only with registered allowable loads, unless oversize and overweight permits are obtained from the applicable regulatory agencies. All loads will be secured in accordance with the Load Security Regulations N.L.R 47/02 under the GNL Highway Traffic Act.

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**Appendix A- 14 Road Maintenance**

**Operational Aspects**

The access road to the workers’ camp will be 12 m wide, while all other site roads will be 21 m wide to accommodate large 180-tonne trucks. All roads will have a maximum gradient of 8% to accommodate for freezing and slippery conditions during winter. All site roads will require regular maintenance, including grading and ditching.

**Environmental Concerns**

Regular road maintenance is required to limit negative effects (e.g., erosion, dust) to the environment. As well, proper drainage on and around the roads is required to ensure sediment and runoff is not introduced to nearby water bodies, causing negative effects on fish and fish habitat.

**Environmental Protection Procedures**

1. Roads shall be adequately ditched so as to allow for good drainage. Ditches shall drain into sedimentation ponds or, when not possible, into vegetated or forested areas, and never directly into a watercourse. Refer to DFO Fact Sheet 3 – Ditching as well as to Gosse et al. (1998).
2. Wherever possible, ditches shall be kept at the same gradient as the road.
3. Culvert locations shall be marked, using a stake or post, to ensure they are visible during snow removal operations. This marker can also help locate the culverts in

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cases where they become covered with debris.

4. Site roads will be graded regularly to limit erosion and to ensure they are in good condition. A grader will be assigned to road maintenance 24 hours a day. Roads will be monitored for signs of erosion and will be repaired when necessary.
5. Dust control mechanisms will be required on the roads, which will include applying water or a calcium chloride solution (See Appendix A-7).
6. The haul roads will have proper drainage and a 2% crown plus a berm on the sides.
7. The haul roads (excluding the main access road) and the roads to the waste rock piles will not be open to the public during periods of active mining at the sites in question.

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**Appendix A- 15 Stream Crossings**

**Operational Aspects**

New culverts or bridges will be required during the operations phase of the Project. Some fording and in-stream work may be required occasionally, though this is not expected to occur frequently. If the development of stream crossings is required, they shall be constructed in compliance with the required Culvert Approval from the Newfoundland and Labrador Department of Environment and Conservation (NLDEC) and the Letter of Advice for Works and Undertakings Affecting Fish Habitat from Fisheries and Oceans Canada (DFO).

**Environmental Concerns**

With respect to stream crossings, environmental issues are mainly concerned with the direct influences on fish mortality, disruptions to waterfowl, as well as disturbances and loss of fish habitat through erosion and sedimentation.

**Environmental Protection Procedures**

In-stream work will be limited to the strict minimum. The following protection procedures will be implemented:

1. In-stream work will be of a minimum scope and duration, and will be performed during winter or, if not possible, at low water periods and in dry conditions to prevent siltation. The size of the work area will be identified prior to the work to

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avoid releasing excess sediments in waters and to limit turbidity.

2. The use of heavy equipment in streams or bodies of water is not permitted (see NLDEC - Environmental Guidelines for Watercourse Crossings; Environmental Guidelines for Bridges; Environmental Guidelines for Culverts; Environmental Guidelines for Fording and DFO - Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador (Gosse et al. 1998).
3. Unless otherwise indicated, all work shall take place in dry conditions, either by the use of cofferdams or by diverting the stream (DFO 2010b).
4. Measures will be implemented to ensure that no fuel or oil enters any watercourse or stream.
5. Stability of soils on banks and slopes will be ensured using geomembrane and riprap structures on slopes and the bed of the watercourse.
6. Monitoring may be required to ensure compliance with the Environmental Control Water and Sewer Regulations.
7. Work will be avoided when possible during critical periods for fish (e.g., spawning, incubation, fry rearing), as well as critical areas (e.g., spawning). Between June 1st and September 15th, stream crossing construction activities taking place within fish habitat will be undertaken under direct supervision of the HSE Manager, or designated environmental officers.
8. Where culverts are required, a Culvert Approval will be acquired from the NLDEC, and constructed in accordance with its Environmental Guidelines for Culverts (Water Resources Division 1992). In the case of confirmed or potential fish habitat, bottomless arch culverts will be used so as to not disturb fish habitat. Prior to construction, approval from the Area Habitat Biologist (DFO) is required. The

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following protection measures will also be followed:

9. Installation of culverts will be in such a way that fish passage is maintained at all times, and the passage is unobstructed.
10. The culverts used shall be sized to handle the 1-in-25 year return period flood, with a minimum diameter of 1000 mm. The depth of the water shall be no more than 85% of the culverts' vertical clearance.
11. In multiple (gang) culvert installations, one culvert shall be installed at an elevation lower than the others.
12. Measures will be implemented to not alter the natural flow regime of the watercourse.
13. Culverts must not disrupt flow of water or cause ponding at the upstream side of the installation.
14. Before installation of a culvert, site-specific information will be evaluated, including localized stream gradient, fish habitat type and species present.
15. When choosing the correct gradient for installing a culvert, care shall be taken to ensure that the grade line coincides with the average streambed gradient. Culvert gradient higher or lower than the average stream grade will result in an obstruction for fish passage. Deviations from the stream gradient may sometimes act as a way to decrease flow, though calculations for this argument must be justified. In the case that the desired flow velocity cannot be achieved via a culvert, a bridge may be required.
16. Riprap, filter stone or concrete headwalls will be placed near inlet and outlet areas to prevent erosion.

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17. Culverts of sufficient length will be used to extend beyond the toe of the fill material

18. Backfill material which is of a texture that will support the culvert and limit seepage and subsequent washing out shall be used. Flow velocity of the stream must be considered when choosing particle size for backfill. Table 1 provides the transport velocity for the typical sizes of streambed materials.

**Table A-15 Transport velocity for various sizes of streambed materials**

Material	Particle Size (MM)	Velocity (m/s)
Silt	0.005-0.05	0.30
Sand	0.25-2.5	0.39-0.65
Gravel	5.0-15	0.80-0.65
Pebble	25-75	1.40-2.40
Cobble	100-200	2.70-3.90

19. Culverts will be aligned such that the original direction of stream flow is not significantly altered, and the gradient at the culvert follows the stream channel gradient to the extent possible. Infilling or reduction of the natural cross-sectional area of the watercourse is not permitted.

20. Fill and construction debris shall be removed from the culvert area to a location above the peak flow line to prevent its entry into the stream.

21. Fill material shall not be removed from streambeds or banks except where removal of material is necessary to ensure a foundation for installing a culvert.

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22. As required, cofferdams of non-erodible material shall be installed above and below work areas to separate them from the watercourse when excavating for culverts and footings. Where pumping is used to bypass flow, pumps must have sufficient capacity to prevent washout of the cofferdams.
23. Cofferdams shall be removed upon completion of construction and the stream bed returned as closely as possible to its original condition.
24. Water pumped from work areas or other runoff must have silt and turbidity removed by settling ponds, filtration or other suitable means before discharging to a water body.
25. Culverts shall be marked to indicate their position under the snow.
26. Construction standards for crossing streams frequented by Harlequin ducks will require bridges instead of culverts. All watercourses and water bodies will be examined on a site-specific basis in order to evaluate the habitat type and species present at each stream crossing including upstream and downstream.
27. Any activities involving replacement of existing culverts will also be reviewed by DFO, and approval shall be acquired prior to the work.
28. Before temporary fording any watercourse (one time only), the National Operating Statement for Temporary Fording Sites will be consulted (<http://www.nfl.dfo-mpo.gc.ca/e0005517>). If the fording event is not a one-time event, a notice will be sent for approval to the DFO Area Habitat Biologist for a Letter of Advice.
29. When fording any watercourse, the Environmental Guidelines for Fording from the NLDEC Water Resources Division and the guidelines outlined in DFO's Factsheet No. 4 (DFO 1994) and DFO's Factsheet called In stream work in the Dry (DFO 2010b) shall be applied and:

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- a. Critical areas, such as spawning habitat, shall be avoided.
  - b. Where feasible, crossings shall be restricted to a single location and crossings shall be perpendicular to the watercourse where the streambed is not erodible.
  - c. All equipment shall be clean and mechanically sound to avoid the introduction of oil, gasoline and hydraulic fluids to water bodies.
30. No servicing or washing of heavy equipment shall occur adjacent to watercourses; temporary fueling, servicing or washing of equipment in areas other than the main fuel storage site shall not be allowed within 100 m of a watercourse except within a refueling site which has been already approved (where conditions allow for containment of accidentally spilled fuels).
31. All waste oil, filters, containers or other such debris shall be removed from the work area and disposed of in an approved waste disposal site.
32. The entire fording area shall be stabilized using vegetation mats, corduroy roads or coarse material (125 mm diameter or greater) when such material is available from a reasonably close location within the right-of-way, and the ford area is not natural bedrock or is easily disturbed by fording. When the substrate of the ford area is not subject to easy disturbance by fording, or coarse material is not readily available within the right-of-way, fording under existing substrate conditions may occur under the guidance of the Environment Coordinator.
33. Activities shall not decrease the depth of the watercourses to less than 20 cm; where the existing depth is less than 20 cm, that depth shall be maintained.
34. Fording activities shall be halted during high flow periods.

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35. Bank sections which contain loose or erodible materials shall be stabilized or avoided if possible. If banks must be sloped for stabilization, no material shall be deposited within the watercourse; sloping shall be accomplished by back-blading and the material removed shall be deposited above the high water mark of the watercourse.
36. Where bridge construction is required, environmental protection procedures outlined in the above section which are applicable will be adhered to. As well, the following protection procedures will be applied:
  37. To safely convey peak flows, bridges will be designed for a 25-year return period stream flow.
  38. Bridge abutments and their footings will be set above the high water mark of the watercourse to prevent constriction during high flow conditions.
  39. The upstream and downstream sides of abutments will be protected with riprap, concrete or heavy timber to prevent erosion and scouring.
  40. Roadside embankments near the watercourse will be adequately protected from erosion by sodding, seeding or placing of riprap.
  41. Adequate erosion protection will be provided where roadside ditches discharge into the watercourse near the bridge.
  42. Abutments and piers will be constructed in the dry and during times of low flow.
  43. During construction of concrete components, formwork will be constructed to prevent any fresh concrete from entering bodies of water. Dumping of concrete or washing of tools and equipment in any body of water will be prohibited.
  44. Wood preservatives, such as pentachlorophenol (penta), chromate copper

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arsenate (CCA) or creosote or treated wood products, will not be used for bridgework.

45. Periodic maintenance, such as painting, resurfacing, clearing of debris or minor repairs, will be carried out without causing any physical disruption of the watercourse. Care will be taken to prevent spillage of pollutants into the water. In the case of a spillage, refer to Appendix B-1.

46. All waste materials will be disposed of at an approved landfill.

47. All areas affected will be returned to a state that resembles local natural conditions.

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**Appendix A- 16 Quarrying and Removal of Aggregate**

**Operational Aspects**

During the operations phase, quarrying may be required for fill for development/maintenance of infrastructure, and the maintenance and upgrading of roads. There are plans to quarry at an existing quarry located in Quebec for the DSO project. During the preparation/construction phase, three quarries were developed for site/construction activities. These may or may not be in use during the Operations phase.

**Environmental Concerns**

The environmental concerns in relation to development of quarries and the associated removal of aggregate include the potential for sediment to enter freshwater systems, creating issues for water quality. As well, the loss of terrestrial habitat and land use is also an environmental concern related to development of quarries.

**Environmental Protection Procedures**

Quarrying in relation to the DSO Project Project will entail aggregate removal from an already existing quarry in Quebec. This minimizes the amount of disturbance to the terrestrial environment. No anticipated quarries will be developed in Newfoundland and Labrador. Quarry Development and Aggregate. Quarrying activities will comply with the following protection procedures:

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1. Quarry activity shall adhere to all relevant federal, provincial and municipal laws and regulations.
2. Quarry areas shall be developed in a controlled manner so as to minimize potential environmental effects.
3. The development area, stockpile area and limits of clearing shall be staked and/or flagged to prevent over-extension of the development, thereby minimizing the extent of the operation.
4. The area to be excavated shall be cleared of all vegetation prior to any grubbing, excavation or removal of any material.
5. All stumps, organic matter and topsoil shall be stripped from the area to be excavated and stockpiled at least 5 m from uncleared areas; stockpiled stripping shall be kept at least 10 m from the area of excavation; separate overburden piles shall be developed for stripped material; topsoil and the underlying overburden shall not be mixed.
6. Upon completion of the excavation of a quarry, no cliff faces in rock shall be left at a height of greater than 6 m. Where benching is required, bench height will not exceed 5 m. Overburden will be graded to less than 30° slope. Available material, left over from quarrying and stockpiled overburden shall be used to minimize slopes and face heights. Following grading, the topsoil and any organic materials shall be spread over the disturbed area to promote natural re-vegetation by adjacent seed sources.
7. Any drainage into the quarry area will be diverted away from the quarry site.
8. A settling pond shall be established for all quarry runoff and, if required, cleaned on a regular basis so that the retention capacity is maintained at all times.

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9. Dust from aggregate storage and handling shall be controlled with water as required.
10. Aggregates containing sand-sized and smaller fractions shall be stored in such a way as to prevent their erosion.
11. The contractor shall be responsible for obtaining all permits and approvals required for carrying out any quarry operations. Copies of any such permits or approvals shall be provided to TSMC.
12. Aggregates, expected to be provided from existing off-site quarries, will be stockpiled in approved locations with provision for control of silt-laden run-off water and dust generation.
13. Fill and aggregates will be stored and handled in strict compliance with the protection procedures for dust control (Appendix A-7).

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**Appendix A- 17 Waste Rock Piles**

**Operational Aspects**

Where possible, waste rock from the open pits shall be used for construction or other purposes on-site (e.g., for roads or general construction work). Excess waste rock from the pits that cannot be reused elsewhere will be disposed of in waste rock piles.

**Environmental Concerns**

Surface runoff may contain suspended matter resulting from precipitation on waste rock piles, and may have an effect on the quality of nearby water bodies. Surface runoff may also cause erosion issues nearby.

**Environmental Protection Procedures**

1. Waste rock piles will be positioned further than 60 m from the high-water line of a watercourse or if not possible, no less than 30 m, and the reasoning must be justified and approved prior to placing waste rock piles less than 60 m from a watercourse.
2. The piles will have perimeter ditches to direct runoff to catchment basins, where suspended solids will settle.
3. The waste rock benches will have a slope gradient away from the dumping face to prevent rainwater from running over the edge of the pile, so as to limit erosion of

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the dump face.

4. Bulldozers will be used for bench preparation and waste rock pile maintenance.
5. Waste rock piles shall be located near the pits to limit haul distances.
6. Waste rock shall be piled separately from other waste, such as overburden.
7. Waste rock piles shall be progressively rehabilitated as they become inactive.
8. The design parameters for the waste rock piles are as follows:
  - Face angle of 45°;
  - Bench height of 18 m;
  - Berm width of 15 m; and
  - Overall slope of 29°.

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**Appendix A-18 Laydown/Storage Areas**

**Operational Aspects**

Laydown/storage areas are generally required during mining operations to store materials and equipment. Two open-air laydown areas will be provided: one near the processing plant and the other near the maintenance garage. Their area will be approximately two hectares. Generally equipment and materials that can withstand outside temperatures and weather, including rain and snow, are kept in outdoor laydown areas, while other more sensitive materials and equipment are stored in the warehouse.

**Environmental Concerns**

Environmental concerns related to lay-down and storage areas include the danger of spills and leaks of hydrocarbons and other hazardous materials during equipment storage, assembly or repair, as well as physical disturbance of terrestrial environment during equipment/vehicle movements.

**Environmental Protection Procedures**

1. All laydown and storage areas shall be located at least 30 m from the high water mark of any water body, and shall be located in previously disturbed sites where possible.
2. Transportation of equipment and vehicles to and from the laydown/storage areas

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shall follow established routes.

3. The site for equipment marshaling will be located to minimize potential traffic hazards and enable incoming and outgoing vehicles to merge safely.
4. Storage and laydown areas will be located on level terrain, free of ponding or run-off. In the case of run-off, grading or ditches shall be dug around the perimeter of the laydown area to limit contamination of surface run-off water. Where necessary, sediment settling basins will be created.
5. During assembly, disassembly, servicing or maintenance of equipment in marshaling yards, drip pans shall be used to collect seepage or leakage of fuels or lubricants at connection points or other points of potential leakage. See “Fuel and Hazardous Materials: Storage, Handling and Emergency Response” (Appendix B-1).
6. Areas to be used for laydown and storage will be limited. The development of new laydown or storage areas will follow procedures for vegetation removal (Appendix A-18) as well as those for grubbing and related debris disposal (Appendix A-20) and Erosion Prevention (Appendix A-22).
7. Laydown and storage areas which are not in use during the operations phase will be rehabilitated as necessary.

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**Appendix A- 19 Clearing and Disturbance to Vegetation**

**Operational Aspects**

Clearing of vegetation is common in the pre-production phase of mining developments and is often one of the first steps during mining activities. Vegetation removal may be required during the operations phase to improve work areas and laydown areas and to upgrade roads, for example. Where necessary, this activity will include clearing and felling of trees using hand-held equipment, as well as mechanical removal of the organic layer and vegetation. Measures to minimize the amount of vegetation removal or disturbance and to decrease the potential effect of required clearing of vegetation will be implemented.

**Environmental Concerns**

Clearing and disturbance to vegetation can have several effects on the existing environment. Of the most importance is its potential effect on water quality and habitat for certain species. The potential exists for suspended material to enter the water by surface runoff, thus degrading the quality of nearby waterways. Disturbance and destruction of habitat for caribou, harvested mammals, avifauna, as well as other species located within the affected area may also be an issue.

**Protection Procedures**

The clearing and disturbance of vegetation will be limited, since much of the proposed

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infrastructure will be located on previously disturbed sites, with the exception of service infrastructure. Where clearing of vegetation is required, a timber cutting permit will be obtained through the NLDNR. A trained forestry technician will perform tree cutting, and authorizations will be obtained prior to any clearing activities. Cutting will comply with the provisions of the permit, as well as the following protection measures:

1. Before the clearing of any vegetation, boundaries of the work areas (right-of-way, storage area, etc.), and the trimming to be done will be clearly identified. Protected areas and wetlands will be avoided.
2. Clearing of vegetation will comply with the Forestry Guidelines for the Protection of Fish Habitat in Newfoundland and Labrador (Scruton et al. 1997), and the Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador (Gosse et al. 1998).
3. Efforts will be made to preserve no-cut buffer zones of 100 m from the high watermark of all water bodies to protect riparian and aquatic habitat. If this cannot be obtained, a minimum 20 m buffer zone will be undisturbed with slopes < 30%. For slopes > 30%, use the following formula (Gosse et al. 1998):
  - a. Buffer width (m) = 20 m + 1.5 x Slope (%)
4. In the case that a tree on the bank of a watercourse must be cut down, the root structure will be preserved in order to maintain bank stability and decrease the possibility of erosion.
5. Measures will be implemented to avoid mature tree stands when possible.
6. During vegetation removal, clearing will be phased as to conserve the vegetative cover as long as possible.

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7. Trees will be cut close to the ground (< 15 cm in height) to prevent uprooting of stumps, and further destruction of the soil. The Environmental Protection Guidelines for Ecologically Based Forest Resource Management (NLDFRA 1998) will be adhered to.
8. Log portions greater than 9 cm in diameter will be limbed and stacked for salvage and those less than 9 cm will be piled or lopped and scattered if conditions are conducive to reduction of ground disturbance.
9. Hand-held equipment, such as chain saws, will be used for clearing. Bulldozers will be avoided when possible.
10. Trees of economic value (i.e., firewood) will be made available to local First Nations.
11. All trees will be felled inward toward a work area and away from watercourses, to protect standing trees and aquatic habitat.
12. Trees will not be uprooted mechanically close to the boundaries of the work areas. A 3-m transition zone at the edge of the boundaries will be maintained in which trees are cut, but not uprooted, and the shrub layer is preserved. The removal of vegetation on steep slopes along roads or close to watercourses will be avoided. A buffer zone of undisturbed vegetation will remain along any road running adjacent to a water body. The minimum buffer zone can be calculated using the following formula (Gosse et al. 1998):
  - Buffer width (m) = 20 m + 1.5 x slope (%)
13. Disposal of cleared merchantable timber, slashing's and cuttings by burning will be in compliance with the Forest Fire Regulations CNLR 11/96 and the Permit to Burn obtained from the NLDNR within the forest fire season. Prior to burning, the wood

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to be burned will be gathered in piles or rows not exceeding 2.5 m in height and separated from the forest by a minimum distance of 12 m.

14. Burning will not take place further than 60 m from a watercourse, or  $20\text{ m} + 1.5\text{ m} \times \text{slope} (\%)$  where the slope is  $> 30\%$  (Scruton et al. 1997). At no time will a fire be left unattended.
15. Slash and any other construction material or debris will not be permitted to enter any watercourse and will be piled above spring flood levels.
16. During the nesting season, if the nest of any migratory bird or raptor is discovered, no clearing will be permitted within 800 m of it. Outside of the nesting season, clearing will not be permitted within 200 m of a known nest.
17. After work has been completed, all debris will be removed.
18. In the case of grubbing, the environmental protection procedures in Appendix A-20 will be followed.

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**Appendix A- 20 Grubbing and Disposal of Related Debris**

**Operational Aspects**

Grubbing may be required during the pre-production phase to prepare for mining, as well as to prepare and maintain work areas and laydown areas. It will include the removal of topsoil and overburden using heavy equipment, and the subsequent storage and disposal of removed material.

**Environmental Concerns**

The principal concern associated with grubbing and disposal of related debris are the potential for erosion and its associated effects on the water quality of nearby watercourses. According to the layout of the proposed infrastructure (NML and PFWA December 2009), no such activity is planned within 100 m of a watercourse. The potential for disturbance of terrestrial animal habitat and disturbance of historic resources due to ground disturbance are also environmental concerns related to grubbing.

**Environmental Protection Procedures**

All grubbing and disposal of related debris near watercourses shall adhere to requirements including permits from the NLDEC and the Letter of Advice for Works or Undertakings Affecting Fish Habitat from the DFO pursuant to the Fisheries Act. Other specific measures to be undertaken to minimize potential effects on aquatic and

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terrestrial habitat, as well as resources are as follows:

1. In order to limit erosion, grubbing of the organic vegetation mat and/or the upper soil horizons shall be minimized, especially on slopes and along access roads. Limits of stripping and/or grubbing must be shown on all drawings issued for construction.
2. The organic vegetation mat and upper soil horizon material which has been grubbed shall be spread in a manner which covers exposed areas. Any surplus material shall be stored or stockpiled for site rehabilitation and re-vegetation purposes elsewhere in the project area. Topsoil and peat shall be stockpiled separately from the overburden separated by a buffer zone and at a minimum distance of 30 m from any water bodies, watercourses or ecologically sensitive areas (see Goose et al. 1998). The location of the stockpiles shall be located in clearly designated, pre-defined areas, and shall be covered to prevent movement of material by wind or rain.
3. Topsoil shall not be re-used in places saturated with water. Where possible, it will be re- used within 12 months.
4. All plant material removed from cleared areas shall be stockpiled for mulching
5. All measures shall be taken to ensure the natural drainage of the grubbed site is maintained, without disrupting the natural flow of water.
6. Measures shall be implemented to minimize and control runoff of sediment-laden water during grubbing and the re-spreading and stockpiling of grubbed materials. Where grubbed materials are re-spread or stockpiled, as many stumps and roots as possible shall be left on the ground surface to maintain soil cohesion, to dissipate the energy of runoff and to promote natural re-vegetation. Erosion control

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measures shall be implemented in areas prone to soil loss; these measures could include brush cover, stone riprap, wire mesh, settling ponds and drainage channels. The length of time that grubbed areas are left exposed to the natural elements shall be minimized to prevent unnecessary erosion.

7. Grubbing activities shall be avoided in areas of high slopes near watercourses. A buffer zone of 30 m shall be maintained between grubbed areas and watercourses or wetlands. Grubbing limits adjacent to watercourses will be flagged in the field prior to undertaking grubbing/stripping activities (see Gosse et al. 1998).
8. Organic matter and debris from grubbing shall not be disposed of into any watercourse.
9. Grubbing activities shall be avoided during snow clearing.
10. Exposed areas shall be limited at any given time; as well, riprap, filter fabrics, gravel, woodchips or other anti-erosion devices shall be used to stabilize exposed soil, as to minimize soil disturbance. Exposed areas shall be vegetated as soon as possible.
11. Topsoil stockpiles shall not be subject to compaction.
12. Stockpiles shall be covered to prevent movement of material by wind or rain; however materials such as plastic may cause them to become anaerobic, and therefore shall be avoided.

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**Appendix A- 21 Buffer Zones**

Buffer zones of natural vegetation or undisturbed areas adjacent to construction areas help mitigate adverse environmental effects such as erosion and runoff of sediment-laden water to streams, water bodies and other ecologically sensitive areas. Buffer zones may also provide wildlife habitat or travel corridors near works areas and cover for fish habitat.

**Environmental Protection Procedures**

Operations activities will be conducted in a manner such that there will be no disposal or emissions within the pre-defined buffer areas. According to the layout of the proposed infrastructure (NML and PFWA December 2009), no development is planned within 100 m of a water body, permanent or intermittent.

If the minimum buffer zones cannot be achieved, other mitigation measures will be considered on a site-by-site basis. Monitoring of buffer zones may be required to ensure compliance with the Environmental Control Water and Sewage Regulations (65/03).

The following protection measures will be implemented in regards to buffer zone management:

1. A buffer zone of at least a 20 m buffer of undisturbed vegetation will be maintained along watercourses, wetlands or other ecologically sensitive areas. In areas with slopes exceeding greater than 30%, fish habitat protection guidelines may be used to determine the buffer width, which can be calculated using the following equation

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from Gosse et al. (1998):

- Buffer Width (m) = 20 m + 1.5 x slope (%).
2. Buffer zones along roads should be approximately 60 m, or 20 m + 1.5 x slope (%) where the slope is > 30% (Scruton et al. 1997).
  3. A minimum buffer zone of 25 m will be maintained around any archaeological site.
  4. Silt runoff control fences will be constructed upstream of the buffer zone when required to control runoff from areas of exposed soils towards the buffer zone.
  5. Silt fences and buffer strips will be inspected on a regular basis. Required repairs and replacement of damaged silt fences will be addressed immediately. Any accumulations of silt observed will be removed and disposed of in an area where it will not re-enter any water body or watercourse.
  6. Fueling or servicing of mobile equipment will not be allowed within 100 m of watercourses, water bodies, drainage systems or ecologically sensitive areas (Gosse et al. 1998).
  7. For equipment of limited mobility where the 100 m buffer zone cannot be practically achieved, adequate drip and spill containment will be provided during the refueling operation and will be subject to the approval.

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**Appendix A- 22 Erosion Prevention**

Project activities in the vicinity of water bodies have the potential to cause erosion of stream banks, which causes siltation in water bodies and, subsequently, decreases suitable habitat for aquatic and terrestrial animals.

Environmental Protection Procedures

**Environmental Protection Procedures**

The possibility of negative effects due to runoff and erosion is a common concern with preparation/construction activities and is addressed by adequate planning and operation. The following protection procedures will be applied during the course of the operations phase of the Project to help mitigate erosion and issues arising from sedimentation and siltation.

1. Zones which are potentially sensitive to erosion will be defined prior to work, using maps of surficial deposits and slope classes. These areas will be avoided where possible.
2. Stripping, clearing, excavating, filling and grading will be limited to the strict minimum to prevent erosion.
3. Plans to control sediment shall be reviewed and approved before the commencement of the work, and the work will comply with all permits, approvals and/or authorizations.
4. A buffer zone of 20 m will be preserved along watercourses or wetlands, and no

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ditches will be dug in the buffer areas (see Gosse et al. 1998). Beyond this buffer, water must be diverted towards a vegetation zone located outside the right-of-way. If necessary, a sedimentation basin will be created outside the riparian buffer to catch runoff and sediment.

5. Erosion control techniques and devices will be used to stabilize easily eroded areas.
6. Anti-erosion barriers will be built along watercourses by driving wooden stakes into the ground every one to two meters. A trench will be built at the base of the barrier, approximately 10 cm deep by 10 cm wide. Filter cloth will be attached to the stakes, and 20 cm of the filter cloth will be placed at a right angle in the trench. The trench will be filled over the filter cloth, and the ground compacted. Integrity of the barrier will be checked regularly and at least every six months.
7. Along steep slopes bordering the road right-of-way, sediment barriers will be used at the foot of the slopes where possible. Other protective measures may also be used in place of barriers, such as straw, woodchips or drainage blankets.
8. Where possible, slopes produced from operations activities where erosion is likely to cause an influx of sediments into a watercourse shall be stabilized using native plants. Stream bank sections that contain loose or erodible materials will also be stabilized. Sloping shall be accomplished by back-blading and the material removed will be deposited above the high water mark of any watercourse.
9. Vehicle and equipment movement will be restricted on the Project site to approved roadways and designated construction areas. Appropriate drainage and erosion control techniques will be implemented. All work will be performed in such a manner that deleterious substances including, but not limited to, materials such as

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sediment, fuel and oil do not enter water bodies adjacent to the work site.

10. For any work with the potential to significantly affect fish habitat, TSMC will complete a Request for Project Review and submit it to DFO.
11. Environmental inspections of work areas will be conducted on a regular basis to ensure erosion is not taking place. Further mitigation measures will be implemented if an inspection reveals that siltation is occurring in a water body. These include such measures as temporary drainage ditches, siltation settling ponds, ditch blocks/check dams or sediment dam traps to intercept runoff or grading surfaces to remove erosion channels. The necessary and appropriate measures will be determined on-site.
12. Siltation control structures will be monitored for excessive accumulation of sediment.
13. Accumulated sediment will be removed from control structures to maintain their effectiveness.
14. Excess water will be removed from siltation control systems prior to excavation of sediment.
15. Inspections and maintenance of erosion and sediment controls will be undertaken at least once a week and following significant rain events.
16. In the case of grubbing and disposal of related debris, refer to environmental protection procedures in Appendix A-20

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**Appendix A-23 Trenching**

**Operational Aspects**

Trenches may be required during the operations phase for the maintenance of sewer and water infrastructure.

**Environmental Concerns**

The digging of trenches has the potential to interfere with the water quality of nearby watercourses, with the potential of sediment-laden water to enter freshwater, leading to deteriorating conditions for fish and fish habitat. There is also the possibility of an interaction with historic resources and terrestrial ecosystems.

**Environmental Protection Procedures**

1. No trenches shall be dug in the buffer zone (20 m) of watercourses. Measures shall be taken to ensure that water is diverted towards vegetation zones located outside the right-of- way.
2. Trenches on sloping land will be dug to ensure that they are tiered or terraced. Those adjacent to roads and access routes will be built to ensure maximum stability.
3. Where possible, excavated material will be stockpiled for possible backfilling. Topsoil, subsoil and rock debris will be stockpiled in separate piles, not exceeding

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a height of 1-2 m, and not closer than 30 m from a nearby watercourse.

4. During dewatering of excavated trenches, measures will be implemented to ensure limited release of sediment-laden water. This includes filtration, erosion control devices, settling ponds, straw bales, geotextiles, etc.
5. In the case of discovery of historic resources, refer to the Cultural Heritage Control Plan in Appendix B-3.

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**Appendix A- 24 Excavations, Embankments and Grading**

**Operational Aspects**

Excavation, embankment and grading of common rock and gravel may be required in the operations phase of the DSO Projects for infrastructure maintenance, as well as the upgrading of access roads.

**Environmental Concerns**

Primary environmental concerns in relation to excavations, embankments and grading include the potential for disturbance to fish habitat, water quality from the possibility of soil erosion, bringing high sediment loads into nearby watercourses. Exposing sulphide-containing rock to the atmosphere can result in acid generation, with subsequent metal dissolution and depressed pH in receiving waters. As well, these activities have the potential to disturb terrestrial animal habitat and historic resources.

**Environmental Protection Procedures**

Excavations, embankments and grading will be limited in order to respect the natural topography of the site and minimize erosion. As well, the following protection procedures will be implemented:

1. Work areas will be clearly defined and the surface area and volume to be excavated will be determined before proceeding with excavations. Measures will be implemented to ensure that these plans are closely followed.

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2. Excavations, embankment and grading will only take place after the processes of grubbing and stripping are completed (See Appendix A-20).
3. Excavation and re-profiling will be done from the top of the slope and supervised to detect the possibility of landslides. In the case of landslides, work techniques will be adjusted accordingly.
4. Native plants will be used to stabilize slopes produced by excavation.
5. Excavated material will be stockpiled where necessary for backfill, and placed no less than 30 m from any watercourse.
6. Where possible, excavated material will not be stored on steep slopes (> 15% gradient). Material will be compacted, placed in several thin layers rather than in a single layer. The height and depth of backfill shall be limited to 3 m in zones lacking transverse slopes.
7. Measures shall be taken to control the quality of runoff or water pumped out of excavations, such as filtering, decanting, treating or other methods. This water will not be released directly into any water body.
8. Exposed areas shall be limited at any given time; as well, riprap, filter fabrics, gravel, woodchips or other anti-erosion devices will be used to stabilize exposed soil, as to minimize soil disturbance. Exposed areas shall be re-vegetated as soon as possible.
9. Excavations, embankments and grading activities in the vicinity of water bodies will not coincide with sensitive periods for fish (e.g., spawning).
10. The use of silt curtains, cofferdams and/or sediment fences will be implemented prior to grubbing or excavation to direct natural drainage around work areas.

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11. In the case of discovery of historic resources, refer to the Historic Resources Contingency Plan in Appendix B-3.

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**Appendix A-25 Surveying**

**Operational Aspects**

Surveying activities can occur on undisturbed land, and therefore may require the removal of vegetation, traversing and the establishment of targets, permanent benchmarks and transponder stations.

**Environmental Concerns**

Surveying activities involve cutting and disturbance to vegetation, and have the potential to disturb wildlife and the possibility of interference with historic resources.

**Environmental Protection Procedures**

During surveying activities, cut lines will be required; however they will be limited to the strict minimum. The environmental protection measures for Clearing and Disturbance to Vegetation (Appendix A-19) will be followed, and the following additional protection procedures will be implemented:

1. Working areas will be pre-defined, with a cutting plan to mark the limits of the right-of-way to be cleared. Buffer areas will be clearly established, and dangerous trees will be identified and avoided.
2. Cut lines will be limited to what is necessary for line of sight and unobstructed passage, with a maximum width of 1 m.

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3. Hand tools will be used for cutting trees.
4. All trees not exactly on transit lines shall be left standing, and trees partly on line shall be notched (notch not to exceed 1/3 tree's diameter) instead of removed in order to allow sighting.
5. Discretion shall be used when large trees are encountered. For example, trees 30 cm diameter at breast height (dbh) or larger should, whenever possible, not be cut. On grid lines, trees of 30 cm diameter or larger shall be left intact and shall be traversed to continue the line.
6. Sturdy material that is weather-resistant and tear-resistant and visible at a distance shall be used for flagging. Biodegradable ribbon is preferential; however, when non- biodegradable ribbon is used, such as pegs and tape, they will be removed upon completion.
7. No attempt to harass or disturb wildlife will be made by any person. Work will cease in the case of caribou sightings.

When survey activities require the establishment of targets, permanent benchmarks and transponder locations, the following environmental protection procedures will be implemented:

1. ATVs will not be allowed off the right-of-way, except as approved by authorized personnel.
2. ATV use shall comply with the Motorized Snow Vehicles and All-Terrain Vehicles Act, the NLDEC's Environmental Guidelines for Stream Crossings by All-Terrain Vehicles (Water Resources Division, 1994), and the DFO Fish Habitat and All-Terrain Vehicle Guidelines (DFO 2010a<http://www.nfl.dfo-mpo.gc.ca/e0005494>).

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3. ATVs and other vehicles must yield the right-of-way to wildlife encountered.
4. A driven T-bar, well embedded to readily identify each benchmark location, will be used.
5. Standard iron bars and sledge hammers will be used to establish benchmarks.
6. Temporary photo targets established for the purposes of aerial survey work must be removed as soon as work is complete.

During surveying activities, in the case of discovery of historic resources, refer to the Cultural Heritage Control Plan in Appendix B-3.

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**Appendix A-26-Cultural Heritage**

**Operational Aspects**

During the construction phase and to a lesser extent the operations phase, it is imperative that we identify, document, preserve and protect any cultural heritage resources that may occur in close proximity to our operations. These resources include but are not limited to:

- Evidence of former occupation (circle of stones, raised earth, stone structures, remains of campfires as evidenced by the presence of charcoal or bone, wooden poles, fabric)
- Tools such as arrowheads, knives, scrapers, hooks spears, etc.
- Burial sites (identifiable with piles of stones, small rectangular mounds, or in more recent years small fences or structures)
- Wooden structures (canoe racks, skin or meat drying racks, sleds, etc.)
- Places of worship or commemoration (identifiable with statues or crosses)
- Tools (pots, utensils, knives, traps, guns or ammunition, metal pans)
- Evidence of contemporary dwellings (post-1930"s) and associated artefacts.
- Paleontological resources (fossil remains)

**Sociocultural Concerns**

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Beyond the requirements of the Historic Resources Act and the Cultural Property Act, TSMC’s operations must be performed in a mutually beneficial manner with the communities within which we work. Certain sites (ex. Irony Mountain) are of particular value to Aboriginal groups and as such we apply appropriate buffers to our operations.

**Cultural Heritage Protection Procedures**

All discoveries must take place in accordance with the Historical Resources Act (NL) and the Cultural Property Act (Quebec), and in doing so several steps must be taken as archeological artifacts and other cultural remains must not be moved or removed without the permission of a professional archeologist with a ministerial mandate.

Contractors will provide training to their supervisors and heavy equipment operators on types of culturally important sites that may be encountered and procedures to ensure that these sites are not further disturbed until a Provincial Archeologist and the Aboriginal groups have been notified. Contractors will review and adhere to TSMC’s Cultural Property Protection Plan.

In the event of discovery of archeological property:

1. Work boundaries must be moved to accommodate protection of cultural objects. A 50m buffer zone will be recreated around the discovery site until further notice by regulatory authorities. If discovered, the TSMC environmental manager must be contacted (via the TSMC environmental representative on site), who will then contact the Provincial Archeologist.

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2. At the time of discovery, the following information is required: type of activity occurring and name of discoverer, nature of material discovered and precise location of the find.
3. Under no circumstances will work be carried out in the area of discovery nor will the resources in question be removed, moved, or otherwise tampered with. In the event of discovery of suspected human remains or burial sites:
4. Work in the immediate area will be suspended; site managers and environmental representative will be notified immediately.
5. If remains are found during operation of heavy equipment, the equipment must not be moved by the contractor as physical evidence may be destroyed.
6. The site (including equipment if applicable) will be secured by contractor with flagging tape or other appropriate means. The suspected remains are to be covered with a tarp.
7. If blasting is necessary in the vicinity, precautions must be taken to ensure shock waves do not disturb the site. If necessary, protective cover shall be given to the site under the supervision of an approved archeologist.

In all circumstances, a report must be completed by a member of the environmental team identifying nature of discovery, parties notified, and procedures followed.

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**Appendix 27-Incidents and Complaints**

**Operational Aspects**

During both the construction and operation phases of the project, Incidents and complaints may arise about any aspect of day to day operations. Incidents and complaints relative to TSMC’s environmental policies and directives may concern spills, septic, animals, potable water, etc. The measures laid out in this document will detail the appropriate procedures to follow in the event of incidents or complaints.

**Environmental Concerns**

The principal environmental concern associated with environmental incidents or complaints focus on human and environmental health.

**Environmental Protection Procedures**

All complaints related to the environmental team shall follow the below procedures to attempt to mitigate and minimize the frequency of complaints over time;

1. Immediate action is taken as soon as possible and/or within 24 hours of receipt of a complaint.
2. Investigations completed within 7 days of receipt of a complaint.
3. All corrective actions implemented by the due date.

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All incidents addressed to the environmental team not covered under the plans and procedures included in this document (Waste, spills, animals) are to be addressed as follows:

1. Incidents shall be brought to the attention of the environmental team as soon as possible, within 30 minutes if applicable.
2. Remediation of the incident shall occur as soon as practical following notification of the Environmental Coordinator and Environmental Specialist.
3. Incident investigations shall be documented and filed with the environmental team and include recommendations to prevent the incident from re-occurring.

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**Appendix A-28-Sewage**

**Operational Aspects**

Sewage waste is produced by various on-site processes including the camp kitchen, bathing and washing in the dorm facilities, and septic waste. Proper operation of a sewage treatment facility is essential to maintaining continued operation of the camp facility as well as meeting our legal obligations to treat water.

**Environmental Concerns**

Waste generated from the camp facility is to be directed to the on-site treatment facility. This facility is of the Membrane Bio Reactor (MBR) type. The environmental concerns associated with this facility are largely concerning accidental discharge of septic material.

**Environmental Protection Procedures**

To ensure proper operation of the MBR system;

1. The wastewater technologist shall perform daily maintenance and checks on the MBR system to ensure proper system functionality.
2. Daily logs are to be kept of inspections and maintenance procedures
3. Any incidents or abnormal conditions are to be carefully noted and rectified

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4. In the event of an accidental discharge, powdered lime is to be spread in the vicinity and clean fill placed on top.

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**Appendix A-29-Bear Management**

**Operational Aspects**

During both the construction and operation phases of the project, Black Bears may be present in the project areas. The risks bears present are two-fold; their presence may prove a nuisance to mine operations, and interactions between staff and bears may present a significant risk for both parties. If inclined/motivated, black bears can destroy equipment and facilities on-site and steps must be taken to deter their presence.

**Environmental Concerns**

The principal environmental concern associated with interactions with bears on site is one of causing undue harm or stress to the animal. Bears play a key ecological role as apex predators and long-term interactions between bears and staff (e.g. positive interactions, feeding) may permanently alter the bear’s behavior. In every situation, we must seek to avoid placing stress on these animals or forcing them into a situation where flight is not possible.

**Environmental Protection Procedures**

All interactions between site personnel and bears are to be reported to the security team. At no times are bears to be fed, approached, or otherwise encouraged. Food or other materials which may prove appealing to bears are to be stored in a safe manner.

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1. In order to limit interaction between staff and bears, feeding of bears is strictly prohibited. No food waste shall be disposed of in an area accessible to bears (leftovers, lunch bags, etc.).
2. Bear sightings are to be reported to the security team. Security maintains reports of sightings and deterrent methods. In the event of a bear sighting, two security officers shall respond (when practical) to the area of the sighting and attempt to drive the animal away by:
  - a) Positioning themselves so as to drive the bear away from populated areas, making sure to keep an escape route available to the animal
  - b) Attempt to drive the animal into the woods with loud noises, i.e. clapping, yelling, etc.
  - c) If the aforementioned proves unsuccessful, deterrent devices such as bear bangers or screamers must be used. The security officer must keep in mind bears can quickly become accustomed to these noises.
  - d) If successful, the security officers will maintain a brief watch to ensure the animal does not immediately return to the area. If unsuccessful, a decision by TSMC site management may elect to use the 12-ga rubber bullet shotgun. If this method is chosen, the shooter must be in possession of a PAL (Possession and Acquisition License) and a valid Hunter Education program certificate. The shooter must ensure the area is clear of all personnel and position themselves in a manner which will drive the bear away from the camp. These rubber bullets are to be fired at major muscle groups (shoulder, rump) while avoiding areas which may cause the animal harm (head, stomach).
  - e) If it becomes evident that the animal has become a threat to personnel, a

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- decision may be made by TSMC in consultation with Department of Wildlife officials, to trap and relocate it. Newfoundland and Labrador Department of Conservation will advise us of the procedure and if necessary issue and order to the Quebec Wildlife Division to act.
- f) ONLY in an emergency situation, or when dealing with a particularly aggressive or injured animal will a decision be made to destroy the animal. This decision will be made by TSMC's management personnel in consultation with Department of Conservation officials.
  - g) In any situation in which a bear is injured or destroyed notice must be given to the Environmental manager and the Newfoundland Department of Wildlife. Disposal of a destroyed animal must occur in accordance with Department of Conservation, with a submission of a formal report required within 7 days.

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**Appendix A-30-Snow Removal**

**Operational Aspects**

Snow removal is a crucial aspect for operation of the DSO Timmins site during the winter months of November-May. Snow must be removed from the processing plant, the track infrastructure, the camp area, and the road infrastructure. Snow is typically pushed or piled into areas of the previously mentioned facilities not in use.

**Environmental Concerns**

The environmental concerns that rise from snow removal are largely associated with the potential for contamination on site. During the course of winter operations, spills or other releases of undesirable material or debris may go unnoticed, being pushed, bermed, piled, buried, or otherwise disturbed until spring thaw. Several key areas where snow may be inadvertently contaminated include vehicle maintenance, fueling, and transport. In the spring thaw, these materials may find themselves no longer suspended and may contaminate water or soil on-site.

**Environmental Protection Procedures**

The potential for snow contamination may be negated by applying the following procedures:

1. Every fall, the contractor responsible for snow clearing shall meet with representatives of the environmental and maintenance teams and to determine

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areas for snow to be bermed or piled.

2. Frequent inspections of key areas such as fueling locations, fuel facilities (including reservoirs) and maintenance facilities should occur during winter months in an effort to increase detection.
3. At the discovery of contaminated snow in spring-thaw, immediate efforts are to be made to contain the snow to prevent further melting.

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**Appendix A-31-Silica Testing**

**Operational Aspects**

TSMC is dedicated to following the Occupational Health and Safety Silica Code of Practice. In an effort to control the occupational exposure limits of Silica at the DSO-Timmins Site, TSMC shall implement an ongoing silica sampling program consisting of silica hazard identification, evaluation, control, and worker surveillance. This will be achieved through a series of silica sampling events throughout the year and will serve as a key role in controlling dust at the source and reducing overall dust emissions thus ensuring the overall health of the workers at the DSO-Timmins Site.

**Environmental Concerns**

Silica dust is known to have detrimental effects on human health, and as such all efforts must be taken to minimize its exposure. At the present time, regular testing of mine operations for silicate dust content is an effective means of ascertaining the level of silicate dust on site for comparison against OHS-mandated Threshold Limit Value or TLV.

**Environmental Protection Measures**

The following explains the procedures involved in silica testing:

1. Collect the sample
2. Record sample run time in minutes

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3. Perform post calibration
4. Shut off pump
5. Remove cassette from cyclone and insert the plugs into the inlet and outlet
6. Place cassette into a clear plastic bag
7. Charge pump for next sampling
8. Clean cyclones using soap and water and allow time to thoroughly dry
9. Send samples to an accredited lab for analysis. Requesting NIOSH 0600 for respirable dust and NIOSH 7500 for silica analysis. Both analysis are required to compare MSHA`s TLV

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**Appendix A-32-Nuclear Materials**

**Operational Aspects**

Owing to the presence of nuclear sources on-site inside of the DSOT process plant, TSMC is committed to ensuring complete compliance with all required federal legislation relating to the usage, maintenance, security, transport, and disposal of nuclear sources on site.

**Environmental Concerns**

Nuclear sources are required to be monitored in accordance with Industry Canada guidelines to prevent the potential risk of improper use or disposal.

**Environmental Protection Measures**

The following procedures shall be followed with respect to nuclear sources:

1. All movement of nuclear material on-site must first be approved by Senior Manager, Environment and Permitting.
2. A qualified person(s) on site must be designated to receive nuclear materials as they arrive on-site in accordance with legislation.
3. A qualified person(s) on site must perform regular inspections of the nuclear source and report his findings as required.
4. Upon reaching the end of it's useful life, a qualified person(s) and the Senior

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Manager, Environment and Permitting must dispose of the material in accordance with applicable legislation.

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**Appendix B-1 Fuel and Hazardous Materials: Storage, Handling, and Emergency Response**

SPILL CONTINGENCY  
PLAN

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**Appendix B-2 Wildlife Encounter Contingency Plan**

Wildlife encounters pose a potential risk for stress or injury to both the wildlife and site personnel. To reduce the risk and stress, control measures and environmental protection procedures have been put in place and are shown below. As a protection measure, hunting, trapping or fishing by Project personnel is not permitted on or off site while under the direct or indirect employment of Tata Steel Minerals Canada (TSMC). In the event of a wildlife encounter, the following procedures should be followed;

- Site and working areas shall be kept clean of food scraps and garbage;
- Animal proof disposal containers shall be used and will be regularly emptied and transferred to an approved waste disposal site (as per WMP)
- The on-site landfill shall be regularly maintained, compacted, and covered in order to deter scavenging from wildlife (predominantly bears)
- No personal pets, domestic or wild, shall be allowed on the site
- All sightings of notable species (See table below) should be immediately reported to the TSMC Environmental team in accordance with our wildlife control plan.

Species	Common Name	Rationale
Rangifer Tarandus Caribou	Migratory Woodland Caribou	Threatened
Rangifer Tarandus Caribou	Sedentary Woodland Caribou	Threatened
Euphagus carolinus	Rusty Blackbird	Vulnerable
Gulo Gulo	Wolverine	Endangered/Risk to human

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		safety
Canis lupus labradorius	Grey Wolf	Risk to human safety
Ursus Americanus	American Black Bear	Risk to human safety
Genus Myotis	Bats	Under Review
Vulpes Vulpes	Red Fox	Risk to human safety

***Table 3. Species of note***

In the case of any staff encountering wildlife on site, the following steps shall be followed;

1. If a notable species, the Environment team shall be informed immediately and advised of best course of action
2. If not a notable species, the individual shall proceed with his/her work provided it does not interfere with their personal safety, or the animal in question.
3. In the case of Bears, Wolves, Foxes, or Wolverines, should the animal present a risk to human safety contact shall be made to TSMC Security on TATA 1 to provide for escalating action if required.

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**Appendix B-3 Discover of Historic Resources Contingency Plan**

The Heritage Resource Discovery plan is to be used for reference in the event of the discovery of historic resources on the DSO Site during the construction or operation phases. TSMC is committed to preserving all historic resources in accordance with the *Historic Resources Act (1990)*. The Government of Newfoundland and Labrador defines a historic resource as;

*"historic resource" means a work of nature or of humans that is primarily of value for its archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest, including an archaeological, prehistoric, historic or natural site, structure or object;*

Using this definition, the following procedures shall be followed in the event of a discovery of a historical resource during the construction or operation phases of the DSO Project.

1. The TSMC Environmental department should be made aware of the discovery immediately and all work in the immediate area should be halted. Any heavy equipment being used should be stopped, and not moved until the area is cleared.
2. A representative of the TSMC Environmental department should proceed to the find and document it extensively in a non-intrusive fashion.
3. The findings of the item shall be forwarded to a member of the TSMC community affairs department as well as an archeologist recognized by the Province of Newfoundland and Labrador for review.

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4. Should the item be determined to be a finding of specific interest, a site visit will be organized in conjunction with representatives of the project's adjacent communities, the TSMC Community Affairs department, and an accredited provincial archeologist.
5. The discretion for clearing the site for work continuation will remain, in all times, the decision of the Community Affairs department at the discretion of the provincial archeologist.

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**Appendix B-4 Forest Fires**

Forest Fires are a regular occurrence in Canada’s boreal forest, and as such must be considered for the purposes of contingency planning in the DSO Project. For the consideration of this contingency plan, two scenarios are to be reviewed; Forest fires threatening the DSO Project and its infrastructure directly, and Forest fires threatening the DSO Project indirectly.

**Forest Fires affecting the DSO Project directly**

While the DSO Camp and process facilities can be considered at low-risk for forest fires due to the lack of combustible organic matter, two DSO Project areas can be considered at medium and high-risk for forest fires, respectively. The Goodwood Haul road linking DSO4 deposits with the DSO Process plant, should be considered an area at high risk for forest fires due to the dense, continuous spruce (C-2 Fuel Type). The access road linking Schefferville and DSO3 shall be considered at medium-risk for forest fires due to discontinuous areas of boreal spruce (C-2 Fuel type) in the lowland areas referred to as “DSO 2”. In either situation, the following procedures shall be followed;

1. The incident shall be reported to the appropriate authorities, SOPFEU if the fire is located in Quebec, and Department of Natural Resources if the fire is located in Newfoundland and Labrador at the number listed below;
 

1-866-709-Fire	Newfoundland and Labrador
1-800-463-Feux	Quebec
2. The TSMC representative reporting the incident shall pass onto the appropriate

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government agency the following details;

- Fire location (GPS Coordinates)
- Fire description including; Approximate size, wind direction, wind speed, relative humidity, temperature, weather conditions over fire (clear, cloudy, lightning), flame length, smoke color, geographical features (hills, lakes, etc)
- Resources at risk. Clearly communicate which infrastructure (if any) is being imminently threatened by the fire (Roads, transmission lines, etc.) and which may be threatened as the fire develops.
- Resources available. Clearly state assets at TSMC's disposal which may be utilized in the direct or indirect suppression of wildfires including heavy equipment, water trucks, etc.
- Appoint an incident commander on behalf of TSMC, and mobilize the TSMC fire brigade as a precautionary measure to perform structural protection should it be necessary.
- In the event that the site may be threatened by forest fires, **evacuation of the camp may not be necessary due to the lack of combustible material in the vicinity of the camp.** Should the roads north or south of the camp be threatened, a no-travel order shall be placed, and the road closed with the assistance of the Surete de Quebec until such time that the fire shall no longer impede travel.
- Should personnel be in the DSO4 area and a fire threaten the Goodwood road, a no-travel order should be issued for the Goodwood road, including stopping haulage operations, until the fire passes, the threat diminishes, or both.

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**Forest Fires Threatening the DSO Project Indirectly**

In a situation whereas the DSO Project is not directly threatened, the considerations to be made are two-fold; firstly, precautionary measures should be considered owing to the potential for logistics disruption, and secondly, TSMC should assume the role of assisting agency given the resources at its disposal. In the event of a forest fire in the vicinity of, but not directly threatening the DSO Project, the following steps should be taken.

1. Consideration should be given immediately to short and long term issues potentially facing logistics and the following questions should be asked:
  - Will scheduled or charter air service be affected by service disruptions due to wildfires?
  - Will TSMC-dependent infrastructure be compromised by nearby wildfires? Ie; rented accommodations, municipal water supply
  - Will rail traffic be compromised for an extended period?
  
2. Barring any logistical or safety issues, TSMC should then consider resource sharing in support of wildfire suppression efforts. In this circumstance, the following should be made;
  
3. Contact should be made with the Incident Commander responsible for the fire, and make him available of any resources TSMC may have available to his/her incident, and approximate times the resource may be available (Accommodations, bussing, heavy equipment, manpower, etc.)

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4. A single point-of-contact at TSMC should be arranged, with the responsible person keeping track of all resources being utilized and duration for the purposes of potential cost sharing.

### Appendix B-5 Extreme Weather Conditions

Extreme weather conditions may occur in various seasons over the course of the DSO Project duration. Extreme weather conditions can be classified as follows; Extreme wind events, extreme cold events, white-out events, and extreme precipitation events, each with its respective procedures as outlined below;

#### Extreme Wind Events

An extreme wind event can be considered as any event in which gusts occur in excess of 110 km/h, or sustained wind speed of 90 km/h. In the event of an extreme wind event, the following procedures should be followed;

Data should be relayed from the TSMC Environmental staff regarding present and expected wind conditions utilizing Environment Canada forecasts and on-site weather equipment to the Mine superintendent.

The mine superintendent shall decide a course of action which will provide for worker safety, including but not limited to:

1. Limiting outdoor work
2. Stopping all outdoor work
3. Limiting heavy equipment
4. Stopping all heavy equipment

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5. Issuing a no-travel notice, temporarily stopping travel between DSO3, DSO4, and Schefferville.

**Extreme Cold events**

An extreme cold event can be considered as any event in which temperatures reach, or are expected to reach, -48 degrees Celsius for a period of two hours or greater with or without wind-chill. In the event of an extreme cold event, the following procedures should be followed.

1. Data should be relayed from the TSMC Environmental staff regarding present and expected wind conditions utilizing Environment Canada forecasts and on-site weather equipment to the Mine superintendent.
2. The mine superintendent shall decide a course of action which will provide for worker safety, including but not limited to:
3. Limiting outdoor work
4. Stopping all outdoor work
5. Mandating maximum work periods

**White-out events**

A white-out event can be considered as any event in which visibility descends to a point in which outside travel becomes difficult. In the event of a white out event, the following procedures should be followed.

Data should be relayed from the TSMC Environmental staff regarding present and expected wind conditions utilizing Environment Canada forecasts and on-site weather equipment to the Mine superintendent.

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The mine superintendent shall decide a course of action which will provide for worker safety, including but not limited to:

1. Limiting outdoor work
2. Stopping all outdoor work
3. Mandating maximum work periods



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**Approved By:**

**Date:**

**Appendix D-1 Required Permits**

**Appendix D-2 Required Permit Terms and Conditions**

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**Appendix E- Waste Management Plan**

Tata Steel Minerals Canada Ltd.

**DSO TIMMINS PROJECT**

**DRAFT Waste Management Plan**

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**TATA Steel Minerals Canada Ltd.  
DSO Project Activities**



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**Appendix F-Incident Investigation Report**

<b>PROJECT NAME:</b>	<b>PROJECT NUMBER:</b>	Occurrence	Report Date
<b>CONTRACTOR INVOLVED:</b>		<b>TIER CONTRACTOR INVOLVED:</b>	
<b>Check (4) Incident Type:</b> FIRST AID <input type="checkbox"/> MEDICAL TREATMENT CASE <input type="checkbox"/> RESTRICTED WORKDAY CASE <input type="checkbox"/>			
LOST WORKDAY CASE <input type="checkbox"/> NEAR MISS <input type="checkbox"/> PROPERTY INCIDENT <input type="checkbox"/> ENVIRONMENTAL <input type="checkbox"/>			
OTHER (DESCRIBE) <input type="checkbox"/>			
<b>AREA AND/OR UNIT INCIDENT OCCURRED:</b>			
<b>INJURY INFORMATION:</b> ACUTE <input type="checkbox"/> CHRONIC <input type="checkbox"/>			
Worker(s) Name:		Trade Craft & Class:	Experience:
Nature of injury:		Source of Injury	
Part of Body:		Type of incident: Environmental	
Treatment			
<b>INVESTIGATION TEAM</b> PLEASE PRINT FULL NAMES			
<b>Name/Brass</b>	<b>Company</b>	<b>Position/Trade</b>	
<b>PERSON(S) INVOLVED IN INCIDENT:</b> (please Print)	<b>Trade</b>	<b>Position</b>	<b>Years at Current Position</b>
<b>DESCRIPTION OF INCIDENT:</b> Relevant events that happened prior to the incident, during the actual incident and immediate actions that followed the incident. Who, what, when, where, why and how.			
<b>IMMEDIATE CAUSES</b>			
<b>SUBSTANDARD ACTIONS</b>		<b>SUBSTANDARD CONDITIONS</b>	
<input type="checkbox"/> 1. Operating equipment without authority	<input type="checkbox"/> 17. Inadequate guards or barriers	<input type="checkbox"/> 18. Inadequate or improper protective equipment	
<input type="checkbox"/> 2. Failure to warn			

Double Click to open link

**ENVIRONMENTAL PROTECTION PLAN**

**TATA Steel Minerals Canada Ltd.  
DSO Project Activities**



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**Approved By:**

**Date:**

**Appendix G-Environmental Response Plan**



ERP-April 13th.docx

Double click link to open file



**Environmental Emergency Response Plan  
Tata Steel Minerals Canada Ltd.  
Direct-Shipping Ore Project**

Prepared for:

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**July 18 2013**

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## **1.0 INTRODUCTION**

### **1.1 Commitments**

Tata Steel Minerals Canada Ltd. (TSMC) is committed to the provision of adequate resources to implement and maintain the Emergency Response Management System for its activities, including the necessary human, material, and financial resources.

### **1.2 Purpose and Scope**

This Emergency Response Plan (ERP) has been developed by TSMC to identify potential emergencies that could arise during the construction and production phases of the Direct Shipping Ore Project in western Labrador/eastern Québec (the Project) and to establish the framework for responding to these situations. This ERP serves as a tool in attaining TSMC's goals and objectives in terms of environmental management. It can be used as a reference document during the planning and execution of the Project, and as a field document to provide quick guidance to workers undertaking specific tasks outlined in the ERP. At the corporate level, the ERP serves as a working document to ensure that compliance with environmental policies and legislation has been achieved.

This ERP outlines the best practical procedures to address the prevention of, preparedness for, response to, and recovery from environmental emergencies caused by uncontrolled, unplanned, or accidental releases of any toxic or hazardous substances currently listed under Schedule 1 of the Federal E2 regulations (Appendix A). The plan will be updated annually to reflect specific responses, protocols, response teams and management contact information (once established), as well as any changes in regulations.

### **1.3 Guiding Principles**

Emergency events or situations are characterized by immediate threat to life, health, safety, environment, or property. The ERP is designed mainly to address the environmental characteristics using the following principles:

- Ensure safety and well-being of personnel, the environment, and property
- Identify evacuation routes and muster station locations
- Ensure effective communication between personnel and the emergency team
- Ensure that procedures exist to respond to, intervene, stop, or limit the emergency situation
- Initiate response procedures and follow-up programs for emergencies
- Ensure when occurrences are investigated, root cause determinations are made and mitigation measures are implemented to prevent re-occurrence.

### **1.4 Definitions**

**Spill:**

**Federal and NL Provincial:** A spill is a leak or release of >70 L on land, or of any amount into aquatic environments, of a liquid material, which may be petroleum products or otherwise hazardous, from the storage tank, pipeline or other container in which it is stored or being transferred.

**QC Provincial:** A spill is a leak or release of any amount on land or into aquatic environments, of a liquid material, which may be petroleum products or otherwise hazardous, from the storage tank, pipeline or other container in which it is stored or being transferred.

**Hazardous Material:** Any chemical, radiological, or biological material that is potentially hazardous to health, safety, property, or environment, including 'Hazardous Products' as defined under the *Hazardous Products Act* and 'Dangerous Goods' as defined under the *Transportation of Dangerous Goods Act*.

## **1.5 Regulatory Framework**

This ERP has been developed to ensure that TSMC respects all applicable laws, regulations, and requirements for Federal and Provincial authorities. As the Project is situated on the Québec/Labrador border, applicable regulations and reporting requirements will depend on the activities or emergencies jurisdiction. The following regulatory and government documents constitute an integral part of the plan:

- Environmental Emergency Regulations (Canada wide)
- Canadian Environmental Protection Act (Canada wide)
- Hazardous Products Act (Canada wide)
- Transportation of Dangerous Goods Act (Canada wide)
- Environmental Protection Act (NL) and associated documents (Labrador activities)
- Loi sur la qualité de l'environnement (L.R.Q., c. Q-2) (Québec activities)
- Règlement sur les matière dangereuses (Q-2, r.32) (Québec activities)

## **1.6 Organization and Responsibilities**

### **1.6.1 Emergency Response Team**

The Construction/Operations Manager, and the environment and permitting department, are responsible for establishing and implementing the environmental response team. The team will comprise site employees who receive special training to assist in an emergency. The above noted managers will select qualified candidates in sufficient numbers to facilitate the response programs required by the plan as well as a designated Emergency Coordinator to coordinate activities in the event of an emergency and to make final decisions. The Emergency Coordinator will be in charge of coordinating efforts between internal personnel as well as with external contact agencies if necessary. The Emergency Response Team will receive the special training required for adequate response to onsite emergencies. The team will be trained in appropriate procedures to:

- Implement onsite emergency response procedures
- Assist with evacuation procedures
- Respond to emergencies involving fires or explosions

- Control and mitigate spills or other accidental releases.

Mock exercises, including spills, evacuations, and other potential emergencies, will be conducted regularly (at least quarterly) to ensure the success of this plan. Training and exercises will ensure that employees develop and maintain the skills necessary to respond quickly and effectively to emergency situations, as outlined in the ERP, and are familiar with the hazards and materials which are generally used and stored on site. The employees will be able to locate and know how to operate response equipment, and will be in a position to effectively contact off-site resources if necessary.

TSMC's emergency personnel contact information is presented in Table 1.1 and will be updated as responsibilities are assigned.

**Table 1.1 Emergency Contact Information for TSMC Personnel**

<b>Person</b>	<b>Title</b>	<b>Contact Information</b>

## **1.7 Relationship to Other Plans**

The Emergency Response Plan builds upon and is complementary to the existing Environmental Protection Plan (EPP). The Train Operator Spill Management Plan, Fuel Farm Management Plan, and Waste Management Plan (used oil) are under construction and will be considered as inclusions as appendices to the ERP.

## **1.8 Update of this Emergency Response Plan**

The Emergency Response Plan will be regularly updated on the basis of:

- Management reviews,
- Incident investigations,
- Regulatory changes,
- Changes to the Emergency Response Team
- Changes to Emergency Response procedures, and
- Other project related changes.

## **2.0 LOCATION OF STORAGE FACILITIES**

Fuel will be brought in by rail with the main fuel storage location at the fuel farm, and secondary storage at the plant (Figure 2-1). Fuel will be transported by pipeline from the fuel farm to the site, the plant, the garage, and to the light vehicle fueling station. Fuel will also be transported by truck along the Goodwood Road and around site to fuel mobile equipment.

In addition to fuel, other supplies, including oil, will arrive by rail and will be stored in select locations (to be determined - TBD).

Laboratory supplies and chemicals such as chlorine will be present onsite in small quantities and are not covered under the ERP. Laboratory chemicals will be properly stored and labeled as per Workplace Hazardous Material Information System (WHMIS) regulations, and will be handled by trained employees.

Untreated sewage will be transported by pipeline to one of two planned treatment facilities, either at the plant or the camp. Liquid waste from the plant will be transported to the camp via an approximately 3 km long pipeline, while solids will be transported by truck as needed.

Coagulants (i.e., flocculants) for ore processing will be present and used in the plant section of the Project. Composition and quantities are to be determined.

Glycol will be present on site in quantities and locations to be determined.

Ammonium nitrate and explosive materials will be stored offsite at a storage facility operated by an independent contractor (see Figure 2-1). As only small amounts of prepared explosives will be present onsite at any point in time, explosives and emulsions are not covered in depth in this ERP and will be the responsibility of the contractor.

## **2.1 Hazardous Waste**

Hazardous waste storage may include any used product that must be removed by qualified contractor, including oil. As heavy equipment operations are through an independent contractor, used oil storage and removal will be, for the most part, the responsibility of said contractor. Only small amounts of used oil from two generator sets will temporarily be stored in the 'used oil room' (location to be determined) until it can be removed from site via a qualified contractor (Naskapi Waste Management).

Soils contaminated with hazardous waste are covered under 'Regulations respecting contaminated soil storage and contaminated soil transfer stations in Québec (chapter Q-2, r.46) and under the Environmental Protection Act (Section 26(2) and 29(a and b)) in Newfoundland and Labrador. Any contaminated soils shall be excavated and removed from site by a licensed waste disposal contractor or sent for remediation on site. Temporary storage locations and regulations vary with varying concentrations of hazardous material in the soil, however, it is best practice that soils be placed in a leakproof container on an impermeable surface, and protected from bad weather. At minimum, contaminated soils will be placed in an lined and bermed containment area where contaminated water (i.e., rain runoff) can be removed periodically and sent for treatment. Volumes should not exceed 50 m<sup>3</sup> per site or be stored in excess of 180 days.

Soils contaminated with small amounts of oil, diesel, grease, or other hydrocarbons will be stored onsite in approved containers until removal via qualified contractor. Soils contaminated by excess volumes of hydrocarbons that prohibit soil removal will require recovery of free product and will undergo onsite remediation. Only small amounts of contaminated soil are expected to be stored on site at any given time.

## **2.2 Fuel Shipping**

Fuel shipments to site will occur on a regular basis during both summer and winter. Shipment will be by rail with a train hauling 12 fuel wagons per week during the summer months, and 12 fuel wagons every two days during the winter months (approximately). Fuel wagons will be double walled and will only be parked for short periods of time (exact time TBD) while awaiting transfer to the fuel tanks, and thus berming will not be required around the full rail yard. To contain any potential spills during fuel transfer berming will be present under and around the rail section where fuel contents will be transferred to the fuel tank. Furthermore, spill kits will be available in the immediate vicinity of the fuel transfer station. While waiting for the rail line to be completed, a fuel truck will be delivering fuel to the site from Shefferville with approximately (X number) of shipments per week.



## **3.0 GENERAL RESPONSE TO EMERGENCIES**

### **3.1 Equipment and Personal Protection**

Emergency response equipment will be strategically placed primarily in areas of fuel handling to facilitate immediate first response in the event of a hydrocarbon or hazardous material release to land or water. Equipment will include spill kits and fire extinguishers. The equipment will be sized appropriately and able to accommodate an effective spill response affecting the largest container present. Absorbent materials of sufficient quality and quantity, as appropriate for their locations and potential use, shall be placed in areas of fuel storage. Appendix B provides a list of the different spill kits and the minimum recommended contents that are to be available onsite. Over the course of operations, when materials in spill kits have been utilized, they will be replaced immediately. In addition to spill response material, a variety of mobile heavy equipment including excavators, front-end loaders, bull-dozers, and haul-trucks are available to aid in spill response and recovery efforts. In case of emergencies involving bodily harm, first aid kits will be placed in strategic locations, including fuel storage areas.

The appropriate supervisor will approve a list of the necessary spill response equipment, clean-up material, and devices that are required for each work location before commencement of work (i.e., fuel farm, mobile fueling stations). Material Safety Data Sheets (MSDS) are required to assess potential hazards associated with spills of petroleum or chemically based materials. MSDS will be kept at the Safety office and the environmental team will ensure that the list is accurate and up to date at all times.

### **3.2 Communication**

Effective communication systems are critical to the success of emergency response. The following provides an overview of communication procedures to be followed in an emergency event. Main communication systems will be used internally to alert workers to danger, convey safety information, and maintain site control. The main system will

consist of alarms or short signals that are easily conveyed and understood by audible signals. Radios will be used when work teams are working away from the main communication systems.

During an emergency, a dispatch station (Security) will be contacted immediately. The dispatch station will be manned 24 hours a day by onsite personnel and will be equipped to handle all radio and telephone communication in case of an emergency. In the event of an emergency, there will be prompt notification of appropriate individuals including the Construction/Operation Manager, the environment and permitting department, the site safety lead, environmental lead, the emergency response team, medical staff, and the on-site company manager.

An appropriate pre-designated company manager or employee will be charged with external communication during emergencies<sup>1</sup>. Meetings will be held to inform the local community and the public about onsite accidents, spills, or emergencies, if necessary. Tata corporate will coordinate dissemination of information to the media whenever necessary.

### **3.3 General Evacuation Procedures**

All employees will be instructed about emergency procedures during site orientation. Muster location maps showing evacuation routes will be posted at conspicuous places throughout the site including working areas, facilities, and notice boards. A muster list will be prepared and posted with the muster map. The list will provide information about emergency signals, instructions for operating emergency alarm systems, and the responsibilities of personnel. The list will be updated periodically to address current emergency response needs.

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<sup>1</sup> Tata corporate will handle external communication whenever possible.

## **4.0 RESPONSE ACTIONS TO EMERGENCIES**

### **4.1 Initial Responses**

Project personnel working at a site or at a facility may be the first to encounter an emergency and will be expected to initiate a response action. In such an emergency, a general response will be followed before any other activities. The general procedures include the following:

- Avoid danger to yourself, others, or the environment,
- Prevent further environmental effects, loss of material, or damage to equipment if this can be done safely,
- Report to the appropriate supervisor the type and location of the emergency as well as hazards present and other health and safety concerns,
- Communicate with individuals in the vicinity of the emergency to preliminarily assess their condition,
- Assess the size and severity of the emergency (i.e., minor or major)
- Ensure the safety of personnel and evacuate to a temporary safe location, if necessary.

### **4.2 Response Action**

Response actions are considered briefly for environment related situations. A minor incident does not interrupt site operations, is not life-threatening, and does not result in any substantial environmental damage. In the event of a minor incident, onsite resources will be required to remedy the situation. Evacuation or offsite resources will not be necessary, and the environment and permitting department can coordinate response.

A major or serious emergency may be an emergency that requires an interruption to the site operations. The incident may be life threatening and could involve substantial environmental or property damage. A serious emergency may require offsite resources for effective response. In the event of a serious emergency, further severity will be assessed by the Operation/Construction manager. In consultation with the environment

and permitting department, a decision will be made whether on or both onsite and offsite resources will be needed to remedy the situation.

In the event that multiple incidents occur simultaneously at the same location, their cumulative effects will be exponentially greater than the effect of any singular incident or emergency. TSMC will be prepared to handle a number of minor incidents, or a combination of major and minor incidents with effective response plans and training in place. All sites will be equipped with adequate spill response plans and training in place. In the event of multiple major incidents at the same location, severity will be assessed by the environment and permitting department and if necessary offsite resources will be called in for an effective response.

## **5.0 OPERATIONAL INCIDENTS**

### **5.1.1 Fires**

Firefighting equipment, including extinguishers, pumps, and hoses will be stationed at various work areas including shops, the fuel farm and dispensing areas, fuel trucks, kitchens, generators, and anywhere fuel or flammable material is regularly handled. Personnel will be evacuated from site if a fire cannot be immediately controlled or impacts necessities of life or personnel safety. Trained onsite personnel will respond to fires using onsite equipment. Regulatory authorities will be notified as needed. All on-site personnel will be trained in the use of fire extinguishers, and all Emergency Response Team personnel will be trained in the use of all firefighting equipment.

### **5.1.2 Shipping Accidents**

Accidents involving light vehicles, fuel trucks, or any other vehicle (i.e., train) transporting fuel or other hazardous material covered under Schedule 1 will be reported to a supervisor and/or dispatch as soon as possible to initiate the Emergency Response Action. Priority response, if warranted will be given to necessities of life, and, if a fuel spill has occurred, the spill plan will be initiated.

### **5.1.3 Fuel and Other Chemical Spills**

A spill response plan is developed specifically to address fuel and other hazardous materials spills (Section 7).

### **5.1.4 Explosives**

Very small amounts of 'prepared' explosives will be onsite at any given time. Explosive materials and their individual components (i.e., ammonium nitrate) will be housed offsite through an independent contracting company. In the event of any explosives related issues, an immediate evacuation of the surrounding area would occur and the Emergency Coordinator would deploy the Emergency Response Team.

## **5.2 Multiple Emergencies**

Multiple emergencies can occur either by coincidence or by one incident leading to or causing another. In the case of multiple emergencies, the guiding principles outlined in Section 1.3 will provide direction for appropriate response action. The emergency team will anticipate potential multiple incidents that could occur due to the occurrence of an emergency and be prepared to take actions as may be required. Sufficient resources will be available to address the potential for multiple emergencies. The Emergency Coordinator, assisted by the environment and permitting department, will coordinate response actions and will determine the order in which incidents will be addressed (i.e., potential injuries to employees or public, fuel spills in waterways, fuel spills on land).

## **6.0 ROLES AND RESPONSIBILITIES**

As part of the ERP, TSMC is responsible for implementing, through its project management team, the following procedures with regards to emergencies:

- Train site personnel in emergency and spill response procedures and the proper use of response equipment and materials,
- In the event of an emergency or spill, mobilize required site personnel, equipment and tools,
- Implement the required health and safety procedures at the site of the emergency or spill,

- Eliminate the fire hazards and potential ignition sources near the emergency or spill area,
- Control the source of the spill (i.e., reduce or stop product discharge),
- Contain the spilled product using the most appropriate methods and equipment (i.e., dykes, ditches, sorbent materials, containment booms, and other barriers),
- Evaluate the possibilities of recovering spilled materials,
- Obtain, if required, assistance from government agencies such as the Provincial Governments, Environment Canada, or Fisheries and Oceans Canada,
- Obtain, if required, additional assistance by hiring local help from the nearby community or firms specialized in spill response operations,
- Comply with applicable guidelines and regulations,
- Conduct a preliminary assessment of environmental impacts to freshwater and terrestrial ecosystems and natural resources,
- Report the spill<sup>2</sup> to the Government of Newfoundland and Labrador (through the Fisheries and Oceans Canada hotline) and/or Québec (applicable province to the spill), to Environment Canada, the Kativic Regional Government (if applicable), and to the water license inspector within 24 hours of the event, and submit a written spill report using the appropriate form (see Section 9 on Reporting Requirements. Note: spill reporting will be issued or approved by Tata corporate office; all communications with government and First Nations shall be approved by TSMC),
- Investigate every occurrence, regardless of damage or injury, to determine root cause and implement control measures to prevent reoccurrence.

## **6.1 Response Management Structure**

All spill procedures and response functions are to be implemented through the Emergency Response Management Team. Table 6.1 presents the management team responsible for overseeing emergency spill response operations and their contact information.

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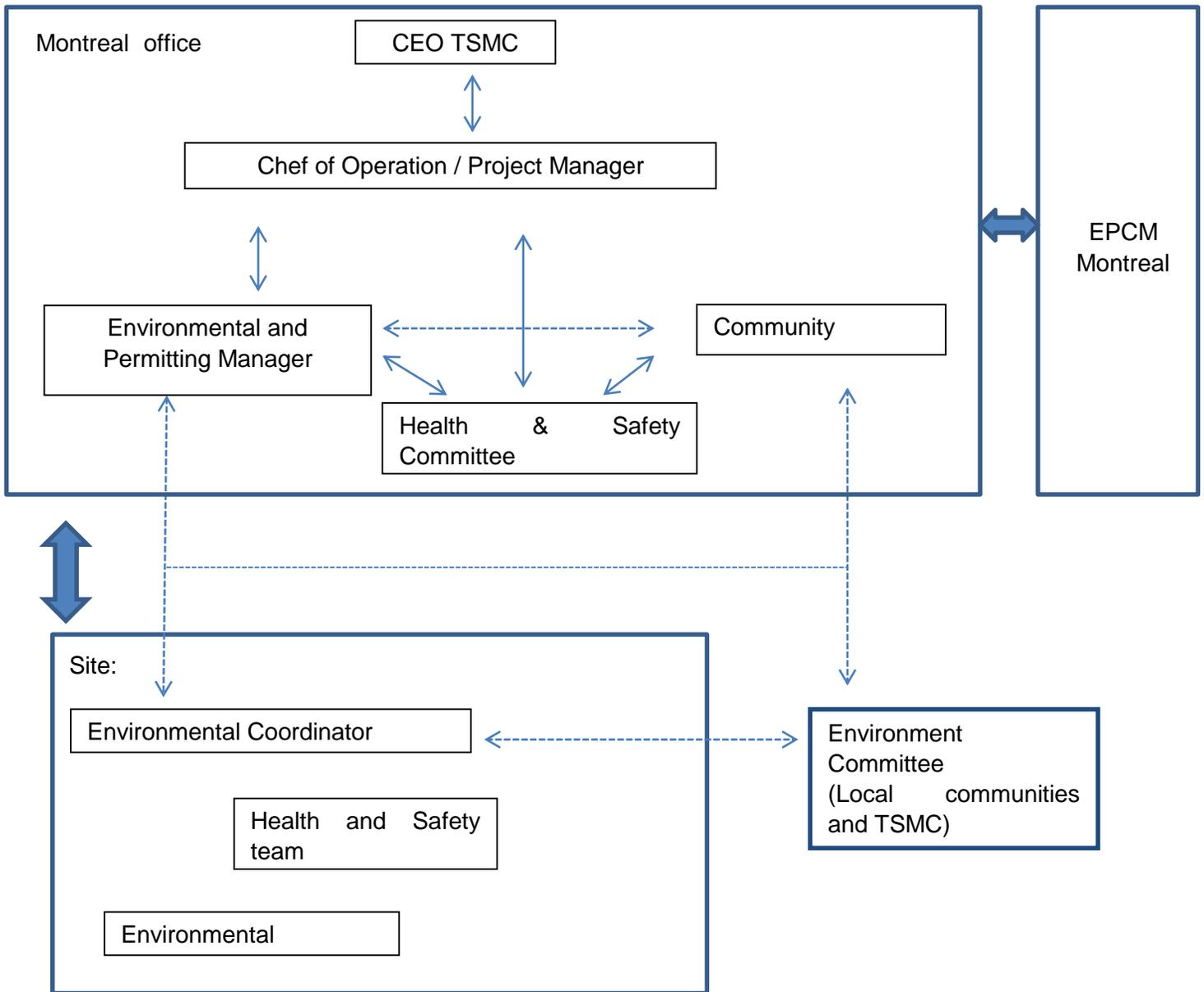
<sup>2</sup> Reporting spills on land are required for any amount in Québec and over 70 L in Newfoundland. Spills of any amount entering water require reporting in both jurisdictions.

Once a spill event is reported, a specific strategy for containment and clean-up will be the responsibility of the environmental team leader or environmental site representative in cooperation with Safety and security; priority is given to the Safety and security. Other site personnel such as the Fire Chief, Manager of Environment and Permitting, Environmental Coordinator, Environmental Technicians, Safety Officials, and Construction/Operation Manager may act as technical advisers before and during the intervention. The trained Spill Response Team will conduct all emergency spill response operations under the leadership of the Environmental Lead. During the cleanup phase of the intervention other site personnel (e.g., heavy equipment operators, labourers) could be involved in the intervention.

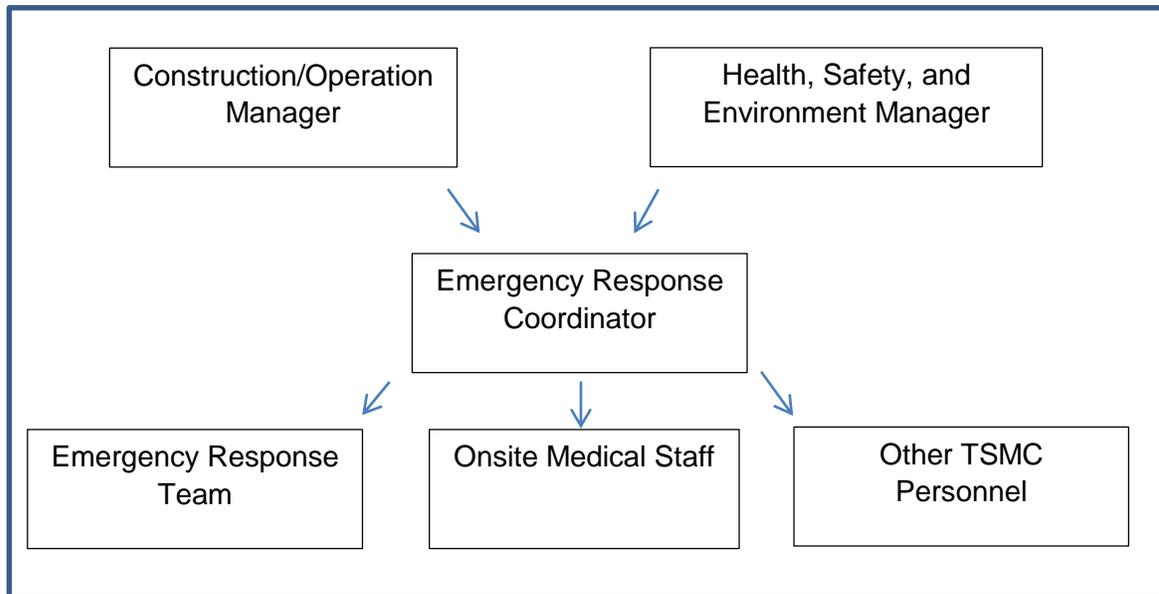
The Management Organizational Chart is provided as Figure 6-1, and the Spill Response Team organization chart is provided as Figure 6-2.

**Table 6.1 Emergency Response Management Team**

Name	Contact Information	Role



**Figure 6.1 Management Organization Chart (reproduced from EPP)**



**Figure 6-2 Environmental Response Organization Chart**

### **6.1.1 Emergency Response Coordinator**

As part of the emergency response plan, the Coordinator, acting as incident commander, is responsible for implementing the following procedures:

- Assume authority over the scene and personnel involved,
- Activate the Emergency Response Plan,
- Evaluate the initial situation and assess the magnitude of the emergency (i.e., spill),
- Develop an overall plan of action,
- Collect photographic records of the event and cleanup efforts,
- Prepare a root cause analysis and an incident investigation for major emergencies,
- Report to the Construction Manager and provide recommendations on resource requirements (additional manpower, equipment, material) to complete the cleanup effort. The responsibility of the coordinator is to mobilize personnel and equipment to implement the cleanup.

### **6.1.2 Manager of Environment**

The responsibilities of the environment and permitting department include the following:

- If a spill has occurred, report it to the appropriate Tata representative at the corporate level for prompt reporting to provincial and federal regulators, the nearby communities, and the Kativik Regional Government (if spill is in Québec).
- Provide liaison with management to keep them informed of cleanup activities,
- Collect photographic records of the spill event and cleanup efforts,
- Obtain additional required resources not available onsite for spill response and cleanup,
- Act as the spokesperson with government agencies as appropriate,
- Document the cause of the spill and effectiveness of the cleanup effort, and recommend the appropriate measures to prevent a recurrence of the spill,
- Prepare and submit follow-up documentation required by appropriate regulators,
- Ensure that the spill is cleaned up and follow-up communication and reports with the appropriate regulators (NL, QC, Federal, Kativik).

### **6.1.3 Corporate Contact**

The responsibilities of the Corporate Contact include the following:

- Work with the environment and permitting department on regulatory follow-up as necessary,
- Act as the spokesperson with government agencies as well as the public and media on any significant spill events,
- Assist with acquiring of off-site resources as necessary.

### **6.1.4 Other Site Personnel – Responders**

All responders are to be trained under the Emergency Response Plan outlined in Section 6.3. The specific tasks of responders are outlined in accordance with the spill scenarios outlined in Section 8, as applicable.

### **6.1.5 Onsite Medical/Rescue Team**

Depending on the scale of the spill/scenario, fire response and the on-site medical team may be necessary and will be initiated if required.

### **6.1.6 Shipping Companies**

When shipping hazardous materials to and from the site, transport companies are required to carry out their operations in accordance with federal and international Transport of Dangerous Goods Regulations.

## **6.2 Regional Environmental Emergencies Team (REET)**

Environment Canada's Regional Environmental Emergencies Team (REET) is a multi-agency, multi-disciplinary group specializing in environmental emergencies. REET is designed to provide consolidated and coordinated environmental advice, information and assistance in the event of an environmental emergency. REET members represent several federal, provincial, and municipal government departments, aboriginal communities, private sector agencies, and local individuals.

During emergency response situations a REET operates as a flexible and expandable multidisciplinary and multi-agency team brought together to obtain and provide comprehensive and coordinated environmental advice, information and assistance to the Emergency Coordinator.

## **6.3 Training**

The environment and permitting department will be responsible for coordinating emergency response training onsite. The Emergency Response Team will participate in training and emergency response exercises to ensure that all members are trained in equipment use and emergency response methods. The Emergency Response Team members will be trained in emergency identification and currently accepted response action techniques. Training will be related to specific emergency response roles, and will include:

- Emergency chain-of-command,

- Communication methods and signals,
- Emergency equipment and use,
- Emergency evacuation,
- Offsite support and use,
- Firefighting,
- Spill response; and
- Spill recovery operations.

Emergency personnel will receive training in first aid and cardiopulmonary response (CPR) and will practice hands-on rescue techniques. Employees will undergo formal safety and emergency response training. The training will identify site-specific hazards and hazards associated with the project in general. The training will also review standard operating procedures, use of personal protective equipment, signaling an emergency, evacuation routes and muster locations, reporting and notification protocol, and other general safety procedures.

As part of the site orientation and ongoing awareness training, all site personnel are informed that any spill of fuel or other hazardous liquids or solids, whatever the extent, has to be reported to their immediate supervisor.

An appropriate number of site personnel will be selected and appropriately trained to form the Emergency Response Team. Crew members will be trained in emergency spill response procedures and operations. Training includes knowledge in the following:

- Properties of hazardous materials used onsite (including proper storage, transportation, handling, and disposal e.g., WHIMS, HAZWOPER),
- Common causes of spills,
- Environmental effects of spills,
- Fire prevention,
- Firefighting,
- Worker health and safety during emergency intervention,
- Personal protective equipment and clothing,
- Spill response procedures and techniques on land, water, snow, and ice, and during all four seasons; and

- Spill response equipment and materials.

## **6.4 Hands-on Training and Deployment**

Hands-on training will include:

- Review of inventory of spill equipment,
- Hands-on instruction – boom connections, tow bridles, rope handling, basic knots, and attachment and deployment accessories,
- Simulated deployment of booms and related gear on and off water using appropriate vessels or vehicles; and
- Debriefing and lessons learned.

## **6.5 Exercises**

Following the regular delivery of training (see previous section), a comprehensive spill exercise will be undertaken in order to reach and maintain an appropriate level of competency. The exercise is structured to test the readiness of both management and responders, and to practice and validate the logistics of the deployment of spill gear. The exercise content will be different from year to year so that it can best validate the various elements of the ERP and the appropriateness of the response. Factors that will be evaluated include:

- Activation of the ERP,
- Effectiveness of management response,
- Site safety,
- Communications,
- Equipment deployment for specific scenarios; and,
- Reporting and coordinating with external agencies.

## **6.6 Communication**

The types of communications for which members of the team will participate include the following:

- Spill reporting protocols,

- Formal written correspondence with stakeholders,
- Design, construction, and planning meetings,
- Field inspection and monitoring reports disseminated by the environment and permitting department,
- Electronic communication,
- Toolbox meetings,
- Formal written correspondence and meetings with government regulatory bodies; and,
- Formal environmental awareness training.

Communication will be appropriately recorded and filed for future reference. Where appropriate, the copies of communications will be forwarded to the Construction Manager(s).

## **6.7 External Communication**

Effective forms of communication include the proactive notification to external stakeholders of project activity. Project activity updates will be provided to the communities of the region through various means including regular meetings, public notices, and radio announcements as appropriate. All media communications are to be from a single designated source (Tata corporate office); all other personnel will be trained to refer media inquiries to that source to avoid making any other statements.

## **7.0 SPILL RESPONSE PROCEDURES**

A spill is defined as the discharge of a hazardous product out of its containment and into the environment. Potential hazards to humans, vegetation, water resources, fish and wildlife vary in severity, depending on several factors including nature of the material, quantity spilled, location, and season (see Section 7.7 – Wildlife protection procedures). Diesel is the main product that may be spilled and therefore spill response procedures focus on this hazardous material. Other chemicals that may be spilled include sewage water, coagulant, glycol, small quantities of lubricants and oils, and releases of gaseous material. Note that spill response procedures will be different depending on the magnitude and nature of the release. A diesel spill of five liters can easily be contained

and cleaned by one person, while a spill of a larger magnitude will be much more hazardous and require more personnel.

All site personnel are trained on the procedures to be followed to report a spill and initiate spill response. The first person to notice a spill will take the following steps:

1. Immediately warn other personnel working near the spill area,
2. Evacuate the area if the health and safety of personnel is threatened,
3. In the absence of danger, and before the spill response team arrives at the scene, take any safe and reasonable measure to stop, contain, and identify the nature of the spill,
4. Remove any source of ignition in the immediate vicinity.
5. Notify dispatch and/or the environment and permitting department, who will initiate the spill response operations.

All spill response interventions carried out by the spill response team follow these general procedures:

**Safety** – Reduce or prevent the danger to persons in the area. If the spill cannot be approached due to fire (or potential for fire), magnitude of spill, or substance (i.e., corrosive or other highly dangerous material), the area should be immediately evacuated until it is safe to approach the spill (i.e., proper PPE or spill response equipment).

**Source Control** – If it is safe to do so, reduce or stop the flow of product without endangering anyone. This could involve very simple actions such as turning off a pump, closing a valve, or sealing a puncture hole with almost anything handy (e.g., a rag, piece of wood, tape), raising a leaky or discharging hose to a level higher than the product level inside the tank, or transferring fuel from a leaking container or tank.

**Control of Free Product** – Prevent or limit the spread of the spilled material. Accumulate/concentrate spilled product in an area to facilitate recovery. Barriers positioned down-gradient of the spill will slow or stop the progression of the spill. Barriers can consist of absorbent booms, dykes, berms, or trenches (dug in the ground or in ice).

**Protection** – Evaluate the potential dangers of the spill to protect sensitive ecosystems and natural resources. Block or divert the spilled material away from sensitive receptors. This can also be achieved by using various types of barriers. Wildlife protection procedures may be necessary.

**Clean up the Spill** – Recover and containerize as much free product as possible. Recover and containerize/treat contaminated soil, water, and snow. Pressure-wash contaminated bedrock surfaces, shorelines, and ice, and recover as much of the oily water as possible for containerization and/or treatment. It is imperative to minimize the disturbance to the area as much as possible.

**Report the Spill** – Collect basic information such as date and time of the spill, type and amount of product discharged, photographic records, location and approximate size of the spill, actions already taken to stop and contain the spill, meteorological conditions and any perceived threat to human health or the environment. Reporting requirements are presented in Section 9. **Spill reporting is coordinated by Tata Corporate.**

## **7.1 Prevention**

Taking necessary steps to prevent the occurrence of a discharge into the environment is prudent both economically and environmentally as spills increase operating costs and lower productivity. Preventative measures can include putting containment measures into place (covered in the following section, i.e., berms and dykes), or focused methods of preventing a spill. These include:

- Ensuring valves are protected from being bumped and are properly closed,
- Hoses and tanks are regularly inspected for signs of cracking,
- Barriers are in place to protect fuel tanks and lines such as described in *Storage and Handling of Gasoline and Associated Product Regulations CNLR 58/03*,
- Vehicular access to fueling areas is for authorized personnel and only for necessary activities (i.e., maintenance or fueling),
- Training of personnel conducting fuel transfers; and,
- Attendance for duration of all fuel transfers.

## **7.2 Spills on Land**

Response to spills on land will include the general procedures previously detailed. If a large spill is suspected (>5 L) or there is a spill into water, immediately contact dispatch or the environment and permitting department by radio or telephone to initiate the Emergency Response Plan. For smaller spills that are contained and do not pose a threat to enter a water body, contact your supervisor and the environment and permitting department to report the spill and for instructions on cleanup. Note that depending on the magnitude of the spill, the steps outlined below may vary in order (e.g., if you knock over a 25 L fuel canister and there is no immediate danger, pick up the canister to stop the flow of fuel and place spill pads on the surface prior to contacting security). The following procedures outline response to a diesel fuel discharge; however they can be applied to any low density (i.e., floating) liquid spill. Miscible liquids (mixes readily with water) will be covered separately in Section 7.3.2. A condensed, step by step version of these procedures can be found in Appendix C.

### **7.2.1 Safety**

Safety is of utmost importance. Immediately warn other personnel working in the area. Before approaching a spill, the immediate vicinity should be evaluated for any hazards or potential sources of fire. Sources of fire should be extinguished and/or removed from the area. When approaching a large spill, always approach from upslope or perpendicular to the slope in order to avoid contact with any free flowing material. Where possible, approach the spill from upwind to avoid any gases or the potential of a runaway fire if one were to occur. Do not approach the spill if it is not safe to do so or if proper PPE is not on hand. If possible, ensure that a fire extinguisher is nearby at all times. In case of fire, avoid being surrounded by fuel on all sides (i.e., always have an exit route).

### **7.2.2 Stop Free Flow of Product**

When it is deemed safe to approach the spill, the first steps should involve reducing or stopping the flow of product whenever possible. As noted above, this could involve very simple actions such as turning off a pump, closing a valve, or sealing a puncture hole with almost anything handy (e.g., a rag, piece of wood, tape), raising a leaky or

discharging hose to a level higher than the product level inside the tank, or transferring fuel from a leaking container or tank.

### **7.2.3 Reporting**

After attempting to stop or reduce the flow of product, immediately contact security and/or your supervisor by radio or telephone. If possible, do not leave the location of the spill provided it is safe to do so. Have someone else call security if a radio or telephone is not available. Security will initiate the spill response team. Ensure to report your location to the dispatcher (e.g., north side of the crusher, km 10 north on the Goodwood Road.), report the nature of the spilled material (e.g., diesel fuel), the volume of spilled material (approximate), the direction of flow (e.g., towards a river, into a wetland) and whether fuel is still being discharged.

### **7.2.4 Containment**

After source control and reporting, containment of the spill is the next priority. The main containment techniques involve the use of two types of barriers: dykes and trenches. Selecting the type of barrier depends on the ground surface and available materials. For example, a trench would not likely be dug when booms are available. Either type of barrier should slow the progression of the spill and serve as containment to allow recovery of the spilled product. Barriers should be placed downgradient (down-slope) from the source of the spill, and as close as possible to the source of the spill in order to minimize the affected area. If a spill cannot be rapidly or easily contained, it should initially be diverted away from any source of water.

#### Dykes

Depending on the volume spilled, the site of the spill, and available material at the site, a dyke may be built with soil, booms, lumber, snow, or other suitable items. A plastic liner should be placed at the foot of and over the dykes to protect the underlying soil or other material and to facilitate recovery of the spilled product. A plastic liner will also decrease the permeability of the dyke. Dykes should be constructed in a manner to accumulate a thick layer of free product in a single area (V-shaped or U- shaped with the spill on the open side of the V or U).

### Trenches

Trenches are useful in the presence of permeable soil and when the spilled fuel is migrating below the ground surface. A plastic liner should be placed on the down-gradient edge of the trench to protect the underlying soil. Liners should not be placed at the bottom of the trench so water is allowed to continue flowing underneath the layer of floating oil (if applicable). Similar to dykes, trenches can be built in a V or U shape to accumulate the spilled material. Also related to trenches, a simple excavation can be made in an area of slightly lower elevation where spilled material will pool. Recovery of spilled material is covered under Section 7.2.5.

### **7.2.5 Recovery**

Once the product has been contained, the next step is to recover and containerize the product. The use of large quantities of absorbent materials to recover higher volumes of spilled fluids should be avoided if possible. If ponding has occurred, large volumes of free-product should be recovered and containerized by using vacuums and pumps appropriate to the spilled material. Mixtures of water and fuel may be processed through an oil-water separator during or following recovery. Absorbent sheets should be used to soak up residual fuel on water, on the ground (soil and rock), and on vegetation. Dry absorbent material such as treated peat moss may also be sprinkled on vegetation to absorb films of petroleum products.

Smaller spills that have largely been absorbed into the top layer of soil can be excavated by hand using a spark resistant shovel or by using heavy equipment. Contaminated soil should be placed in a weatherproof container and disposed of properly (see Section 2.1 – Hazardous Waste).

### **7.2.6 Remediation**

Subsequent to the initial response and recovery, Tata will remediate the affected area and confirmatory sampling will be conducted to ensure a thorough clean up. Excavated areas will be backfilled with uncontaminated soil following clean up.

## **7.3 Spills into Water**

Response to spills near or into water include the general procedures previously detailed in Section 7.2, including safety, stopping the free flow of product, and reporting. The containment procedures listed in Section 7.2.4 can serve to keep spilled material away from any water bodies and as a source control. Various containment, diversion, and recovery techniques for spills into water are discussed in the following sections. The following elements must be considered when conducting response operations:

- Type of waterbody or water course (lake, stream, river, wetland);
- Water depth and surface area;
- Wind speed and direction;
- Type of shoreline; and
- Seasonal considerations (open-water, freeze-up, break-up, frozen).

### **7.3.1 Containment and Recovery**

#### Large waterbody

Containment of a diesel fuel slick in a large waterbody requires the deployment of mobile floating booms to intercept, control, contain, and concentrate (i.e., increase thickness) the floating oil/fuel. One end of the boom is anchored to shore while the other is towed by a boat and used to circle the diesel fuel slick and return it close to shore for recovery using a skimmer. Reducing the surface area of the slick increases its thickness and thereby improves recovery. Mechanical recovery equipment (i.e., skimmers and oil/water separators) would be mobilized to site if required.

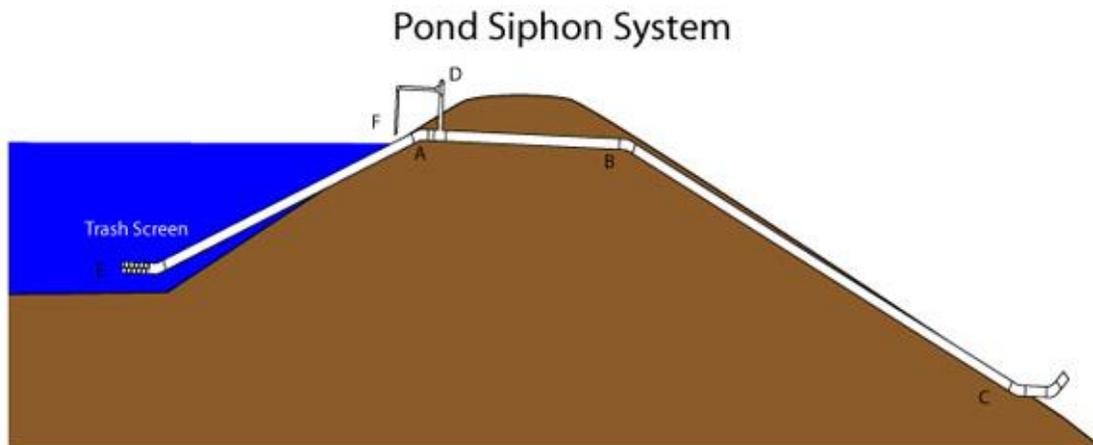
#### Small waterbody

If diesel fuel is spilled in a small lake or pond it may not be possible to deploy booms using a boat. In this case, measures are taken to protect sensitive and accessible shorelines (spills resulting from traffic incidents). The diesel fuel slick can be monitored to determine the direction of migration. In the absence of strong winds the oil will likely flow towards the discharge of the lake. Measures are taken to block and concentrate the oil

slick at the lake discharge using booms where it will subsequently be recovered using a portable skimmer, a vacuum, and/or sorbent materials.

### Small stream

In small slowly-flowing rivers, streams, channels, inlets, or ditches, inverted weirs (i.e., siphon dams) can be used to stop and concentrate moving diesel fuel for collection while allowing water to continue to flow unimpeded. In order to prevent fuel flowing over a barrier or check dam in an emergency situation (i.e., in a remote area), a rudimentary siphon dam can be made by simply inserting a pipe through the dam at its base. Care must be taken to ensure that the water level does not decrease enough to allow fuel to flow through the pipe. This can be attained by raising the exit end of the pipe to the height of the desired water level as in Figure 7.2.



**Figure 7-1. Illustration of siphon dam removing water from below a fuel slick.**



**Figure 7-2. Photo depicting a rudimentary siphon dam.**

In the case of floating diesel fuel flowing towards a culvert (i.e., at a road crossing) a culvert block is used to stop and concentrate moving fuel for collection while allowing water to continue to flow unimpeded. In an emergency, a culvert block can be made by placing boards or a piece of plywood just above and below the surface of the water thereby stopping the uppermost level of water, or floating oil, from going through the culvert. In both cases diesel fuel will then be recovered using a portable skimmer or sorbent materials. In very slow flowing streams, fuel can be contained and recovered as noted above in the small waterbody section.

#### Large stream

In the case of spills in larger rivers, with fast moving currents, diversion booming is used to direct the oil slick ashore for recovery. Single or multiple booms (i.e., cascading) may be used for diversion. Typically, the booms are anchored across the river at an angle. The angle will depend on the current velocity. Choosing a section of a river that is both wider and shallower makes boom deployment easier. Diversion booming may also be used to direct an oil slick away from a sensitive area to be protected. Once fuel has been diverted it can be recovered using a portable skimmer or sorbent materials.

### **7.3.2 Miscible Materials**

Miscible materials are substances that will readily mix with water (i.e., will not float on the surface like oil). Miscible materials that will be onsite in large quantities include glycol and sewage water. Both glycol and sewage, when mixed with water, will readily disperse and mix with the water and thus contaminate the water body. Ensure proper PPE is used if working near a sewage spill as it is considered a biohazard. When working near a glycol spill, ensure that there is plenty of ventilation and that personnel are not breathing vapors (i.e., work up-wind from a spill and ensure proper use of vapor purifying respirators). Glycol is mildly flammable, therefore ensure sources of ignition are removed.

Sewage, depending on the relative amount in comparison to the size of the water body, may create a very high biological oxygen demand (BOD) potentially removing all oxygen from the system and causing a fish kill. With prompt response, a barrier from the top to the bottom of the water column may contain and concentrate large amounts of spilled substance (mainly solids) for removal via pumps.

Glycol (ethylene glycol) dissipates rapidly in water and is a toxin. A concentration of 41,000 mg/L will kill 50% of trout within 96 hours (LC50). Glycol will generally break down in approximately 10 days. There is very little that can be done for cleanup, however, wildlife should be kept from entering the water body (Section 7.7) and any dead fish should be recovered to prevent the scent from attracting animals.

Spills of miscible materials on land can generally be contained similarly to diesel fuel (Section 7.2), however, caution must be taken that these substances do not contaminate groundwater through seepage. Prompt removal of the top layer of soil and proper disposal would potentially avoid contamination.

## **7.4 Spills on Snow and Ice**

Response to spills on snow or ice include the general procedures previously detailed in Section 7.2, including safety, stopping the free flow of product, and reporting. In general,

snow and ice will slow the movement of hydrocarbons. Snow and frozen ground also prevent hydrocarbons from migrating down into soil or at least slow the migration process and will often prevent seepage of fuel into water. The presence of snow may however hide the diesel fuel slick and make it more difficult to follow its progression. Snow is generally a good natural sorbent, as hydrocarbons have a tendency to be soaked up by snow through capillary action. However, the use of snow as absorbent material is to be limited as much as possible.

Following the snow melt, TSMC personnel will re-assess the spill area in order to confirm no soil penetration of spilt material for spills larger than 50 L.

#### **7.4.1 Containment**

When encountering a spill on snow and ice, most of the response procedures for spills on land may be used. The use of dykes (i.e., compacted snow berms lined with plastic sheeting) or trenches (dug in ice) slow the progression of the fuel and also serve as containment to allow recovery of the fuel.

#### **7.4.2 Recovery**

Free-product can be recovered by using a vacuum, a pump, or sorbent materials. Contaminated snow and ice can be scraped up manually or by using heavy equipment, depending on volumes of spilled material and the area covered. The contaminated snow and ice is placed in containers or within lined berms on land. Once enough snow has melted, the oily water is removed from the storage and processed through an oily water treatment system. Any under ice fuel can be recovered by auguring through the ice and using a vacuum pump.

### **7.5 Spills into Wetlands**

Wetlands vary greatly in size and composition. They may be composed of mainly peat with very little surface water (i.e., bog) or may be mainly composed of emergent plants with large amounts of flowing or standing surface water (i.e., fen or marsh). Responses to spills in these environments will therefore generally be a combination of the above noted procedures of spills on land and into water (winter procedures would default to

Spills on Snow and Ice). The response would include the general procedures previously detailed in Section 7.2, including safety, stopping the free flow of product, and reporting.

Spills into a relatively dry wetland (i.e., no standing water) would generally be contained using the methods outlined in Section 7.2.4 using berms and dykes. Any free product could be contained using vacuums or pumps while remaining peat could be excavated or skimmed off using heavy equipment.

Spills into wetlands with flowing water would require the use of booms such as those outlined in Section 7.3.1 and a similar recovery. Spills into wetlands that have standing water may or may not require booms depending on the size of the water body and the magnitude of the spill. A large magnitude spill would likely benefit from booms strung out over both the land and water portions of the wetland. A smaller scale spill may be completely contained within the wetland. In either case recovery would entail pumping/skimming the spill from the water body and excavating the land based portion of the spill area.

## **7.6 Halocarbons and Gaseous Material Releases**

As indicated in Section 7.0, a spill is defined as the discharge of a hazardous product out of its containment and into the environment, which includes hazardous gases. The main source of hazardous gas on site relate to heat exchangers or air conditioning in the plant (halocarbons). Many of the halocarbons associated with heat exchange have varying ozone depletion potential and are considered greenhouse gases. Halocarbons also tend to displace air and therefore add an extra safety factor to the response procedures.

As halocarbon gases tend to displace air (oxygen), immediately evacuate persons from the site or building and contact the Emergency Response Team and Schefferville Fire Department. However, if it is safe to do so (i.e., the release is outdoors) and the release can be immediately contained by closing a valve, proceed to do so with caution. Otherwise, someone trained using a Self-Contained Breathing Apparatus (SCBA) will be required to contain the leak. Following isolation of the leak and containment, ensure all hazardous material (gas) has been removed prior to entering the building or approaching

the site. Ensure proper ventilation, especially in lower lying areas, basements, pits, or trenches. If any liquid is present, ensure it is wiped up with spill pads by someone wearing the appropriate PPE (SCBA, Hazmat suit, rubber gloves). Following cleanup of any liquids, ensure that the area is well ventilated including upper and lower levels if present.

If a fire occurs near a halocarbon storage area or air conditioning unit, extreme caution must be taken as corrosive by-products may be produced including hydrochloric acid or halogenated furans and dioxins.

## **7.7 Wildlife Protection Procedures**

At any point during the spill response, wildlife may be affected by the spill. In response to a spill event, techniques used to prevent wildlife from becoming oiled or contaminated, by preventing animals from entering the contaminated area, will consist of hazing and other deterrents. This can be accomplished using a combination of both audible and visual devices, including but not limited to:

- Pyrotechnics (i.e., shell crackers, screamers, etc.)
- Visual scare tactics (i.e., helicopters, vehicles)
- Broadcast sounds (i.e., audible bird scarer)
- Exclusion (i.e., netting applied in smaller contaminated areas such as settling or evaporation ponds)

These techniques need to be set in place immediately after a spill occurrence so as to minimize impact to wildlife.

The size of the spill and location in relation to sensitive wildlife areas must be assessed at the time of the event to facilitate determination of appropriate deterrence levels. Only workers trained in the safe and proper use of certain hazing equipment will be permitted to haze wildlife. Personal Protective Equipment will be worn by all personnel using equipment, as per manufactures instructions, and at the minimum will include the use of eye and ear protection. Other workers in the vicinity of such devices should also use ear

protection or remain a safe distance away. Hazing through the use of pyrotechnics should not be used too close to dry vegetation or flammable spill materials due to fire hazard.

Hazing should be equal and continuous in all contaminated areas to prevent wildlife from being hazed into an area where they may be in danger. It is also important to ensure that hazing efforts do not cause already contaminated animals to scatter, and that techniques are applied as soon as possible to prevent wildlife from contacting spills.

To prevent habituation, variation of hazing techniques will be used such as changing the location, appearance, and types of hazing, or using a combination of hazing techniques.

Efforts shall be made to collect alive or dead oiled wildlife. In the event of a spill occurring in or around a water body, shorelines shall be inspected for contaminated wildlife to be collected. Emergency Response Teams shall be equipped with dip-nets, large plastic collecting bags for dead wildlife, and cardboard boxes or cloth bags for live oiled wildlife. To ensure alive oiled wildlife be dealt with humanely, capture and handling of wildlife shall only be done by trained and permitted individuals. Gloves shall be worn when handling contaminated wildlife (leather gloves for raptors and mammals, latex/rubber gloves for ducks and small shorebirds). Wildlife will be kept individually within cloth bags or ventilated cardboard boxes labeled with the date and time the animal was found, name of finder, location, and name of species, if known. Wildlife treatment facilities will then be contacted for advice on treatment (see Table 7.1). All contaminated wildlife will be held in a warm quiet place until treatment. The CWS will be consulted to determine the most humane treatment strategy (rehabilitation or euthanization) to be implemented for live oiled wildlife.

For wildlife mortalities each carcass shall be bagged and labeled individually. The date and time animal was found, name of finder, location, and name of species, if known, shall be documented. Canadian Wildlife Services (CWS) shall be consulted and approval obtained prior to disposing of any dead wildlife. Contact information for experts in bird hazing and bird exclusion, oiled bird rehabilitation, and permits needed to haze, salvage, hold and clean, or euthanize birds, are shown in Table 7.1.

**Table 7.1 Emergency Contacts in Case of Spills Affecting Wildlife**

<b>Name</b>	<b>Location</b>	<b>Phone Number</b>	<b>Purpose</b>
Canadian Wildlife Services (CWS)	St. John's, NL Gatineau, QC	1-709-772-2083 1-819-997-2800	<ul style="list-style-type: none"> <li>• Knowing and providing information on the migratory bird resource and species at risk (under CWS jurisdiction) in the area of a spill (this includes damage assessment and restoration planning after the event)</li> <li>• Minimizing the damage to birds by deterring unoiled birds from becoming oiled</li> <li>• Ensuring the humane treatment of captured migratory birds and species at risk by determining the appropriate response and treatment strategies which may include euthanization or cleaning and rehabilitation.</li> </ul>
Cobequid Wildlife Rehabilitation Centre	Brookfield, NS	1-902-893-0253	Provide veterinary care and rehabilitation for wildlife
Le Nichoir	Hudson, QC	1-450-458-2809	Avian rehabilitation specialists
Union Québécoise de réhabilitation des oiseaux de proies	St. Hyacinth, QC	1-514-345-8521 Ext. 8545	Rehabilitation specialists for birds of prey (Veterinary School)
Wildlife QC		1-866-248-6936	Provincial rehabilitation for wildlife
Canadian Coast Guard		1-800-563-9084	The Coast Guard Emergency Response will direct the caller to the appropriate management team.
International Bird Rescue	International	1-888-447-7143	Wildlife rehabilitation specialists, can manage all aspects of wildlife response

## **7.8 Emergency Contacts**

In case of an emergency requiring off-site assistance, key contacts from Schefferville are listed in Table 7.2. Note that the environment and permitting department or security will generally be notified prior to contacting off-site services and will therefore be contacted by either the environment and permitting department or security.

**Table 7.2 Offsite Key Contacts in Case of Emergency**

Ambulance	(418) 585-2055
Police	(418) 585-2626 24 hours - (418) 310-4141
Fire	(418) 585-2463
Clinic	Day - (418) 585-2645 Night - (418) 585-2646
Environmental Emergency Service (QC)	1 (866) 694-5454
RCMP (NL province wide)	1 (800) 709-7267

## **7.9 Disposal of Spilled Material**

Steel drums or other appropriate containers as approved they the environment and permitting department are used to contain and transport contaminated soil or materials for treatment. Temporary storage of contaminated materials can be within lined berms for a period of no more than 30 days, and any run-off from the soils must be recovered, analyzed and decontaminated if necessary. Depending on the nature of the spilled contaminant (hydrocarbons), used sorbent material can be burned in an incinerator or shipped to a licensed facility for treatment and disposal. Soils contaminated with diesel fuels can be transported to the onsite land farm for onsite bioremediation.

## **7.10 Spills Involving Fires**

Collisions or traffic accidents resulting in fuel spills can be the source of fires. Although diesel fuel is not extremely flammable, fires are nevertheless a possibility and are included in the emergency response plan.

Small fires that are away from the source of fuel can be extinguished relatively easily using an appropriately sized fire extinguisher, however larger fires or fires that are near the source of the spill (i.e., leaking tank) have a much greater potential danger associated with them. Unless personnel are trained in the use of fire extinguishing equipment and the fire is small and away from the source of fuel, the onsite fire crew should be notified immediately via radio and/or telephone (contact dispatch) and informed of the situation. Personnel should evacuate to a safe distance. Large fires may require the evacuation of all personnel from a large radius surrounding the immediate area.

In the case of a small fire, personnel may attempt to extinguish the fire with a fire extinguisher provided it is safe to do so and the employee is adequately trained and knowledgeable in the types of fire extinguishers for different types of fire. When approaching a fire, always approach from upwind or at a slight angle and away from the fuel source. Pull the pin on the fire extinguisher, aim the nozzle at the base of the flame, squeeze the handle/trigger, and sweep from side to side until the fire is extinguished. Once the fire is extinguished and it is deemed safe to do so, proceed to the spill response procedures outlined in Section 7.2.

## **8.0 POTENTIAL SPILL ANALYSIS**

To prepare for emergency spill response, potential spill analysis was conducted on various worst-case scenarios. The exercise serves to identify potential risk areas, as well as to determine the fate of spilled products and their environmental effects. Note that spill reporting to regulators (by Tata Corporate) is not mentioned for the purpose of this exercise and is covered separately in Section 9. Similarly, these scenarios do not include situations where fire occurs. Fires are covered under Section 7.10

Various types of materials are susceptible to cause environmental, health and safety concerns should a spill occur while being transported, stored and handled: fuel, untreated sewage, coagulants, glycol, and halocarbons (Freon). These materials are handled/used

daily in sufficiently large quantities to warrant the evaluation of potential spill scenarios. All other hazardous materials, chemicals or wastes are handled/used/stored in smaller quantities and packaged/transported in small containers that limit the magnitude of the spills that could potentially occur.

## **8.1 Fuel Spills**

For locations of the fuel farm and temporary fuel depots at each of the Project sites, see Figure 1-1. For the expected max quantities of fuel stored at each location during construction and operation, see Table 8.1.

Fuel tanks are designed to have bermed spill containment with capacity equal to the volume of the largest tank plus 10% of the volume of the remaining tanks or 110% of the volume of the largest tank, whichever is greater. In calculating the volume, the footprint of the smaller tanks is subtracted. Bermed areas will be liquid tight to a permeability of no less than 25 L/m<sup>2</sup>/day.

The above basis is consistent with the document *Storage and Handling of Gasoline and Associated Products Regulations, 2003*, CNLR 58/03. The lining in the bermed area at the fuel farm is an impervious membrane. The main refueling station is equipped with a lined and bermed area to contain minor spills or leaks during refueling. The liner is protected by sand bedding. Vehicles and mobile equipment drive onto this bedding for refueling. All fuel transfer is done by pumps with auto shut off valves (similar to gas station pump handles).

All fuel storage areas are equipped with spill kits for emergency response and a current Spill Response Plan will be maintained that identifies spill kit locations and response plans. The spill kits will contain the appropriate type, size and quantity of equipment for the volume/type of product present in the storage location as well as the environment likely to be affected by a spill (i.e., ground, river, lake).

For each method of fuel storage and transfer, specific procedures related to fuel storage and transfer will be developed, and proper containment and emergency response equipment will be provided to meet or exceed regulatory requirements (Section 7.1).

Heavy equipment will generally be refueled via a mobile fueling station (i.e., fuel truck) at various locations throughout the mine site. All fuel trucks will be equipped with auto shut off valves and will be required to carry an appropriately sized spill kit. In addition, fuel trucks will follow the rules set out in the Federal ‘Gasoline and Gasoline Dispensing Flow Rate Regulations’ if applicable. A spill pan will be used when refueling to prevent a discharge in the event of a splashback or overfilled tank.

**Table 8.1 Location and Volume of Fuel**

<b>Location</b>	<b>Spill kit location</b>	<b>Container Capacity</b>	<b>Number of Containers</b>
Fuel Farm		1,700,000	X 2
		75,000	X 3
		50,000	X 2
		200,000	X 1
<b>Subtotal for storage area</b>		<b>3,925,000</b>	<b>8</b>
Other Fuel Storage Areas			
Gasoline			

### **8.1.1 Potential Fuel Spill Scenario 1 – Fuel Farm**

The Fuel Farm is located near the sedimentation pond and the sinter fines stockpile in an impermeable secondary containment structure (lined and bermed containment area). The construction will be in compliance with building codes and best practices for tank farm facilities. The low point of the containment area will be fitted with a pumping system for capture/disposal of runoff in the secondary containment area. The same pumping system is used to recover large spills, should they occur. For the capacity of the tank farms at each location, along with the finished capacity of the secondary containment see Table 8.1.

A worst case scenario would involve a complete rupture of the largest capacity tank, bypassing the berm, and flowing into the sedimentation pond. Fuel recovery would require immediate response in order to avoid fuel flowing out of the sedimentation pond into fish bearing waters. This would require 1) containing the spilled fuel in the sedimentation pond, 2) preventing any remaining fuel on land from entering the sedimentation pond, 3) removing any fuel from the water, and 4) removing any fuel and contaminated soil.

With such a large fuel spill, phoning/radioing for immediate assistance would be imperative. With assistance, a few main steps would need to be taken simultaneously starting with stopping the flow of fuel. With a full rupture of the tank, it would be unlikely that the fuel could be stopped from exiting the tank, however, it may be possible to transfer fuel from the ruptured tank into other tanks until the fuel level is below the leak/rupture. Similarly, repair of the berm would ensure that fuel which had already exited the tank would remain in the lined and bermed area. This could be as simple as placing a few booms where the berm has been ruptured, or may require a few loads of gravel and repair using heavy equipment. The third time sensitive step would include containing the fuel that has spilled into the sedimentation pond prior to it flowing into fish bearing waters. This would require immediately blocking the exit culverts and/or having a floating boom available for rapid deployment near the outflow. Blocking the exit culverts would require the cessation of pumping water into the sedimentation pond, and therefore stopping the dewatering process. Fuel could then be recovered as outlined in Section 7.3 – Spills into water. Depending on the amount of fuel that entered the sedimentation pond, containing the spill in the water may be feasible simply by deploying a few floating booms, and therefore not interrupting the dewatering process.

Preventing any remaining fuel from entering the waterbody could be attained by methods outlined in Section 7.2 – Spills on land, and 7.4 – Spills on snow and ice, utilizing such methods as placing small check dams, berms, and dykes to redirect the flow. Fuel recovery and cleanup would be achieved as noted in the above mentioned sections.

Although a complete rupture of the largest fuel tank would be catastrophic, it is also highly unlikely. The most likely source of spills in the fuel farm area would occur during refuelling or refilling of tanks. These operations will be carried out by trained personnel who stop the fuel transfer operations whenever a leak is detected. Any fuel spilling in these instances would be contained in the lined and bermed area.

### **8.1.2 Potential Fuel Spill Scenario 2 – Train Derailment**

There is expected to be a fuel shipment arriving at site by rail on a weekly basis during the summer months and every two days during the winter months. With the relatively high number of fuel wagons arriving by rail, a train derailment spilling 12 fuel wagons is a worst case scenario.

If uninjured, the driver would act as first responder and immediately call for assistance and report the spill (conductor would have a dash mounted radio – reporting can be done as noted in Section 7.2.3 – informing of the location, substance spilled, amount spilled, if the spill is on land or water, presence of fire, and if the spill is contained). The radio dispatcher would initiate the Emergency Response Team. Depending on the distance from site and proximity to roads, personnel and equipment may have to be brought in by air or rail. If by chance the derailment was not near a water body, the conductor and Emergency Response Team could potentially create a dam in the railway ditching using any available materials (i.e., downed trees, gravel, booms, snow) and line the ditch/dam with plastic sheeting to prevent seepage. Vacuums, pumps, and heavy equipment would be brought in by rail for cleanup.

If the spill occurred near a waterbody, fuel would likely flow down the ditching into the water. The first responders could attempt to stop the flow of fuel as noted above and subsequently boom the watercourse or lake as noted in Section 7.3.

### **8.1.3 Potential Fuel Spill Scenario 3 – Pipeline**

Above ground fuel pipelines will transport fuel from the fuel farm tanks to various locations on site. A complete rupture of a major pipeline (e.g., vehicular collision) would present a worst case scenario. Of utmost importance in such a case is to immediately close any valves controlling the fuel up-flow of the rupture. If a valve is nearby, it may be

possible to attempt this personally or may require radioing/phoning dispatch for it to be turned off remotely. It may be necessary to close the valves on either side of the rupture in order to prevent a backflow of fuel. Once the flow has stopped, fuel is likely to continue leaking out of the ruptured section as the fuel in the pipeline continues to drain. Containment and recovery can be attained as noted in Section 7.2. It is imperative that fuel be ditched or dyked away from any sources of water.

#### **8.1.4 Potential Fuel Spill Scenario 4 – Fuel Truck**

Fuel for heavy equipment will be transported by fuel truck daily (two fuel trucks running 24 hours/day) along the Goodwood Road. Additionally, fuel will be transported from Shefferville to site by fuel truck while awaiting completion of the rail line. A traffic accident resulting in a rupture of the fuel truck would present a worst case scenario.

If uninjured, the driver would act as first responder and immediately call for assistance and report the spill (driver will likely have a dash mounted radio – reporting can be done as noted in Section 7.2.3). The radio dispatcher should initiate the Emergency Response Team and any heavy equipment near the spill. If a small fire has occurred, the driver may attempt to extinguish the fire with a fire extinguisher and or attempt to stop the flow of fuel. If the fire is large or near the fuel tank, all efforts must be made to evacuate the area.

If no fire is present, the driver will be sufficiently trained in order to initiate the ERP using the spill kit kept in the truck. Large volumes of fuel should be diverted away from any waterbodies by trenching or building small dykes with the tools on hand (i.e., shovel, pick, nearby loader). If the spill kit is so equipped, placing booms on the ground or across small waterways (as noted in Section 7.3) may prevent further contamination until the Emergency Response Team can arrive. Emergency personnel may be required to boom the exit point of the river if containment is not possible at the spill site. If possible, the driver should maintain communication with the dispatcher and Emergency Response Team to update the situation.

## **8.2 Explosives Transport and Storage**

Explosives will be handled through an independent company. Only small amounts of 'ready-made', or prepared explosives will be present on site at any given time. At no time will there be large stockpiles of ammonium nitrate on site, and therefore it is highly unlikely a spill would occur.

### **8.2.1 Potential Explosives Spill Scenario 1**

In the event of a vehicular accident occurring while transporting explosives, the explosives contracting company and the Emergency Response Team would be notified immediately in order to evacuate the surrounding area and put in place the emergency response plan. On-site emergency medical services would be contacted to respond or put on standby, depending on the severity of the explosion. It is highly likely that in the case of an explosion, firefighting services would be required from the Emergency Response Team. After the risk to human life and property has passed, a qualified professional would be required to 'clear the area' (i.e., indicate that there is no longer a risk of explosion) prior to clean up. With fire crew on standby, the Emergency Response Team would commence with cleanup as appropriate for ammonium nitrate and/or fuel spilled on site.

## **8.3 Untreated Sewage Discharge**

Wastewater and sewage will be collected at two separate locations, including the camp and the processing plant. Sewage water will be piped to one of the septic systems prior to being released into the environment while solids will go by truck as necessary (Note: the Federal Wastewater Systems Effluent Regulations do not apply to QC or NL above the 54<sup>th</sup> parallel, however, Québec legislation continues to apply, with the exception that small septic, under 20 persons, falls under municipal legislation above the 55<sup>th</sup> parallel. Large septic remains under Provincial QC legislation, small septic of under 20 persons defaults to municipal legislation).

### **8.3.1 Potential Sewage Spill Scenario 1**

A spill from the holding facility/treatment plant due to pipe or mechanical failure could potentially release a large amount of untreated sewage. Operators from the treatment plant would be first responders and, assuming it is safe to do so, attempt to stop and contain the spill using appropriate measures including closing valves above and below the rupture. Dykes and berms can be put in place in order to contain the spill and prevent any material from flowing into a waterbody, such as described for fuel spills in Section 7.2. Clean up can be undertaken using a vacuum truck or loader. Impacted soils would be excavated and disposed of properly while liquid material would be pumped and returned to the treatment facility (assuming the reason for the release has been corrected). The affected area should be roped off to prevent personnel or public from entering the area.

Any untreated sewage entering a waterbody could partially be contained with a floating boom and skimmed via vacuum truck, however, this method would only function with the floating portion prior to mixing (see Section 7.3.2). Even small amounts of untreated sewage would likely result in *E.coli* contamination. Extra water treatment may be required if the spill is in a source of potable water. An increased biological oxygen demand could potentially arise from a large spill and consume the majority of oxygen in the water. Fish kills could result in slow flowing streams or lakes and ponds if increased oxygen is not input into the water body. This can be done using air bubblers or pumping oxygen directly into the deep sections of the waterbody.

### **8.3.2 Potential Sewage Spill Scenario 2**

A spill from the sewage truck resulting from a traffic accident could potentially release a large amount of untreated solids directly into the environment. Operators from the sewage truck would be first responders and, assuming it is safe to do so, attempt to stop and contain the spill using appropriate measures. Dykes and berms can be put in place in order to contain the spill and prevent any material from flowing into a waterbody, such as described for fuel spills in section 7.2 – spills on land. Clean up can be undertaken as noted in Section 8.3.1.

## **8.4 Glycol Spills**

Glycol will be used in sufficiently large amount onsite that could trigger the need for an emergency response in the event of a spill. As noted in section 7.3.2, glycol readily mixes with water and will not float like fuel. It is imperative that glycol be contained prior to entering a waterbody. Glycol should be cleaned up using vacuums, pumps, and heavy equipment as soon as possible to avoid groundwater contamination. Contaminated soil should be excavated and disposed of properly. Due to the toxic nature of glycol, a spill should never be left unattended where wildlife can come into contact with the product. Due to the sweet taste of glycol, wildlife will readily drink or eat glycol contaminated water and soil causing death.

### **8.4.1 Potential Glycol Spill Scenario 1**

Above ground pipelines will transport glycol to various locations on site. A complete rupture of a pipeline (e.g., vehicular collision or pipe failure) would present a worst case scenario. Of utmost importance in such a case is to immediately close any valves controlling the flow of glycol. If a valve is nearby, it may be possible to attempt this personally or it may be necessary to radio/phone dispatch for it to be turned off remotely. It may be necessary to close the valves on either side of the rupture in order to prevent a backflow. Once the flow has stopped, glycol is likely to continue leaking out of the ruptured section as the pipeline continues to drain. Containment and recovery can be attained as noted in Section 7.2. It is imperative that all glycol be ditched or dyked away from any sources of water and be cleaned up as soon as possible.

## **9.0 REPORTING REQUIREMENTS**

Reporting of spilled or released hazardous materials is integral to the ERP. The spill report shall be sent to different jurisdictions depending on the location and amount of spilled material. **Spill reporting will be done by the environment and permitting department and Tata Corporate.**

- Any and all hazardous material spilled or released, regardless of size or location, must be reported to the environment and permitting department who will report to Tata corporate. The corporate office notifies provincial level officials of all spills verbally or via e-mail as soon as possible.
- In Newfoundland and Labrador, any hazardous material spilled or released into water or spills over 70 L on land must be reported verbally to the Provincial Government and the Canadian Coast Guard as soon as possible and a written report shall be submitted by Tata corporate shortly thereafter.
- In Québec, any and all hazardous material spilled or released into water or on land must be reported to the Provincial Government (of Québec) as soon as possible. Spills into water or over 70 L on land must also be reported to the Canadian Coast Guard.
- Spills or releases of hazardous material spilled in Québec that are reported to the Provincial Government should also be reported to the Kativik Regional Government.

After the initial field emergency response to the spill event, spills are reported to the 24-hour Spill Report Line:

**24-Hour Spill Report Line (Federal)**

**Tel. (709) 772-2083 in Newfoundland and Labrador**

**1-800-563-9089**

Fax. (902) 426-7924

**or**

**(514) 283-2333 in Québec**

**1-866-283-2333**

Fax. (514) 496-2087

Failure to report a spill can lead to fines. After contacting the Federal 24-hour Report Line, the affected provincial government(s) shall be promptly notified along with the Kativik Regional Government (if spill occurs in Québec). It is the responsibility of the

environment and permitting department and Tata Corporate to prepare the proper reports and transmit them to the appropriate regulatory authorities. Note that both the federal and provincial governments must be contacted.

**Table 9.1 Contact List for Reporting Spills Occurring in Newfoundland and Labrador**

Department	Person	Telephone	Fax	Email
<b>Newfound and Labrador</b>				
Federal NL	-	(709) 772-2083	(902) 426-7924	
Provincial NL	Troy Duffy	(709) 643-6114		duffyt@gov.nl.ca
Env. Protection Officer		(709) 896-5473		
Service NL	Ken Russell	(709) 896-5471		krussell@gov.nl.ca

**Table 9.2 Contact List for Reporting Spills Occurring in Québec**

Department	Person	Telephone	Fax	Email
<b>Québec</b>				
Federal QC	-	(514) 283-2333	(514) 496-2087	
Provincial QC	-	1-888-694-5454 1-866-694-5454		
Kativik Regional Government	Monica Nashak	(819) 964-2961 Ext. 2276		mnashak@krg.ca

The verbal notification must include the following:

- The reporting person's name and telephone number
- The name of the person who owns or has the charge, management, or control of the substance immediately before the environmental emergency
- The date and time of the release
- The location of the release
- The name and CAS registry number of the substance released

- The means of containment (from which the substance was released) and a description of its condition
- The number of injuries or deaths resulting from the environmental emergency
- The surrounding area/environment affected and potential impact of the release (mobility of release and weather or geographic conditions at the site)
- A brief description of the circumstances leading to the release
- The cause of the release (if known)
- Details on the actions taken or further actions contemplated (to contain, recover, clean up, and dispose of the substance involved)
- The names of agencies notified or on-scene
- Other pertinent information.

When an environmental emergency occurs in respect of a substance set out in Column 1 of the Schedule 1 (Environment Canada’s Environmental Emergency Regulations – See appendix A for list), a written report is required to be sent to the Federal Regional Director of the Environmental Enforcement Division of the Enforcement Branch or the Department of the Environment in the Region where the environmental emergency occurs (see Table 9.3 for contact information).

**Table 9.3 Contact List for Reporting Spills by written report**

<b>Newfoundland and Labrador</b>	<b>Québec</b>
Regional Director, Environmental Enforcement Directorate, Atlantic Region Environment Canada Queen Square 45 Alderney Drive, Dartmouth NS B2Y 2N6 Fax: (902) 426-7924	Regional Director, Environmental Enforcement Directorate, Québec Region Environment Canada 105 McGill St. (3 <sup>rd</sup> Floor) Montréal QC H2Y 2E7 Fax: (514) 496-2087

The written report must include the following:

- The name, civic address, and telephone number of the person who owns or has the charge, management, or control of the substance released

- The date, time, and location of the substance release
- The number and CAS registry number of the substance released,
- The quantity of the substance released, or, if the quantity cannot be determined, an estimate of the quantity
- The identification of the container from which the substance was released and a description of its condition
- The location of the release and description of the potential negative effects on the environment or on human health or life
- A description of the circumstances and of the cause of the release (if known) and of the measures taken to mitigate any negative effects on the environment or on human life or health
- The identification of all persons and agencies notified as a result of the release
- All measures taken or planned to be taken to prevent similar releases

## **10.0 POST CLEAN-UP**

Following reporting and clean-up, it is often recommended that a third party be engaged to perform confirmatory sampling to ensure that clean-up is completed prior to back filling and site restoration.



# DOME FIRE EMERGENCY RESPONSE PLAN

**Call:** "Emergency! Emergency! Emergency!" OR Three Blasts from Air Horn  
**Note:** Emergencies must be communicated to the entire site via radio

**STOP!**  
Cease work  
site wide and  
proceed to  
Muster point

Area Supervisor to provide nature of fire  
and information to Security via radio or  
418-585-2128 ext. 399

1

Security contacts Fire Brigade through two way radio,  
until pagers are established and advises of location of  
the fire

Water truck to respond to location and put out fire

If the fire truck is not available or more assistance is required: Security  
to contact local Fire Department: 418-585-2463 or Kawawa Fire  
Department: 418-585-2678

2

Area Supervisor to maintain  
control of the scene

Area Supervisor to assign an  
employee to meet and escort  
emergency response vehicle(s)

Area Supervisor to contact all  
appropriate Safety and  
Management personnel as required



PROJECT: Feasibility Study Howse Deposit Project  
 CLIENT: Tata Steel Minerals Canada  
 PROJECT: 2014-049

# MECHANICAL EQUIPMENT LIST

## HOWSE DEPOSIT DSO PLANT

Revision	Purpose of Issue	Date	Prepared by	Checked by	Approved by
A	Issued for final report	17/09/2015	E. Pengel, P.Eng.	W. Shadeed, ing.	André Boilard, ing.

Rev. No.	Equipment Number	Area	Equip. Code	Seq. #	Pkg Number	Equipment Name	Qty	Description / Model / Size	Supplier	Motor Status	Installed kW	In Operation kW	Emergency	Motor Type	Weight (kg)	Drawing No.	Remarks
A	100-APF-01	100	APF	01	4280	Material feeder	1	Universal D8 Tractor Chain Apron Feeder 60" Wide X 67' Long FD8-60C-67.0-	McLanahan	Operating	117	117				A1-2014-049-0201-F	Twin 75HP drives + 7.5 HP for dribble conveyor and variable speed incl
A	100-GRZ-01	100	GRZ	01	4280	Hydraulic grizzly	1	Hydraulic unit grizzly on top of material feeder	Met-Chem Database	Standby	22.4	0.0				A1-2014-049-0201-F	
A	100-CHU-01	100	CHU	01	4226	Discharge chute	1	Material feeder discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-WOF-01	100	WOF	01	4188	Wobbler Feeder	1	Heavy Duty Wobbler Feeder 60"WIDE X 16 BAR X 11 1/2" PITCH	McLanahan	Operating	22.4	22.4				A1-2014-049-0201-F	Variable speed motor included, 30 HP at peak capacity
A	100-CHU-05	100	CHU	05	4226	Discharge chute	1	Wobbler feeder undersize chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-06	100	CHU	06	4226	Diverter chute	1	Grizzly undersize diverter chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-07	100	CHU	07	4226	Discharge chute	1	Diverter chute discharge chute to Drying area	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-02	100	CHU	02	4226	Feed Chute	1	Wobbler feeder oversize chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-JCR-01	100	JCR	01	4188	Primary Jaw Crusher	1	Metso Jaw Crusher Nordberg C120	Metso	Operating	149	149				A1-2014-049-0201-F	
A	100-CHU-03	100	CHU	03	4226	Discharge chute	1	Jaw crusher discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CVO-01	100	CVO	01	4370	Sacrificial conveyor	1	1200mm W x 12m L x 2m vertical lift	B.I.D. Canada Ltd	Operating	19	19				A1-2014-049-0201-F	
A	100-BSC-01	100	BSC	01	4441	Belt scale	1	Sacrificial conveyor belt scale	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	110 V connection required
A	100-CHU-04	100	CHU	04	4370	Discharge chute	1	Sacrificial conveyor discharge chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CVO-02	100	CVO	02	4370	Cone crushers feed conveyor	1	1200mm W x 61m L x 14m vertical lift	B.I.D. Canada Ltd	Operating	185	185				A1-2014-049-0201-F	
A	100-MON-01	100	MON	01	4156	Magnet monorail	1	Brawny Manual Trolley / 8000 lbs capacity	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-SMG-01	100	SMG	01	4615	Stationary tramp magnet	1	Manual Suspended Magnetic Cleaning	Met-Chem Database	Operating	7.5	7.5				A1-2014-049-0201-F	
A	100-CHU-08	100	CHU	08	4226	Splitter chute	1	Cone crushers screens feed splitter chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-VIS-01	100	VIS	01	4188	Cone crusher vibrating screen #1	1	Double Deck Screen 6.1m L x 3.6m W, top deck 38mm, bottom deck 15mm o	Metso	Operating	55.9	55.9				A1-2014-049-0201-F	
A	100-VIS-02	100	VIS	02	4188	Cone crusher vibrating screen #2	1	Double Deck Screen 6.1m L x 3.6m W, top deck 38mm, bottom deck 15mm o	Metso	Operating	55.9	55.9				A1-2014-049-0201-F	
A	100-CHU-18	100	CHU	18	4226	U/S Chute	1	Screen #1 sinter fines discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-26	100	CHU	26	4226	U/S Chute	1	Screen #2 sinter fines discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-16	100	CHU	16	4226	O/S Chute	1	Screen #1 O/S chute (top deck)	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-24	100	CHU	24	4226	O/S Chute	1	Screen #2 O/S chute (top deck)	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CVO-06	100	CVO	06	4370	Secondary cone crusher #1 feed transfer conveyor	1	1200mm W x 12.5m L x 0m vertical lift	B.I.D. Canada Ltd	Operating	11	11				A1-2014-049-0201-F	
A	100-CHU-19	100	CHU	19	4370	Discharge chute	1	Secondary cone crusher #1 feed conveyor discharge chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CVO-08	100	CVO	08	4370	Secondary cone crusher #2 feed transfer conveyor	1	1200mm W x 8.5m L x 0m vertical lift	B.I.D. Canada Ltd	Operating	8	8				A1-2014-049-0201-F	
A	100-CHU-27	100	CHU	27	4370	Discharge chute	1	Secondary cone crusher #2 feed conveyor discharge chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CCR-01	100	CCR	01	4188	Secondary cone crusher #1	1	Metso HP Series Cone Crusher HP5	Metso	Operating	375	375				A1-2014-049-0201-F	NO VFD (VFD not required)
A	100-HPP-01	100	HPP	01	4188	Secondary crusher #1 hydraulic power pack unit	1	HP5 Hydraulic Power Unit (powering all the hydraulic functions)	Metso	Operating	22.4	22.4				A1-2014-049-0201-F	
A	100-LOU-01	100	LOU	01	4188	Secondary crusher #1 Oil Lubrication System	1	Lubrication system for HP5 Secondary Cone Crusher	Metso	Operating	54.0	54.0				A1-2014-049-0201-F	1x15kW oil pump + 3x3kW oil heaters + 2x15kW air fan coolers
A	100-CCR-02	100	CCR	02	4188	Secondary cone crusher #2	1	Metso HP Series Cone Crusher HP5	Metso	Operating	375	375				A1-2014-049-0201-F	NO VFD (VFD not required)
A	100-HPP-02	100	HPP	02	4188	Secondary crusher #2 hydraulic power pack unit	1	HP5 Hydraulic Power Unit (powering all the hydraulic functions)	Metso	Operating	22.4	22.4				A1-2014-049-0201-F	
A	100-LOU-02	100	LOU	02	4188	Secondary crusher #2 Oil Lubrication System	1	Lubrication system for HP5 Secondary Cone Crusher	Metso	Operating	54.0	54.0				A1-2014-049-0201-F	1x15kW oil pump + 3x3kW oil heaters + 2x15kW air fan coolers
A	100-CHU-21	100	CHU	21	4226	Discharge chute	1	Secondary cone crusher #1 discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-29	100	CHU	29	4226	Discharge chute	1	Secondary cone crusher #2 discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CVO-10	100	CVO	10	4370	Cone crusher #1 discharge conveyor	1	900mm W x 40m L x 7m vertical lift	B.I.D. Canada Ltd	Operating	45	45				A1-2014-049-0201-F	
A	100-CVO-11	100	CVO	11	4370	Cone crusher #2 discharge conveyor	1	900mm W x 35m L x 8m vertical lift	B.I.D. Canada Ltd	Operating	45	45				A1-2014-049-0201-F	
A	100-CHU-30	100	CHU	30	4226	Feed chute	1	Cone crusher #1 discharge conveyor feed chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-31	100	CHU	31	4226	Feed chute	1	Cone crusher #2 discharge conveyor feed chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-BSC-03	100	BSC	03	4441	Belt scale	1	Cone crushers feed conveyor belt scale	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	110 V connection required
A	100-CVO-07	100	CVO	07	4370	Screen #1 U/S conveyor	1	900mm W x 5m L x 0m vertical lift	B.I.D. Canada Ltd	Operating	15	15				A1-2014-049-0201-F	
A	100-CVO-09	100	CVO	09	4370	Screen #2 U/S conveyor	1	900mm W x 5m L x 0m vertical lift	B.I.D. Canada Ltd	Operating	15	15				A1-2014-049-0201-F	
A	100-CHU-15	100	CHU	15	4370	Discharge chute	1	Screen #1 U/S conveyor discharge chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CHU-23	100	CHU	23	4370	Discharge chute	1	Screen #2 U/S conveyor discharge chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CVO-12	100	CVO	12	4370	Sinter fines transfer conveyor	1	900mm W x 29m L x 1m vertical lift	B.I.D. Canada Ltd	Operating	30	30				A1-2014-049-0201-F	
A	100-OSA-01	100	OSA	01	4573	Online stream moisture analyzer	1	Online stream microwave moisture analyzer on final product	Scantech International	Operating	3.7	3.7				A1-2014-049-0201-F	
A	100-BSC-04	100	BSC	04	4441	Belt scale	1	Sinter fines transfer conveyor belt scale	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	110 V connection required
A	100-CHU-33	100	CHU	33	4370	Discharge chute	1	Sinter fines transfer conveyor discharge chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-CVO-13	100	CVO	13	4391	Stockpile tripper conveyor	1	900mm W x 168m conveying length x 13m total vertical lift	Met-Chem Database	Operating	185	185				A1-2014-049-0201-F	
A	150-CVO-04	150	CVO	04	4370	Undersize transfer conveyor #1	1	900mm W x 13m L x 0m vertical lift	B.I.D. Canada Ltd	Operating	11	11				A1-2014-049-0202-F	
A	150-CHU-02	150	CHU	02	4226	Discharge chute	1	Undersize transfer conveyor #1 discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0202-F	
A	150-CVO-01	150	CVO	01	4370	Undersize transfer conveyor #2	1	900mm W x 42m L x 9m vertical lift	B.I.D. Canada Ltd	Operating	55	55				A1-2014-049-0202-F	
A	150-CHU-01	150	CHU	01	4226	Splitter chute	1	Transfer conveyor splitter discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0202-F	
A	150-CVO-02	150	CVO	02	4370	Dryer #1 feed conveyor	1	900mm W x 10m L x 0m vertical lift	B.I.D. Canada Ltd	Operating	7.5	7.5				A1-2014-049-0202-F	
A	150-BSC-01	150	BSC	01	4441	Belt scale	1	Dryer #1 feed conveyor belt scale	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0202-F	110 V connection required
A	150-CHU-10	150	CHU	10	4370	Dryer #1 feed chute	1	Dryer #1 feed chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0202-F	
A	150-BUR-01	150	BUR	01	4212	Dryer #1 burner	1	Diesel fuel burner rated at maximum capacity of 166 GJ/hour	Metso	Operating	0	0				A1-2014-049-0202-F	
A	150-AHE-01	150	AHE	01	4212	Air heater	1	Air heater	Metso	Operating	5	5				A1-2014-049-0202-F	
A	150-FAN-01	150	FAN	01	4212	Dryer #1 combustion air fan	1	Dryer combustion air fan	Metso	Operating	125	125				A1-2014-049-0202-F	
A	150-FAN-05	150	FAN	05	4212	Dryer #1 dilution air fan	1	Dryer dilution air fan	Metso	Operating	50	50.0				A1-2014-049-0202-F	
A	150-DRY-01	150	DRY	01	4212	Rotary dryer #1	1	4.3m diameter x 26m long type rotary drum dryer	Metso	Operating	750	750				A1-2014-049-0202-F	VFD by electrical
A	150-CHU-11	150	CHU	11	4226	Dryer #1 Discharge chute	1	Dryer discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0202-F	
A	150-OSA-01	150	OSA	01	4573	Online stream moisture analyzer	1	Online stream microwave moisture analyzer on dryer #1 discharge	Scantech International	Operating	3.7	3.7				A1-2014-049-0202-F	
A	150-DUC-01	150	DUC	01	4212	Dryer #1 dust collector	1	Multi-module pulse jet dust collector with carbon steel construction	Metso	No motor	0	0				A1-2014-049-0202-F	
A	150-FAN-02	150	FAN	02	4212	Exhaust fan #1	1	Dust collector fan	Metso	Operating	300	300				A1-2014-049-0202-F	
A	150-SCC-01	150	SCC	01	4212	Screw conveyor #1	1	Orthman Screw Conveyor	Metso	Operating	10	10				A1-2014-049-0202-F	
A	150-ROA-01	150	ROA	01	4212	Rotary valve #1	1	Meyer 12" x 12" HDX Rotary Air Lock (rotating valve)	Metso	Operating	10	10				A1-2014-049-0202-F	



PROJECT: Feasibility Study Howse Deposit Project  
 CLIENT: Tata Steel Minerals Canada  
 PROJECT: 2014-049

# MECHANICAL EQUIPMENT LIST

## HOWSE DEPOSIT DSO PLANT

Revision	Purpose of Issue	Date	Prepared by	Checked by	Approved by
A	Issued for final report	17/09/2015	E. Pengel, P.Eng.	W. Shadeed, ing.	André Boilard, ing.

Rev. No.	Equipment Number	Area	Equip. Code	Seq. #	Pkg Number	Equipment Name	Qty	Description / Model / Size	Supplier	Motor Status	Installed kW	In Operation kW	Emergency	Motor Type	Weight (kg)	Drawing No.	Remarks
A	150-CHU-12	150	CHU	12	4226	Discharge chute	1	Dryer #1 dust collector discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	150-CVO-03	150	CVO	03	4370	Dryer #2 feed conveyor	1	900mm W x 10m L x 0m vertical lift	B.I.D. Canada Ltd	Operating	7.5	7.5				A1-2014-049-0202-F	
A	150-BSC-02	150	BSC	02	4441	Belt scale	1	Dryer #2 feed conveyor belt scale	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0202-F	110 V connection required
A	150-CHU-20	150	CHU	20	4370	Dryer #2 feed chute	1	Dryer #2 feed chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0202-F	
A	150-BUR-02	150	BUR	02	4212	Dryer #2 burner	1	Diesel fuel burner rated at maximum capacity of 1166 GJ/hour	Metso	Operating	0	0				A1-2014-049-0202-F	
A	150-AHE-02	150	AHE	02	4212	Air heater	1	Air heater	Metso	Operating	5	5				A1-2014-049-0202-F	
A	150-FAN-03	150	FAN	03	4212	Dryer #2 combustion air fan	1	Dryer #2 combustion air fan	Metso	Operating	125	125				A1-2014-049-0202-F	
A	150-FAN-06	150	FAN	06	4212	Dryer #2 dilution air fan	1	Dryer dilution air fan	Metso	Operating	50	50				A1-2014-049-0202-F	
A	150-DRY-02	150	DRY	02	4212	Rotary dryer #2	1	4.3m diameter x 26m long type rotary drum dryer	Metso	Operating	750	750				A1-2014-049-0202-F	VFD by electrical
A	150-CHU-21	150	CHU	21	4226	Dryer #2 Discharge chute	1	Dryer discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0202-F	
A	150-OSA-02	150	OSA	02	4573	Online stream moisture analyzer	1	Online stream microwave moisture analyzer on dryer #2 discharge	Scantech International	Operating	3.7	3.7				A1-2014-049-0202-F	
A	150-DUC-02	150	DUC	02	4212	Dryer #2 dust collector	1	Multi-module pulse jet dust collector with carbon steel construction	Metso	No motor	0	0				A1-2014-049-0202-F	
A	150-FAN-04	150	FAN	04	4212	Exhaust fan #2	1	Dust collector fan	Metso	Operating	300	300				A1-2014-049-0202-F	
A	150-SCC-02	150	SCC	02	4212	Screw conveyor #2	1	Orthman Screw Conveyor	Metso	Operating	10	10				A1-2014-049-0202-F	
A	150-ROA-02	150	ROA	02	4212	Rotary valve #2	1	Meyer 12" x 12" HDX Rotary Air Lock (rotating valve)	Metso	Operating	10	10				A1-2014-049-0202-F	
A	150-CHU-22	150	CHU	22	4226	Discharge chute	1	Dryer #2 dust collector discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	150-CVO-05	150	CVO	05	4370	Dryer discharge conveyor	1	900mm W x 16m L x 2.5m vertical lift	B.I.D. Canada Ltd	Operating	19	19				A1-2014-049-0202-F	
A	150-CHU-31	150	CHU	31	4370	Discharge chute	1	Dryer discharge conveyor discharge chute	B.I.D. Canada Ltd	No motor	0.0	0.0				A1-2014-049-0202-F	
A	100-COM-01	100	COM	01	4125	Crushing area air compressor	1	GA18P-100-60 TM or equivalent	Met-Chem Database	Operating	25.0	25.0				A1-2014-049-0201-F	
A	100-AFI-01	100	AFI	01	4125	Air filter	1	Crusher compressor air filter	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-ADR-01	100	ADR	01	4125	Crushing area air dryer	1	Heat less desiccant air dryer CD60 or equivalent	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-ARE-01	100	ARE	01	4125	Crushing area air receiver	1	500 gallon vertical ASME air receiver	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-DUC-01	100	DUC	01	6600	Crushing area dust collector	1	Pulse jet baghouse dust collector SPJ-640-4T10 , surface area 7539 ft <sup>2</sup>	Rate Technology System	No motor	0.0	0.0				A1-2014-049-0201-F	
A	100-FAN-02	100	FAN	02	6600	Dust collector exhaust fan	1	Dust collector fan 83,000 CFM Twin City Fan Model BCS 660	Rate Technology System	Operating	224	224				A1-2014-049-0201-F	
A	100-SCC-01	100	SCC	01	6600	Dust collector screw conveyor	1	Orthman Screw Conveyor 12-inch Dia. x 16-ft long	Rate Technology System	Operating	5.6	5.6				A1-2014-049-0201-F	
A	100-ROA-01	100	ROA	01	6600	Dust collector rotary valve	1	Meyer 12" x 12" HDX Rotary Air Lock (rotating valve)	Rate Technology System	Operating	1.1	1.1				A1-2014-049-0201-F	
A	100-CHU-32	100	CHU	32	4226	Discharge chute	1	Crushing Area dust collector discharge chute	Met-Chem Database	No motor	0.0	0.0				A1-2014-049-0201-F	

SUMMARY																	
		100				Crushing and Screening - Area 100	58										
		150				Drying - Area 150	36										

# Jaw crusher Nordberg® C120™







# Jaw crusher Nordberg C120

The versatile Nordberg C120 jaw crusher has been engineered with no compromises for stationary quarrying and mining applications, while keeping in mind the specific requirements of mobile and portable applications. It has been designed to be a perfect fit for challenging large-scale contracting, aggregate and mining processes.

## Developed on the basis of true field experience

The crusher was developed on the basis of field experience from customer sites. Crusher cavity, kinematics and operating parameters have been defined and optimized to guarantee the excellent productivity for which Metso C jaws are known and valued. Crusher height utilization has been optimized to give the steepest possible cavity cross-section. Excellent nip angle high up in the cavity, together with an aggressive linear stroke at the bottom, ensure high throughput capacity and reduction. Outstanding reliability combines with excellent productivity to give the lowest cost per produced ton of end product.

## Easy to install

The C120 has a range of bolt-on options, including an on-board motor base, and guarding for the flywheel and drives made from specially developed composite materials, which makes the unit simple to install as a crusher only or as a complete module in a new or existing plant.

The crusher is mounted without bolts between crusher and structure using mounting pads, which absorb the dynamic forces thus reducing the dynamic loads transmitted to the structures underneath.

## Safe to operate and maintain

The C120 jaw crusher is designed to be safe to operate and maintain. There are a limited number of service points and they can be accessed easily and safely. Lifting tools for items such as jaw dies, cheek plates and the toggle plate are supplied with the crusher to guarantee safe maintenance procedures and to ensure the safety of both crusher operators and maintenance crew.

- Benefits:**
- Reliability
  - Productivity
  - Easy to install
  - Safety

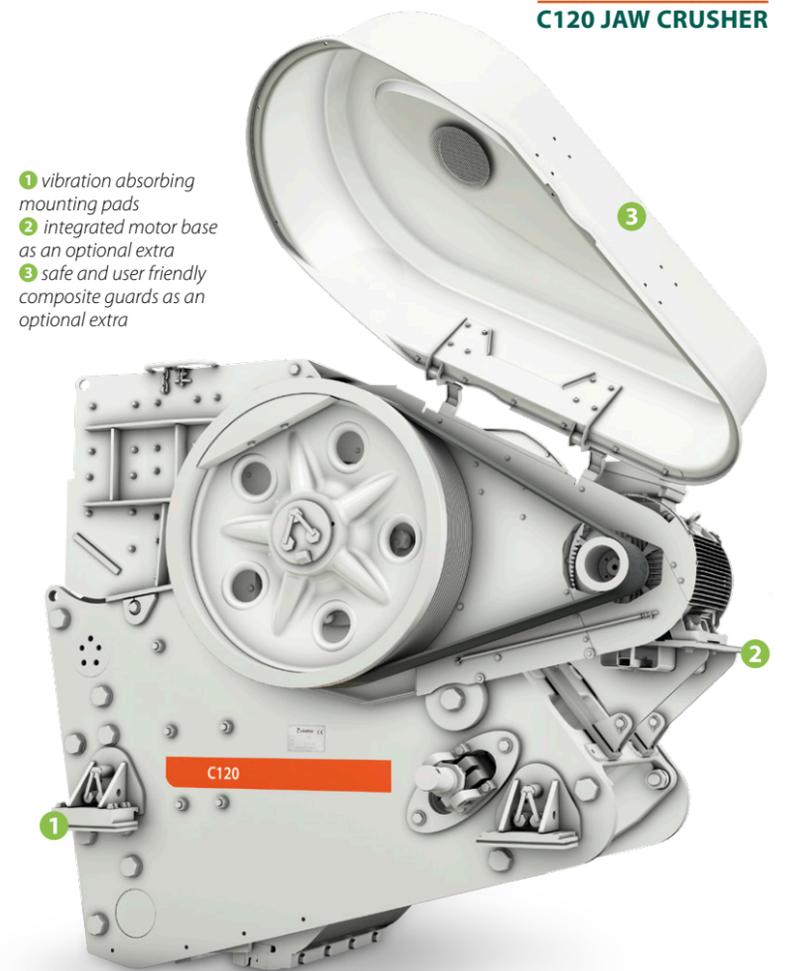
Technical specification	
Feed opening width	1200 mm (47")
Feed opening depth	870 mm (34")
Nominal power	160 kW (200 HP)
Weight (Basic unit)	26,000 kg (57,200 lbs)
Operating speed	230 rpm
Minimum c.s.s.	70 mm (2-3/4")
Maximum c.s.s.	200 mm (8")

Capacity		
Product size mm (in)	Closed side setting mm (in)	Mtph (Stph)
0-105	70	175 - 240
0-4 1/8	2 3/4	195 - 265
0-120	80	195 - 270
0-4 3/4	3 1/8	215 - 295
0-135	90	210 - 305
0-5 3/8	3 1/2	235 - 330
0-150	100	235 - 325
0-6	4	260 - 360
0-185	125	285 - 395
0-7	5	315 - 435
0-225	150	340 - 475
0-9	6	375 - 515
0-260	200	385 - 540
0-10	8	430 - 595

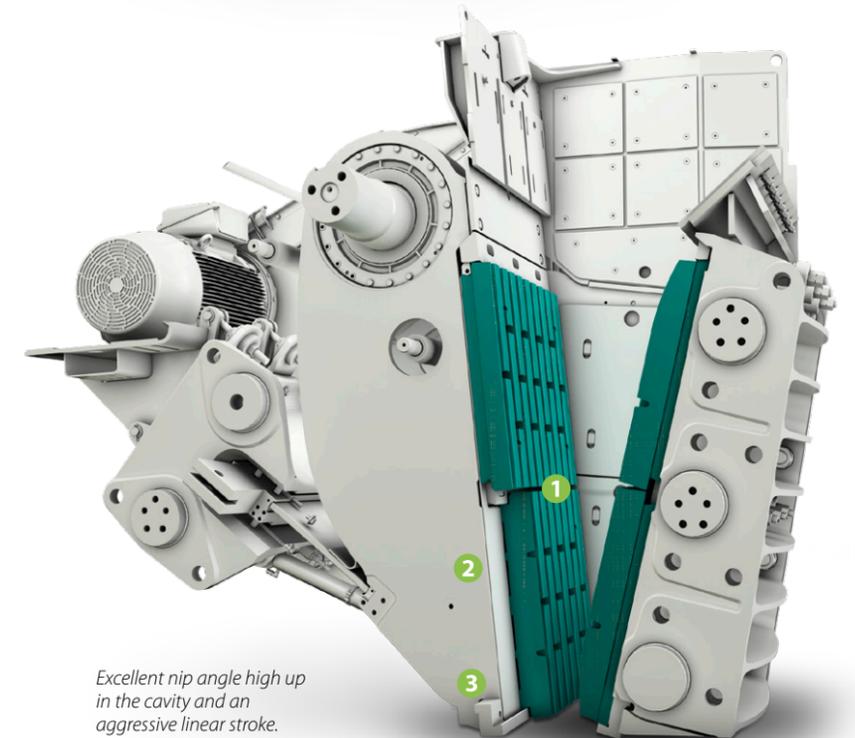
The above figures represent through the crusher capacities, which are based on a feed material with an average specific gravity of 2.7 t/m<sup>3</sup>, a maximum feed size that will enter the crusher without bridging and material finer than the crusher's closed side setting removed. The capacities may vary depending on the feeding method and on feed characteristics such as gradation, bulk density, moisture, clay content and crushability.

Measurement of the crusher's closed side setting varies depending on the jaw profile that is being used and has an impact on the crusher's capacity and product gradation. The following factors will enhance crusher capacity and performance:

1. Proper selection of the jaws.
2. Proper feed gradation.
3. Controlled feed rate.
4. Sufficient feeder capacity and width.
5. Adequate crusher discharge area.
6. Discharge conveyor sized to convey maximum crusher capacity.



- 1 vibration absorbing mounting pads
- 2 integrated motor base as an optional extra
- 3 safe and user friendly composite guards as an optional extra



Excellent nip angle high up in the cavity and an aggressive linear stroke.

- 1 single- or 2-piece jaw dies
- 2 casting protection plates
- 3 replaceable toe wedges







**Metso Corporation**, Lokomonkatu 3, P.O.Box 306, FI-33101 Tampere, Finland, tel. +358 20 484 142, fax +358 20 484 143  
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Cone crushers  
Nordberg® HP5™



Tailored  
performance!





# Nordberg® HP5 cone crusher

## Tailored performance!

Metso designed the HP5 with safety, simplicity and eco-efficiency in mind. Automatic settings, specialized maintenance tools, reduced emissions and energy-efficient motors are just a few of the improvements built into Metso's new cone crusher.

### Highest performance

The HP5 follows the successful HP3, HP4 and HP6 as the fourth model in all-new range of high-performance cone crushers. These new cone crushers enable you to produce much finer products using fewer crushing stages, thereby lowering your capital and energy costs. With a combination of optimized speed and a large throw, the HP5 provides the highest reduction ratios of any cone crusher on the market today.

Due to its highly efficient crushing action, the HP5 delivers maximum power utilization per cone diameter, so you save both with lower energy consumption per ton of end product and with a lower recirculation load. A higher cavity density improves interparticle crushing action for end products with more consistent gradation and superior shape.

### Less downtime and easy maintainance

An advanced fastening system for the mantle and bowl liner eliminates the need for backing material, and makes liner changes faster. Thicker liners mean more material to wear. The HP5 cone crusher is also easy to disassemble : all components are accessible from the top or side. The bowl and head are easily and safely removed with no interference.

### Energy efficient

In addition to being fitted with the latest in high-efficiency motors, HP5 generation crushers boast a higher output of finished product using the same amount of power.

The result is improved overall efficiency (less power consumed, more yield), and, as a bonus, lower carbon dioxide emissions, making these HP5 cone crushers the most environmentally friendly crushers on the market.

### Benefits

- Performance
- Reliability
- Energy efficient
- Less downtime
- Easy to maintain

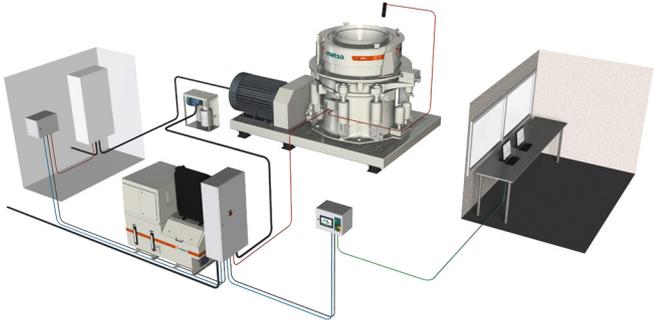
# HP5 Technical features

<b>No lead counterweight</b>
• Ecological conception, environmental
<b>No backing compound</b>
• Ecological conception, environmental
• Reduce maintenance downtime 30%
<b>Thicker liner</b>
• Frequency of maintenance reduced
<b>Hydraulic belts tensioning</b>
• Health and safety maintenance tool
<b>Head lifting tool &amp; head tightening tool</b>
• Health and safety maintenance tool
<b>Lifting points repositioning</b>
• Safety
<b>IC70C</b>
• Safe use of the crusher within factory parameters, while optimizing production
<b>IE3 motors</b>
• Highest efficiency

<b>Technical information</b>
• Nominal feed opening : 317 mm (12.46")
• Minimum setting : 8mm (0.31")
• Maximum power : 370 kW (500 hp)
• Complete crusher weight : 29,000 kg (64,000 lb)



# Metso IC70C crusher automation



Easy integration to any plant automation system is one of the benefits of Metso IC70C



IC70C control panel

Metso IC70C automation ensures complete performance and is precisely designed to meet your expectations and crushing plant requirements for consistent production, safety and easy control of crusher parameters.

The IC70C automation system brings precision and consistency to your crusher operations. This leads to predictable and stable production and end-product quality, ensuring profitable operation of both the crusher and the entire crushing plant. With optimized start-up and shut-down procedures and sequences integrated into the IC automation system, you can be sure that the crusher is working correctly in all circumstances and that crusher downtime is minimized.

Metso IC70C automation allows you to maximize the performance of your high-quality Metso crushers. This is done with carefully defined safety parameters for oil temperature, power draw and oil pressure, which are indicators of the actual crusher load. Metso IC70C automation monitors the crusher condition and gives an early indication if there's a problem. This can help solve a problem before it becomes serious and costly.



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PERMIT / AUTHORIZATION	LEGISLATION / REGULATION	PROJECT COMPONENT / ACTIVITY	DEPARTMENT / AGENCY	NOTES
<b>Government of Newfoundland and Labrador</b>				
Development Plan and Rehabilitation and Closure (R&C) Plan Approval	<i>Mining Act and Mining Regulations</i>	Project development	Mines Branch, Department of Natural Resources	The <i>Mining Act</i> includes a number of key requirements which pertain to mine development in the province, including the preparation and approval of a Development Plan and a Rehabilitation and Closure (R&C) Plan, as well as the posting of appropriate Financial Assurances
Surface Lease		Any mining development on Crown Lands	Mineral Lands Division, Department of Natural Resources	A Surface Lease issued under Section 33 of the <i>Mineral Act</i> is required for development of a Mining Lease issued under the Act
Mineral Exploration Approval		Any mineral exploration and geotechnical activities within a Mining Lease or Mineral Licence		An application for Exploration Approval must contain a detailed plan and description of the proposed activities
Certificate of Approval for any Alteration to a Body of Water	<i>Water Resources Act</i>	Any activities which may alter a water body, including in or near water works	Water Resources Management Division, Department of Environment and Conservation	Permits are required for construction activities within 15 m of the high watermark of any water body as well as any in-stream activity. <ul style="list-style-type: none"> <li>- Schedule A –Culverts</li> <li>- Schedule B –Bridges</li> <li>- Schedule C –Dams</li> <li>- Schedule D –Fording</li> <li>- Schedule E –Pipe Crossing – Water Intake</li> <li>- Schedule F –Stream Modification or Diversion</li> <li>- Schedule G –Small Bridges</li> <li>- Schedule H –Other Alterations</li> </ul>
Certificate of approval to operate Howse	<i>Environmental act</i>	For all activities including discharge to environment; waste rock localization	NL Department of Environment and Conservation	
Water Use License	<i>Water Resources Act</i>	Water withdrawal for use in construction and operation activities	Water Resources Management Division, Department of	Water use authorization is required for all beneficial uses of water

PERMIT/AUTHORIZATION	LEGISLATION / REGULATION	PROJECT COMPONENT/ACTIVITY	DEPARTMENT / AGENCY	NOTES
Application for Permit for Constructing a Non-Domestic Well		Establishment of a water well	Environment and Conservation	A license is required to establish a non-domestic water well in Newfoundland and Labrador
Policy Directives		Project activities		The Department has a number of potentially applicable policy directives in place, including those related to: Infilling Bodies of Water; Development in Wetlands; and others
Quarry Permit (if required)	<i>Quarry Materials Act and Regulations</i>	Extracting borrow material	Mineral Lands Division, Department of Natural Resources	A permit is required to dig for, excavate, remove and dispose of any Crown quarry material
Commercial Cutting Permit		Clearing land areas for the Project		A permit is required for the commercial cutting of timber on Crown Land
Operating Permit	<i>Forestry Act and Cutting of Timber Regulations</i>		Department of Natural Resources	
Permit to Burn (empty explosive box)		Any burning required during the Project		A permit is required to light fires outdoors between April and December. Permits are not issued during forest fire season
Certificate of approval for diesel generators	<i>Environmental Protection Act, Air Pollution Control Regulations</i>	Any diesel generators or other project components or activities with air emissions	Pollution Prevention Division, Department of Environment and Conservation	The Regulations outline specific ambient air quality standards and emission standards, as well as relevant engineering design (e.g., stack height) requirements and other provisions
Fuel Tank Registration - Storing and Handling Gasoline and Associated Products	<i>Environmental Protection Act, and Storage and Handling of Gasoline and Associated Products Regulations</i>	Storing and handling gasoline and associated products	Engineering Services Division, Service NL	Fuel Tank Registration is required for storing and handling gasoline and associated products
Mobile Fuel Storage Tank Relocation Request Form (if required)	<i>Environmental Protection Act and Environmental</i>	Temporary fuel storage		A permit is required for any temporary fuel storage in a remote location

PERMIT/AUTHORIZATION	LEGISLATION / REGULATION	PROJECT COMPONENT/ACTIVITY	DEPARTMENT/ AGENCY	NOTES
	<i>Guidelines for Fuel Cache Operations</i>			
Permit for Storage, Handling, Use or Sale of Flammable and Combustible Liquids	<i>Fire Prevention Act, and Fire Prevention Flammable and Combustible Liquids Regulations</i>	Storing and handling flammable liquids		This permit is issued on behalf of the Office of the Fire Commissioner. Approval is based on information provided for the Certificate of Approval for Storing and Handling Gasoline and Associated Products
Certificate of Approval for Collecting or Transporting Used Oil	<i>Environmental Protection Act, Used Oil Control Regulations</i>	Information on the equipment used for collecting and transporting used oil.		A person shall not engage in the collection, transportation and storage of used oil without first applying for a certificate of approval.
Wildlife management license (if required)	<i>Wildlife Act</i>	Dealing with nuisance wildlife	Department of Natural Resources	The Department provides direction on handling nuisance animals. Details on the situation must be provided for a permit to be issued
Compliance Standard	<i>Fire Prevention Act, Fire Prevention Regulations</i>	On-site structures (temporary or permanent)	Engineering Services Division, Service NL	All structures must comply with fire prevention standards
Compliance Standard	<i>Occupational Health and Safety Act, Workplace Hazardous Materials Information System Regulations</i>	Handling and storage of hazardous materials	Operations Division, Service NL	Outlines procedures for handling hazardous materials and provides details on various hazardous materials
Building Accessibility Exemption Registration	<i>Building Accessibility Act and Regulations</i>	Any buildings required to support the project that do not require public access.		Exemption from building access requirements should be made for all buildings related to the project
Electrical Permit and Inspection	<i>Public Safety Act, Electrical Regulations</i>	Infrastructure for the project requiring electrical wiring	Program and Support Services Division, Service NL	Electrical work must be completed under permit by a registered contractor or the work must be inspected by Service, NL

PERMIT/AUTHORIZATION	LEGISLATION / REGULATION	PROJECT COMPONENT/ACTIVITY	DEPARTMENT / AGENCY	NOTES
Fire and Life Safety Plan Review	<i>Fire Protection Services Act</i>	Any building required to support the project	Engineering and Inspections Division, Service NL	All commercial building plans must be approved with regard to fire prevention and suppression systems
<b>Government of Canada</b>				
Letter of Advice or Authorization for Works or Undertakings Affecting Fish Habitat	<i>Fisheries Act</i>	Any activities in or near water that may support a fishery	Fisheries and Oceans Canada	DFO has established Newfoundland and Labrador Operational Statements for various activities. These are available online ( <a href="http://www.dfo-mpo.gc.ca/habitat/what-quoi/os-eo/nl/index-eng.asp">http://www.dfo-mpo.gc.ca/habitat/what-quoi/os-eo/nl/index-eng.asp</a> ) and outline environmental protection measures that, if followed during construction and maintenance activities, will result in no contravention of Section 35 of the <i>Fisheries Act</i>  DFO will make a determination on the level of risk associated with the project activity. If it is determined to be a low risk then a Letter of Advice may be issued. If it is determined to be a higher level of risk an Authorization may be required
Compliance Standard / letter of acceptance	<i>Fisheries Act</i> , Section 36(3), Deleterious Substances	Any run-off from the Project site being discharged to receiving waters	Environment Canada	Environment Canada is responsible for Section 36(3) of the <i>Fisheries Act</i> . Discharge must not be deleterious and must be acutely non-lethal
Compliance Standard	<i>Migratory Birds Convention Act and Regulations</i>	Any activities which could result in the mortality of migratory birds and endangered species and any species under federal authority	Canadian Wildlife Service, Environment Canada	Prohibits disturbing, destroying or taking a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, and possessing a live migratory bird, carcass, skin, nest or egg. The Canadian Wildlife Service should be notified about the

PERMIT/AUTHORIZATION	LEGISLATION / REGULATION	PROJECT COMPONENT/ACTIVITY	DEPARTMENT/ AGENCY	NOTES
				mortality of any migratory bird in the Project area
Policy	Federal Policy on Wetland Conservation	Any disruption of wetland habitat	Environment Canada	The goals of this policy should be considered where a project could affect wetland habitat
NAV Canada notice	Transport regulation	Blasting notice for flight information	NAV Canada / Transport Canada	Flight notice ( NOTAM )



