Baffinland Iron Mines Corporation

HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT PLAN

BAF-PH1-830-P16-0011

Rev 3

Prepared By: Nick Kuzyk
Department: Environment
Title: Environmental Coordinator
Date: March 20, 2015
Signature:

Approved By: Jim Millard
Department: Environment
Title: Environmental Manager
Date: March 20, 2015
Signature:

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TRACK CHANGES TABLE

A review and update of the Hazardous Materials and Hazardous Waste Management Plan has been undertaken, with the following salient revisions to the March 25, 2014 version (**BAF-PH1-830-P16-0011**, Rev 2).

Index of Major Changes/Modifications in Revision 3

Item No.	Description of Change	Relevant Section
1	Updated introduction section to consider the 2015 Work Plan	Section 1.1
2	Updated and moved section 3.1 to 5.1	Section 3.1
3	Updated and reorganized Major Hazardous Material On-Site section	Section 4
4	Added hydrocarbon contaminated soils in Major Hazardous Materials section	Section 4.5
5	Added Hazardous Materials Approval	Section 5.2
6	Updated Hazardous Waste Management Method (Table 5-2)	Section 5
7	Updated Estimated Hazardous Waste Generation Per Annum (Table 5-3)	Section 5
8	Roles and Responsibility section updated to reflect current project structure	Section 6
9	Updated References	Section 11
10	Removed MSDS sheets appendix	Appendix A
11	Updated to include the 2015 Work Plan	Appendix B

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Abbreviations

Acronym	Description
Baffinland	Baffinland Iron Mines Corporation
CCME	Canadian Council of Ministers of the Environment
EHS	Environmental, Health and Safety
EIS	Environmental Impact Statement
EPCM	Engineering, procurement, and construction management
EPP	Environmental Protection Plan
ERCB	Energy Resources Conservation Board
IIBA	Inuit Impacts Benefits Agreement
the Project	Mary River Project
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
NWT	Northwest Territories
QIA	Qikiqtani Inuit Association
TDG	Transportation of Dangerous Goods
TDGA	Transportation of Dangerous Goods Act
TDGR	Transportation of Dangerous Goods Regulation
VEC	valued ecosystem components
WMP	waste management plan

1 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) is committed to taking the necessary steps to ensure that the use, collection, handling, storage, transportation and disposal of hazardous wastes generated during the construction, operation and closure of the Mary River Project is conducted in a safe, efficient and environmentally compliant manner. A key step in achieving this goal is the preparation and ongoing revisions of the Hazardous Materials and Hazardous Waste Management Plan for Construction, Operation and Closure (the Plan). The Plan establishes the roles and responsibilities of employees, contractors and other site personnel, as well as presenting protocols for handling, storing and disposing of hazardous materials on site. The intent is to afford a high degree of control over the use, collection, handling, storage, transportation and disposal of hazardous materials.

1.1.1 2015 Work Plan Update

A 2015 Work Plan was submitted to the Nunavut Water Board and other agencies on October 31, 2014. On December 12, 2014 Baffinland submitted the 2015 Work Plan Addendum which was an update to the 2015 Work Plan submitted on October 31, 2014 (see Appendix A). The purpose of this Addendum was to include additional work scope for 2015 that was not captured in the October 31, 2014 submission. Works and activities proposed have been screened by the NIRB, unless noted otherwise, and have been considered in the Project Certificate No. 005 issued by the NIRB on December 28, 2012.

Continued development and construction of infrastructure in 2015 includes:

- If required, additional dredging to maintain the required vessel draft depths. Suitable dredged material will be used as backfill within the ore dock structure.
- Install an additional hazardous waste containment cell at Milne Port
- Construct hazardous waste and fuel containment berms at the Mine Site.
- Extend the Mine Site landfill to increase capacity based on the approved design area.

In addition, progressive reclamation plans for 2015 include the follow activities:

- Ongoing long term management of calcium chloride salt storage and use at the Project Site. This includes waste segregation of salt bags and proper disposal of collected materials as well as identifying and containing compromised salt packages to prevent materials being distributed around the site.
- Ongoing testing, managing, and disposal of the historical inventory of incinerator bottom ash at the Mary River Mine Site and Milne Port.
- Completion of the decommissioning of the historical bladder farm at Milne Port. Work includes management of hydrocarbon impacted soils within the existing landfarm facility.
- Continuation of the decommissioning activities the existing bladder farm at the Mary River Mine Site. Work includes the treatment of oily water contact water and the management/storage of hydrocarbon impacted soils prior to placement in a landfarm facility. Consideration will be given to

designing and constructing a new landfarm at the Mary River Mine Site during 2015, located adjacent to the existing landfill area.

- Demobilization of equipment and supplies not required for near term activities, as well as the current inventory of hazardous waste and other materials by means of sealift from Milne Port Site.
- Continued development of the Mine Site landfill and deposition of non-hazardous wastes in accordance with the Landfill Maintenance and Operations Manual. Consideration will be given to designing and constructing a new landfill at the Milne Port Site if it is deemed necessary during 2015. Note that this activity would require application and approval from the NWB and QIA.

In order to support these activities, Baffinland will operate various hazardous waste and hazardous material handling infrastructure as described within this Plan. The current Type A Water License (2AM-MRY1325) and Type B Water License (2BB-MRY1416) authorize Baffinland to operate said infrastructure in accordance with the Nunavut Water Board conditions as described in the respective licenses. The QIA Commercial Lease Commercial Lease No.Q13C301 allows Baffinland to undertake the approved activities on specified Inuit Owned Land (IOL).

The Hazardous Materials and Hazardous Waste Management Plan (the Plan) is an update to the existing plan and supersedes the BAF-PH1-830-P16-0011, Revision 2, dated March 2014. The hazardous material and hazardous waste management infrastructure at Milne Port and Mine Site project sites will continue to be used as currently approved and designed. For 2015, this plan will be applied as appropriate to project sites applicable under the existing Type B and Type A Water Licence including Milne Port and the Mary River Mine Site.

1.2 PURPOSE

The purpose of this plan is to provide a consolidated source of information on the safe and environmentally sound transportation, storage, and handling of the key hazardous materials or wastes that are required for use or generated from Project activities and processes. A hazardous material is one that, as a result of its physical, chemical, or other properties, poses a hazard to human health or the environment when it is improperly handled, used, stored, disposed of, or otherwise managed. In combination with the Emergency Response Plan (BAF-PH1-830-P16-0007) and the Spill Contingency Plan (BAF-PH1-830-P16-0036), this Hazardous Materials and Hazardous Waste Management Plan provides instruction on the prevention, detection, containment, response, and mitigation of accidents that could result from handling hazardous materials.

The plan is based on the following principles for best practice management of hazardous materials and/or waste:

- Identify and prepare materials and waste inventories.
- Characterize potential environmental hazards posed by those materials.

- Allocate clear responsibility for managing hazardous materials.
- Describe methods for transport, storage, handling and use.
- Identify means of long-term storage and disposal.
- Prepare contingency and emergency response plans.
- Ensure training for management, workers, and contractors whose responsibilities include handling hazardous materials.
- Maintain and review records of hazardous material consumption and incidents in order to anticipate and avoid impacts on personal health and the environment.

Baffinland recognizes that incorporating proper hazardous material management into other environmental management plans and systems leads to risk reduction, improved process control, and cost savings.

Hazardous materials to be used at the Mary River Project will be manufactured, delivered, stored, and handled in compliance with applicable federal and territorial regulation. Baffinland is strongly committed to preventing, to the greatest extent possible, both inadvertent release of these substances to the environment and accidents resulting from mishandling or mishap. Baffinland will implement programs for employee training, facility inspection, periodic drills to test systems, and procedural review to address deficiencies, accountability, and continuous improvement objectives.

Baffinland will actively work towards minimizing the generation of hazardous wastes by investigating practical alternatives to the use of specific hazardous materials, by recycling products and containers wherever feasible, and by treating wastes using best practice technologies before any permitted release or discharge to the receiving environment.

1.3 DEFINITIONS

Project	:	The necessary tasks and work executed during the lifespan of the Project at the Project Site, including the construction, operation, closure and reclamation phases, of the Project.
Site	:	The areas occupied by the Project facilities (permanent or temporary) during the construction, operation, closure and reclamation phases of the Project.
Contractor	:	A person or business which provides goods, material, equipment, personnel, and/or services to Baffinland Iron Mines Corporation under terms specified in a contract.

Waste	:	The residual waste material (hazardous, non-hazardous or Putrescible) generated during the construction, operation, closure and reclamation phases of the Project.
Hazardous Waste	:	The wastes generated during the lifespan of the Project that present a threat to the human health or the environment because they exhibit one or more of the following characteristics: corrosive, reactive, explosive, toxic, inflammable, or biologically infectious.
Non-Hazardous Waste	:	The wastes generated during the lifespan of the Project that do not present a threat to human health or the environment.
Putrescible Wastes	:	The wastes generated during the lifespan of the Project that degrade very rapidly, i.e., plants, food scraps or animal remains.
Incinerator Wastes	:	Waste identified as suitable for incineration based on incineration technology used on-site, applicable regulations and project approvals. Includes: food waste, domestic waste, packaging waste, wood waste, absorbents, and some types of filters (e.g., air filters)

1.4 HAZARDOUS MATERIALS REGULATORY REQUIREMENTS

Both federal and territorial legislation regulates the management of hazardous materials in Nunavut.

Copies of relevant legal documents will be kept on file at the Mine Site. Management and safety personnel will provide an overview of the applicable regulations to all employees as part of their initiation and ongoing training.

A number of Acts and Regulations provide specific requirements for the management of the different types of hazardous materials at the Mary River Project. They are:

1.4.1 FEDERAL

- Transportation of Dangerous Goods Act and Regulations (TDGA and TDGR).
- Explosives Act.
- National Fire Code.
- Canadian Council of Ministers for the Environment (CCME) Guidelines for Above-Ground Storage Tanks.

1.4.2 TERRITORIAL

- Transportation of Dangerous Goods Act (RSNWT 1988) and Regulations.

- Explosives Use Act and Regulations.
- Fire Prevention Act and Regulations.
- Mine Health and Safety Act and Regulations.
- Work Site Hazardous Materials Information System Regulations (WHMIS).

The TDGA classifies hazardous materials into nine main classes according to an internationally recognized system, as follows:

- Class 1 – Explosives.
- Class 1 – Gases.
- Class 3 – Flammable liquids.
- Class 4 – Flammable solids.
- Class 5 – Oxidizing substances and organic products.
- Class 6 – Poisonous (toxic) and infectious substances.
- Class 8 – Corrosives.
- Class 9 – Miscellaneous products or substances.

The Project is subject to Environmental Terms and Conditions in Baffinland's Commercial Lease with the QIA (Q13C301), a Type 'A' Water Licence and a Type 'B' Water Licence. Conditions regarding aspects of hazardous material and hazardous waste management as outlined in this Plan specified by the Commercial Lease Environmental Terms and Conditions (Schedule F) include:

- The Tenant shall remove all Drill Waste containing poisonous or persistent chemical additives to an approved disposal facility.
- The Tenant shall not allow any Drill Waste to spread to the surrounding lands or watercourses.
- The Tenant shall dispose of all combustible waste petroleum products by incineration or removal.
- The Tenant shall dispose of all toxic or persistent substances in a manner as approved in writing by the Landlord.
- The Tenant shall report spills immediately to the Landlord.

Conditions regarding aspects of hazardous waste and hazardous materials as outlined in this Plan are specified by the water license(s) and include:

- The Licencee shall prevent any chemicals, fuel or wastes associated with the undertaking from entering any Water body.

- The Licencee shall locate areas designated for waste disposal at a minimum distance of thirty-one (31) metres from the ordinary High Water Mark of any water body such that the quality, quantity or flow of water is not impaired, unless otherwise approved by the Board in writing.
- The Licensee shall remove from the project site, all hazardous wastes generated through the course of the Construction and Operations Phases, for disposal at an approved Waste Disposal Facility.
- The Licencee shall test the bottom ash generated by all Incinerator Systems, by using the acceptable test procedures for analyzing residuals, prior to being disposed of at any Landfill Facility. If the composition of the ash makes it unsuitable for disposal at the Landfill facilities, the Licencee shall direct the Waste to an appropriate facility for disposal. The records of analysis results and volumes of ash shall be maintained and provided to an Inspector upon request.
- The Licencee shall not open burn plastics, wood treated with preservatives, electric wire, Styrofoam, asbestos or painted wood, to prevent the deposition of waste materials of incomplete combustion and/or leachate from contaminated ash residual, from impacting any surrounding waters, unless otherwise approved by the Board in writing.
- The Licencee shall submit to the Board and the Inspector, thirty (30) days prior to the removal and transfer of waste, a declaration of authorization from any community receiving waste from the project, which clearly states that authorization has been granted for the deposit by the Licencee at the Hamlet's appropriately licenced facilities.
- The Licencee shall provide at least ten (10) days' notice to the Inspector prior to planned Discharges from any Waste Management Facility, Oily Water/Wastewater Treatment Facilities, Sewage Treatment Facilities, and any other relevant facilities associated with the Project. The notice shall include the estimated volume proposed for Discharge and the location and description of the receiving environment.
- The Licencee shall maintain records of all Waste backhauled from the Mary River Project and confirmation of proper disposal through the use of Waste manifest tracking systems and registration with the Government of Nunavut, Department of Environment. These records shall be made available upon request, to an Inspector or the Board.

1.5 Relationship to Other Management Plans

This plan is based on the concepts and principles found in Baffinland's EHS Management System Framework Standard (BAF-PH1-830-STD-0001) and Baffinland's Hazard Identification and Risk Assessment Standard (BAF-PH1-830-PRO-0001). This plan should be viewed in concert with the following additional plans:

- Air Quality and Noise Abatement Management Plan (BAF-PH1-830-P16-0002)
- Emergency Response Plan (BAF-PH1-830-P16-0007)

- Environmental Protection Plan (BAF-PH1-830-P16-0008)
- Explosives Management Plan (BAF-PH1-830-P16-0009)
- Fresh Water, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010)
- Interim Mine Closure and Reclamation Plan (BAF-PH1-830-P16-0012)
- Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan (BAF-PH1-830-P16-0026)
- Terrestrial Environmental Management and Monitoring Plan (BAF-PH1-830-P16-0027)
- Waste Management Plan (BAF-PH1-830-P16-0028)
- Spill Contingency Plan (BAF-PH1-830-P16-0036)

1.6 BAFFINLAND'S COMMITMENTS

Baffinland provides adequate resources to implement and maintain the EHS Management System including the necessary human, material and financial resources. Baffinland's Heath Safety and Environment (HSE) Policy and Baffinland's Sustainable Development Policy are presented in Section 2.

1.7 UPDATE OF THIS MANAGEMENT PLAN

The Hazardous Materials and Hazardous Waste Management Plan is a "living document". It will be regularly updated on the basis of management reviews (as outlined in Section 9), incident investigations, regulatory changes or other Project related changes.

2 BAFFINLAND POLICY

2.1 HEALTH SAFETY AND ENVIRONMENT (HSE) POLICY

Baffinland
Iron Mines Corporation

Mary River Project
Health, Safety and Environment Policy

The Baffinland Iron Mines Corporation (BIMC) Mary River Project Health, Safety and Environment Policy is a statement of our commitment to achieving a safe, healthy and environmentally responsible workplace. We will not compromise this policy for the achievement of any other organizational goal.

The Mary River Project implements this Policy through the following commitments:

- Continual improvement of safety, occupational health and environmental performance.
- Meeting or exceeding the requirements of regulations and company policies.
- Integrating sustainable development principles into our decision-making processes.
- Maintaining an effective Health, Safety and Environment Management System.
- Sharing and adopting improved technologies and best practices to prevent injuries, occupational illnesses and environmental impacts.
- Engaging stakeholders through open and transparent communication.
- Efficiently using resources, and practicing responsible minimization, reuse, recycling and disposal of waste.
- Rehabilitation of disturbed lands to a safe, acceptable, and localized state.

Our commitment to provide the leadership and action necessary to accomplish this policy is exemplified by the following principles:

- All injuries, occupational illnesses and environmental impacts can be prevented.
- Employee involvement and active contribution is essential and required.
- Management is responsible for preventing injuries, occupational illnesses and environmental impacts.
- Working in a manner that is healthy, safe and environmentally sound is a condition of employment.
- All operating exposures can be safeguarded.
- Training employees to work in a manner that is healthy, safe and environmentally sound is essential.
- Prevention of personal injuries, occupational illnesses and environmental impacts is good business.
- Respect for the communities in which we operate is the basis for productive relationships.

We have a responsibility to provide a safe workplace and utilize systems of work to meet this goal. All employees must be clear in understanding the personal responsibilities and accountabilities in relation to the tasks we undertake.

The Mary River Project has no higher priority than the health and safety of all people working on our behalf and the responsible management of the environment. In ensuring our overall profitability and business success every Baffinland and business partner employee working at one of our work sites is required to adhere to this policy.

Tom Peddon
President and Chief Executive Officer
March 2013

2.2 BAFFINLAND SUSTAINABLE DEVELOPMENT POLICY

At Baffinland Iron Mines Corporation, we are committed to conducting all aspects of our business in accordance with the principles of sustainable corporate responsibility and always with the needs of future generations in mind. Everything we do is underpinned by our responsibility to protect the environment, to operate safely and fiscally responsibly and to create authentic relationships. We expect each and every employee, contractor, and visitor to demonstrate a personal commitment to this policy through their actions. We will communicate the Sustainable Corporate Policy to the public, all employees and contractors and it will be reviewed and revised as necessary on an annual basis.

These four pillars form the foundation of our corporate responsibility strategy:

Health and Safety
Environment
Investing in our Communities and People
Transparent Governance

1.0 HEALTH AND SAFETY

- We strive to achieve the safest workplace for our employees and contractors; free from occupational injury and illness from the very earliest of planning stages. Why? Because our people are our greatest asset. Nothing is as important as their health and safety.
- We report, manage and learn from injuries, illnesses and high potential incidents to foster a workplace culture focused on safety and the prevention of incidents.
- We foster and maintain a positive culture of shared responsibility based on participation, behaviour and awareness. We allow our workers and contractors the right to stop any work if and when they see something that is not safe.

2.0 ENVIRONMENT

- We employ a balance of the best scientific and traditional Inuit knowledge to safeguard the environment.
- We apply the principles of pollution prevention and continuous improvement to minimize ecosystem impacts, and facilitate biodiversity conservation.
- We continuously seek to use energy, raw materials and natural resources more efficiently and effectively. We strive to develop pioneering new processes and more sustainable practices.
- We understand the importance of closure planning. We ensure that an effective closure strategy is in place at all stages of project development and that progressive reclamation is undertaken as early as possible to reduce potential long-term environmental and community impacts.

3.0 INVESTING IN OUR COMMUNITIES AND PEOPLE

- We respect human rights and the dignity of others. We honour and respect the unique culture, values and traditions of the Inuit people.
- We contribute to the social, cultural and economic development of sustainable communities adjacent to our operations.
- We honour our commitments by being sensitive to local needs and priorities through engagement with local communities, governments, employees and the public. We work in active partnership to create a shared understanding of relevant social, economic and environmental issues, and take their views into consideration when making decisions.

4.0 TRANSPARENT GOVERNANCE

- We will take steps to understand, evaluate and manage risks on a continuing basis, including those that impact the environment, employees, contractors, local communities, customers and shareholders.
- We ensure that adequate resources are available and that systems are in place to implement risk-based management systems, including defined standards and objectives for continuous improvement.
- We measure and review performance with respect to our environmental, safety, health, socio-economic commitments and set annual targets and objectives.
- We conduct all activities in compliance with the highest applicable legal requirements and internal standards

We strive to employ our shareholder's capital effectively and efficiently. We demonstrate honesty and integrity by applying the highest standards of ethical conduct.

Tom Paddon
President and Chief Executive Officer
September 2011

3 TARGETED VALUED ECOSYSTEM COMPONENTS

Hazardous materials used and hazardous waste will be generated throughout the life cycle of the Project. To ensure that hazardous materials and/or wastes are handled, stored and managed in a safe and environmentally acceptable manner, Baffinland will apply best practices for its hazardous materials management activities.

Inappropriate handling, storage and discharge/release of hazardous materials could impact the following Valued Ecosystem Components (VEC):

- Soils (spills and contamination).
- Water quality (contamination of runoff).
- Fish and fish habitat.
- Vegetation (uptake of contaminants or loss of vegetation).
- Birds (exposure and ingestion of contaminants).
- Terrestrial wildlife (exposure and ingestion of contaminants).
- Human health (exposure and ingestion of contaminants).

4 MAJOR HAZARDOUS MATERIALS ON-SITE

4.1 AMMONIUM NITRATE AND EXPLOSIVE MATERIALS

Ammonium nitrate (AN) is essentially a fertilizer product with formula NH_4NO_3 manufactured and used for agricultural purposes in many parts of the world. It is also used in the manufacture of commercial blasting explosives, and is an important raw material in the manufacture of other products such as nitro-glycerine, water gels/slurries, and other types of blasting emulsions.

AN is a stable, inorganic, solid compound. It is completely soluble in water and must be kept dry to remain effective for its intended purpose. AN when in solution can be highly toxic to fish and can enhance the potential for eutrophication in the aquatic receiving environment (Guideline for the Release of Ammonia Dissolved in Water Found in Wastewater Effluents, Environmental Canada, 2013).

Although AN is classified as a hazardous product, its storage and handling at Mary River do not represent significant risk when the proper precautions are taken. At site, qualified explosives contractors manage AN and other explosives-related materials. The AN tote bags (usually one cubic metre volume) must be stored in a safe area away from water bodies and from the explosives storage magazine. AN bags will be handled individually when needed for the preparation of batches of explosive. Any spills will be swept up and placed in suitable containers for use or disposal. Empty bags are not considered to be hazardous waste, and will be burned in the site incinerator. Personnel exposed to AN will wear suitable personal protective equipment.

In Canada, the production, storage, and use of AN and explosive materials are subject to strict precautionary measures under the Explosives Act and Regulations, and the Canada Transportation Act, Ammonium Nitrate Storage Facilities Regulations. The Explosives Act is administered by the Explosives Regulatory Division (ERD) of Natural Resources Canada. Storage, use, and handling of blasting materials are strictly regulated in Nunavut. All explosives handling, use and storage will be performed in accordance to the Mary River Project: Explosives Management Plan and will be performed by a licensed contractor. **Error! Reference source not found.**

TABLE 4-1: EXPLOSIVES - HAZARD CLASSES AND POTENTIAL IMPACTS

Material	Class	Potential Impact
Ammonium nitrate	5.1	Water contamination
High explosive detonators	1	Negligible with proper handling
Blasting caps	1	Negligible with proper handling

4.2 SEWAGE SLUDGE

Sewage sludge on site must be treated and disposed of in a safe and effective manner. Appropriate PPE should be provided for workers likely to have exposure to treated sewage sludge. The choices of PPE include goggles, splash-proof face shields, respirators, liquid-repellent coveralls, and gloves. Face shields

should be made available for all jobs in which there is a potential for exposure to spray or high-pressure leaks. Hand-washing stations with clean water and mild soap should be readily available whenever contact with treated sewage sludge occurs. In the case of workers in the field, portable sanitation equipment, including clean water and soap, will be provided. Cabs should be wiped down and cleaned of residual mud (or settled dust) frequently to reduce potential for exposure to treated sewage sludge.

Periodic training on standard hygiene practices for treated sewage sludge workers should be conducted by qualified safety and health professionals to cover issues such as the following:

- Frequent and routine hand washing (the most valuable safeguard in preventing infection by agents present in treated sewage sludge), especially before eating or smoking.
- The proper use of appropriate PPE.
- The removal of contaminated PPE and the use of available on-site showers, lockers, and laundry services.
- Proper storage, cleaning, or disposal of contaminated PPE.
- Instructions that work clothes and boots should not be worn home or outside the immediate work environment.
- Prohibition of eating, drinking, or smoking while working in or around treated sewage sludge.
- Procedures for controlling exposures to chemical agents that may be in treated sewage sludge.

4.3 FUELS AND LUBRICANTS

Hydrocarbon products and chemicals such as combustible diesel fuels, toxic anti-freeze, compressed gases, lubricants, and cutting oils are widely used in the North. These products meet vital needs for power generation, heating, and vehicle operation. Diesel fuel is by far the largest volume of petroleum hydrocarbon product shipped annually to communities in Nunavut. The potential environmental dangers of transporting and burning diesel fuels are well understood. The transportation, storage, and handling of diesel products are strictly regulated by both federal and territorial legislation. Baffinland will ensure that all such requirements are met and emphasize the need for regular inspection of storage and distribution facilities on site to ensure mechanical soundness and to prevent leaks and the uncontained release of diesel fuel.

Material categories, site handling and storage requirements recommended by manufacturers in MSDSs are summarized in TABLE 4-2 and TABLE 4-3.

TABLE 4-2: FUEL PRODUCTS – HAZARD CLASSES, POTENTIAL IMPACTS AND STORAGE LOCATIONS

Material	Class	Total Amount – Container	Potential Impact
Diesel	3	Refer to Appendix A	Water and soil contamination
Aviation fuel	3		Water and soil contamination
Motor oil	NR	TBD – Barrels and/or pails	Soil contamination
Hydraulic fluid	NR	TBD – Barrels and/or pails	Soil contamination
Varsol	3	TBD – Barrels and/or pails	Soil contamination
Vehicle grease	NR	TBD – Barrels and/or pails	Negligible risk with proper handling
Ethylene glycol	NR	TBD – Barrels and/or pails	Negligible risk with proper handling

NR: Not Regulated

TABLE 4-3: FUEL PRODUCTS - SAFE HANDLING PROCEDURES

Material	Handling Procedure
Diesel	Do not get in eyes, on skin, or on clothing. Avoid breathing vapours, mist, fume, or dust. Do not swallow. May be aspirated into lungs. Wear protective equipment and/or garments if exposure conditions warrant. Wash thoroughly after handling. Launder contaminated clothing before reuse. Use with adequate ventilation. Keep away from heat, sparks, and flames. Store in a well-ventilated area. Store in a closed container. Bond and ground during transfer.
Aviation fuel	See diesel procedures above.
Motor oil	Wear protective clothing and impervious gloves when working with used motor oils.
Hydraulic fluid	Keep container closed until ready for use.
Varsol	Avoid eye contact. Use with adequate ventilation. Wash thoroughly after handling. Empty container retains residue. Follow label instructions. Avoid repeated skin contact. Store in cool, ventilated area, away from ignition sources and incompatibles. Keep container tightly closed.
Vehicle grease	Minimize breathing vapor, mist, or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean before re-use; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water. To prevent fire or explosion risk from static accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Code. Keep containers closed when not in use. Do not store near heat, sparks, flame, or strong oxidants.
Ethylene glycol	Ensure adequate ventilation. Wear protective gloves and chemical safety goggles. Keep in tightly closed container, stored in a cool, dry, ventilated area. Separate from acids and oxidizing materials. Empty containers of this product retain product residues and may be hazardous.

A contract supplier or trained Baffinland employee will fill the fuel storage tanks in the main tank farms at Milne Port and the Mary River Mine Site. General procedures to be followed are listed below. Similar procedures would be followed for fuelling remote station tanks.

Before fuel transfer, verify that:

- All fuel transfer hoses have been connected properly and couplings are tight.
- Transfer hoses are not obviously damaged.
- Fuel transfer personnel are familiar with procedures.
- Personnel are located at both the fuel delivery truck and fuel transfer tank(s) and can manually:
  - Shut off the flow of fuel.
  - If a high liquid level shutoff device is installed at the delivery tank, verify that the shutoff is operating correctly each time it is used.
  - Fuel transfer will then proceed per the established procedures of the contract supplier.
  - Any accidents or spills must be reported immediately to the Environmental Manager.

On closure of the mine and facilities, some storage capacity will be left in place at site for diesel fuel for the use of personnel involved in close-out and reclamation activities. Small amounts of other petroleum products will also continue to be available. More details are provided in the Interim Mine Closure and Reclamation Plan (BAF-PH1-830-P16-0012).

4.4 HYDROCARBON CONTAMINATED SOILS

Soils contaminated by hydrocarbons from spills will be salvaged and deposited within a land farm cell for bioremediation. The cell will be confined within a berm and underlain by an Arctic geomembrane beneath select fill material. The contaminated soils will be placed and spread during summer months for remediation through natural microbiological and evaporative processes. Soil that has reached acceptable levels of hydrocarbon degradation will be removed and transferred to the landfill or other appropriate use. The land farm will be operated in accordance with Nunavut government guidelines and the recommendations of the design engineer. The soil will be turned regularly to provide aeration and promote the remediation process. Periodic inspections and sampling will be conducted to assess the effectiveness of the cell. See Appendix C for the Landfarm Operation and Maintenance Manual.

5 HAZARDOUS MATERIALS/WASTE LIFECYCLE APPROACH

The aim of the Hazardous Materials and Hazardous Waste Management Plan is to implement a sound hazardous materials minimization program that will focus upon the principles of Lifecycle Management, with the goal of managing the material from procurement/site delivery to its use/disposal. The Hazardous Materials and Hazardous Waste Management approach is in conformance with Hazard Identification and Risk Assessment Standard (BAF-PH1-830-PRO-0001). It covers product supply, transportation, storage, and handling, recycle, and waste disposal. Baffinland is committed to ensuring proper life cycle management of all products used at the Mary River sites, including hazardous materials. Baffinland and its contractors will deal only with reputable, certified suppliers, transporters, and expediters.

5.1 TYPES OF HAZARDOUS MATERIALS/WASTES

The Mary River Project will require the use of the following types of classified hazardous materials:

- Waste hydrocarbons and hydrocarbon products – fuel, lubricants, and solvents used for equipment operation and maintenance.
- Explosives – ammonium nitrate and high explosives used for blasting in the mine.
- Laboratory chemical wastes – various by-products classified as hazardous waste and chemicals used in the assay laboratory.
- Liquid chemical waste – battery acid, paint, etc.
- Solid chemical waste – dry batteries, fluorescent lights, etc.
- Electronic waste (e-waste).
- Biomedical waste.
- Ozone depleting substances (ODS) – refrigerants, fire suppressants, etc.
- Compressed gas cylinders.

5.2 APPROVAL

Any and all controlled or non-controlled products which have an external material safety data sheets (MSDS) shall be reviewed and authorized prior to use at any Baffinland. New product requisitioners are required to complete a product approval form which shall be reviewed by the Health & Safety and Environment Departments. Product assessment is based on such aspects as better alternative products, high potential for permit violation, and storage requirements. The MSDS Approval and Management Procedure (BAF-PH1-810-PRO-0025) is in Appendix D.

5.3 DELIVERY

All hazardous materials will be delivered to site by commercial carriers in accordance with the requirements of the Canadian Transportation of Dangerous Goods Act (TDGA). Carriers will be licensed and inspected as required by the Department of Transportation. All required permits, licences, and certificates of compliance are the responsibility of the carrier. All shipments must be properly identified and placarded. Shipping papers must be accessible and include information describing the substance, immediate health hazards, fire and explosion risks, immediate precautions, fire-fighting information, procedures for handling leaks or spills, first aid measures, and emergency response telephone numbers.

Each transportation company will be required to develop a spill prevention, control, and countermeasures plan to address the materials they are transporting. In the event of a release during transport, the commercial transportation company is responsible for first response and cleanup.

5.4 HAZARDOUS MATERIALS IDENTIFICATION AND HANDLING

Once dangerous goods are received at the workplace, additional regulations apply. The federal Workplace Hazardous Materials Information System (WHMIS) calls for the proper labelling of products, the availability of product information in the form of MSDSs, and employee education on how to identify and handle hazardous products. MSDS sheets of all hazardous materials are managed and available online at https://msdsmanagement.msdsonline.com/5d86feb8-bf67-4c18-8571-210396232abb/ebinder/?nas=True

In accordance with applicable Environmental Canada guidelines, tanks used for the storage of hazardous materials will be installed in secondary containment areas sized to hold at least 110% of the volume of the largest tank or will be certified double walled vessels.

Baffinland has prepared emergency response procedures for spilled chemical substances, as provided in the Spill Contingency Plan (BAF-PH1-830-P16-0036). These procedures outline the correct response to accidental spills or releases of hazardous materials to minimize health risks and environmental effects. Included are procedures for evacuating personnel, maintaining safety, cleanup and neutralization activities, emergency contacts, internal and external notifications to regulatory authorities, and incident documentation.

5.5 HAZARDOUS WASTE GENERATION AND HANDLING

Once used, residual hazardous material may become hazardous waste. Hazardous wastes include liquids or solids designated as hazardous wastes under either federal or provincial regulations, i.e. hydrocarbon liquids, used batteries, various chemicals used during concrete operations, coating materials and a wide variety of other materials including any containers, containing residual amounts of hazardous materials. More generally, chemicals or materials of unknown properties will be considered as a hazardous waste unless it can be shown otherwise.

Hazardous waste shall only be handled by trained workers and shall strictly follow the procedures set out in applicable standard operating procedures, job hazard assessments, and other relevant documents (e.g., the Environmental Protection Plan and environmental permits). The handling and disposal of hazardous waste shall comply with the appropriate legislation. A detailed list of hazardous wastes generated will be kept by Baffinland and updated periodically.

Hazardous waste shall be clearly labelled and at no time shall hazardous waste be combined with other solid non-hazardous waste. Spill kits shall be available inside the hazardous waste storage areas (refer to the Spill Contingency Plan, BAF-PH1-830-P16-0036, for requirements of spill kits). Should a hazardous waste spill occur Baffinland or its assigned representative will oversee its clean-up, removal of contaminated material, transportation and disposal of the hazardous waste contaminated material at an approved off-site hazardous waste disposal or treatment facility.

Any hazardous waste as listed in section 5.1 will be prevented from entering any water body.

There shall be no smoking within 10 m of the hazardous waste storage locations.

A special class of hazardous wastes are biological wastes generated at the medical clinic and first aid stations. While the amounts will be small, the nature of such waste requires separate packaging and disposal. Such waste will be packaged, labelled and transported for disposal to a facility licensed to dispose of such waste.

Waste Oil generated during the construction phase shall be properly handled, stored and disposed of according to Used Oil Control Regulations (82/02) and the Government of Nunavut, Department of Environment, Environmental Guideline for Used Oil and Waste Fuel (June 2012)

Material categories, site handling and storage requirements, and personal protective equipment for hazardous waste are summarized in TABLE 5-1.

TABLE 5-1: HAZARDOUS WASTE HANDLING REQUIREMENTS

Material	Handling Procedure
Liquid chemical waste (glycols, solvents, paint, brake fluid, hydraulic fluids, etc.)	Do not get in eyes, on skin, or on clothing. Avoid breathing vapours, mist, fume, or dust. Do not swallow. May be aspirated into lungs. Wear protective equipment and/or garments if exposure conditions warrant. Wash thoroughly after handling. Launder contaminated clothing before reuse. Use with adequate ventilation. Keep away from heat, sparks, and flames. Store in a well-ventilated area. Store in a closed container. Bond and ground during transfer.
Solid chemical waste (batteries, fluorescent lights, aerosol cans, etc.)	Avoid breathing vapours mist fumes and ensure they are stored in well-ventilated area. Store in an area away from direct sunlight and ensure containers are sealed at all times. Ensure no visible leaks or damage to containers holding the waste. Keep away from heat, sparks and flames. Use self-closing and flame resistant containers where possible.
Electronic waste (TVs, computer CRTs	Where possible Environmental Protection Act (EPA) encourages reuse and recycling of end-of life electronic waste. Dismantling and providing reuse possibilities, enables intact natural resources to be conserved and air and water pollution caused by

Material	Handling Procedure
(screens) and computer hard drives	hazardous disposal avoided. Sanitize before disposal and return to manufacturer where possible.
Laboratory chemical waste	Avoid contact with eyes skin clothing. Do not breathe dust or other vapours. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product. Store between 10° and 25°C. Keep away from: acids/ acid fumes. Oxidizers - Protect from heat moisture and ensure container lids are tightly closed at all times
Biomedical waste	Avoid eye contact. Use with adequate ventilation. Wash thoroughly after handling. Ensure waste is stored in areas away from general traffic and accessible only to authorized person. Follow label instructions. Avoid repeated skin contact. Store in cool, ventilated area. Keep container tightly closed. Waste cannot be stored for long periods and shall be transported in leak proof containers.
Ozone depleting substances (ODS) (i.e. refrigerants, etc.)	Should be permanently labelled with the quantity and type of ozone depleting substance contained within that equipment. Compressor rooms housing stationary refrigeration and air conditioning systems should have refrigerant detectors and alarms installed to detect refrigerant leaks and emissions. Ensure trained licensed personal.
Compressed gas cylinders	Do not smoke when handling or transporting these cylinders. Store cylinders in the upright position and secure with an insulated chain or non-conductive belt. Ensure that protective caps are in place and that the area is well ventilated. Protect cylinders from contact with ground, ice, snow, water, salt, corrosion and high temperatures. Storage areas for compressed gas cylinders must not contain any unnecessary combustible materials or uncontrolled ignition sources. Be aware that environmental conditions, such as heat exposure, may cause the temperature of the cylinder to rise to excessive levels that could lead to a release of product even if the ambient temperature is relatively low.

5.6 Hazardous Waste Temporary Storage On-Site

Hazardous wastes that will be generated on site will be of similar types during both construction and operations phases. These wastes will be temporarily stored in containers and/or at designated locations on site at the Mine Site and Milne Port.

Hazardous wastes generated from the temporary and permanent shelters along the Tote Road will be temporarily stored in containers at the shelter and subsequently temporarily stored at one of the designated on-site locations.

5.6.1 Hazardous Waste Containers

The following general waste storage requirements apply to most hazardous wastes:

- Store in original container when possible or in containers manufactured to store hazardous waste.
- Sound, sealable, undamaged containers.
- Store in 16 gauge (or lower) metal or plastic drums, or other appropriate container.
- Label according to WHMIS and TDG.

- Keep containers closed or sealed at all times unless in use.
- Protect containers from damage and weather.
- Store in secure area with controlled access.
- Train personnel in appropriate practices.
- Store in manner to prevent spills to environment.
- Never store with food or in food containers.

5.6.2 Hazardous Waste Storage Areas

The storage areas will abide by the following criteria:

- Storage areas for hazardous wastes will be located at a minimum distance of thirty-one (31) metres from the ordinary High Water Mark of any water body such that the quality, quantity or flow of water is not impaired.
- Storage areas for hazardous waste will be in lined and bermed facilities that will contain any spillage locally and prevent discharge to adjacent land and water.
- Drainage into and from the site is controlled to prevent spills or leaks from leaving the site and to prevent runoff from entering the site.
- Incompatible wastes are segregated by chemical compatibility to ensure safety of workers and facility.
- Only persons authorized to enter and trained in waste handling procedures have access to the storage area.
- Regular inspections are performed and recorded. Containers are placed so that each container can be inspected for signs of leaks or deterioration. Leaking or deteriorated containers will be removed and their content transferred to a sound container.
- A record is maintained of the type and amount of waste in the storage.
- Storage sites have emergency response equipment appropriate for the hazardous waste stored on the site.
- Storage site will be registered as required by regulations.

When a material becomes a waste it will then be stored and/or disposed of in accordance with specific government regulations and guidelines. Overall, hazardous waste treatment, recycling, and disposal facilities are lacking in Nunavut. Baffinland will therefore store most waste materials in secure facilities until they can be transported south for recycling or disposal.

TABLE 5-2 presents hazardous waste management method by waste material. TABLE 5-3 shows the estimated hazardous waste quantities onsite for the 2015 Work Plan.

TABLE 5-2: HAZARDOUS WASTE MANAGEMENT METHODS

Waste Material	Waste Type	Classification	General Management Method	Final Disposal
Absorbents – and other similar spill response material	Petroleum	Hazardous if used for a spill clean-up. Not TDG regulated.	Collect in white Quatrex bags. Store full bags in the hazardous waste storage areas until final disposal.	Offsite disposal
Activated Carbon	Petroleum	Hazardous. Not TDG regulated	Collect in white Quatrex bags. Store in the hazardous waste storage areasuntil final disposal.	Offsite disposal
Aerosol Cans	HHW	Hazardous. TDG regulated as "Aerosol, Flammable, Class 2.1, UN 1950"	Disposal bins located at various locations inside the main facilities, and at the waste management building. Store full drums in the hazardous waste storage areas in open top drums.	Offsite disposal
Appliances	Inert/ Chemical	May be hazardous.	Appliances may contain ozone depleting substances (refrigerator) or electronic boards. Manage accordingly. Store in contained location until approval by environment office to dispose in landfill.	Landfill
Batteries, wet (lead - acid)	Chemical	Hazardous. TDG regulated as "Batteries, wet, filled with acid, class 8, UN 2794"	Collect in black Quatrex bags in workplace sorting areas. Store full bags in the hazardous waste storage areas until final disposal.	Offsite disposal
Batteries, rechargeable (NiCad, Mercury, Lithium, Silver-Oxide)	HHW	Hazardous. Small household-type batteries are generally not TDG regulated.	Disposal bins (same as for alkaline batteries) are located at various locations inside the main facilities. Segregate per type and transfer to different 20L pails. Transfer to 20L pail, then in open top drums. Store in the waste berm. Computer batteries should be brought to the Environment Office.	Offsite disposal
Batteries, dry (alkaline)	HHW	Hazardous. Not TDG regulated.	Disposal bins (same as for rechargeable batteries) are located at various locations inside the main facilities. Transfer to 20L pail, then in open top drums. Store in the hazardous waste storage areas.	Offsite disposal
Biomedical Waste – Sharps, human anatomical, blood, and body fluids	Biomedical	Biomedical hazard.	Contain and store in suitable biohazard container at the medical office until disposal.	Offsite disposal
Calcium Chloride	Chemical	Hazardous. Not TDG regulated.	Collect and store in white Quatrex bags.	Offsite disposal or use as dust suppressant on roads (as authorized)

Waste Material	Waste Type	Classification	General Management Method	Final Disposal
Chemicals – spent lab reagents	Chemical	Hazardous. Shipping TDG instructions should follow MSDS recommendations.	Management method should follow MSDS recommendations.	Offsite disposal
Cigarette butts	Chemical	Hazardous. Not TDG regulated.	Collect in cigarette butts receptacles outside each main entrance.	Offsite disposal/ Incineration
Compressed gas cylinders	Chemical	Hazardous. TDG regulation varies depending on gas.	Safely empty cylinders of all gases. Store away from sources of heat and ignition. Return containers to manufacturer for reuse following TDG procedures. When not shipped offsite, remove valves and purge cylinder with compressed air or inert gas. Dispose of as metal.	Offsite reuse /Landfill
Contaminated Soils	Petroleum	Hazardous. Not TDG regulated	Store and decontaminate on site in landfarms	Onsite treatment
Contaminated snow, ice	Petroleum	Hazardous. Not TDG regulated	Store in contaminated snow dump adjacent to landfarm. Treatment in oil/water separator.	Onsite treatment
Contaminated water	Petroleum	Hazardous. Not TDG regulated	Collect in trays, drums, or pumped via pipeline. Store in closed top drums or bladders in the waste berm until treatment in oil/water separator.	Onsite treatment
Diesel fuel	Petroleum	Hazardous. TDG regulated as “Diesel, Class 3, UN 1202, FP 39°C”	Collect in trays, drums, or pumped via pipeline. Store in closed top drums in the hazardous waste storage areas until final disposal. Not a waste unless contaminated by a substance that makes it unusable as a fuel. Diesel not suitable as mobile fuel can be used for heating values.	Offsite disposal/ onsite recovery
Drums – empty	Petroleum	Hazardous. Not TDG regulated	Empty drums frequently contain residuals. Drain content of drum in adequate container. Crush and package drums on pallets.	Offsite disposal
Drums – residuals	Petroleum	Hazardous. Considered the same hazard as original product.	Drum residuals are to be collected in different containers for reuse (diesel, jet A, oil) or disposal (antifreeze or other product). Reuse diesel and oil for heating and other uses.	Onsite recovery/ Offsite disposal

Waste Material	Waste Type	Classification	General Management Method	Final Disposal
Electronic Equipment	HHW	Hazardous. Not TDG regulated. May contain heavy metals.	Typical electronic wastes consist of used computers, cell phones, cameras, TVs and monitor screens, media players, switches, and testing equipment. Electronic wastes shall be brought to the Environment Office. They are stored in contained location until offsite shipment for recycling. Batteries shall be removed of equipment and managed accordingly.	Offsite recycling
Fluorescent Lamps – bulbs and tubes	HHW	Hazardous in large quantities (trace amount of mercury). Not TDG regulated.	Bulbs disposal bins are located at various locations inside the main facilities. Repack in original or reused boxes. Store tubes in recycling container. Store in designated location until offsite shipment for recycling.	Offsite disposal
Filters – Lube oil	Petroleum	Hazardous. Not TDG regulated.	Drain and crush filters. Collect in open top drums and store in the hazardous waste storage areas.	Offsite disposal
Gasoline	Petroleum	Hazardous. TDG regulated as "Gasoline, Class 3, UN 1203, FP -39°C"	Collect in trays, drums, or pumped via pipeline. Store in closed top drums in the hazardous waste storage areas until final disposal. Not a waste unless contaminated by a substance that makes it unusable as a fuel.	
Glycol	Chemical	Hazardous. Not TDG regulated.	Collect in trays, drums, or pumped via pipeline. Store in closed top drums or 1000L tote tanks / cubes in the hazardous waste storage areas until final disposal.	Offsite disposal
Grease	Petroleum	Non-hazardous	Store in open top drums in the hazardous waste storage areas until final disposal.	Offsite disposal
Human Waste	Domestic	Hazardous. Not TDG regulated	Store in open top drums in the hazardous waste storage areas until final disposal.	Offsite disposal
Hydraulic fluid	Petroleum	Hazardous. Not TDG regulated.	Collect in trays, drums, or pumped via pipeline. Store in closed top drums in the hazardous waste storage areas until final disposal.	Offsite disposal
Incinerator Ash	Inert/ Chemical	Usually inert, if non-hazardous.	Composition of incinerator ash will depend on the wastes that were incinerated. Disposal in open top drums. Suitable for disposal in the landfill.	Landfill

Waste Material	Waste Type	Classification	General Management Method	Final Disposal
Jet A Fuel	Petroleum	Hazardous. TDG regulated as "Aviation gas, UN 1863, FP 39°C"	Collect in trays, drums, or pumped via pipeline. Store in closed top drums in the hazardous waste storage areas until final disposal. Not a waste unless contaminated by a substance that makes it unusable as a fuel. Jet A not suitable as aviation fuel can be used for heating values.	Onsite recovery/ Offsite disposal
Kitchen Grease/Oil	Domestic	Non-hazardous.	Collect in closed-top drums or 20L pails in a sea container outside the kitchen. Suitable for incineration or transport to PSC a week before backhaul for final disposal.	Incineration/Offsite disposal
Lube Oil	Petroleum	Hazardous. Not TDG regulated.	Collect in trays, drums, or pumped via pipeline. Store in 1000L tote tanks / cubes in the hazardous waste storage areas until final disposal. Possible reuse as heating oil or other uses in approved furnaces.	Offsite disposal/ Onsite reuse
Metal	Inert	Non-hazardous, inert waste	Collect and store in landfill bins.	Landfill
Methanol	Chemical	Hazardous. TDG regulated as "Methanol, Class 3, UN 1230, P.G. II"	Collect in UN certified container. Store in the hazardous waste storage areas.	Offsite disposal
Oily rags and similar debris	Petroleum	Not hazardous if used for cleaning. Classified as Absorbent if used to clean-up spills	Suitable for incineration. Collect in drums at workplace sorting areas. Bring to incinerator and disperse between waste loads.	Incineration
Ozone Depleting Substances (ODS, i.e. air conditioning and refrigerant gases)	Chemical	Hazardous.	ODS must be removed by certified technician before disposal of unit. ODS must be stored as per instructions from certified technician.	Offsite disposal
Paint	Petroleum	May be hazardous if oil based.	Collect in white Quatrex bags. Store in the hazardous waste storage areas until final disposal.	Offsite disposal
Plastics – oil/ hydrocarbon containers, contaminated berm liner	Petroleum	Hazardous. Not TDG regulated.	Drain fluid in appropriate cube or drum. Collect in white Quatrex bags. Store in the hazardous waste storage areas until final disposal.	Offsite disposal
Unusual waste	To be determined	To be determined	Bring to the Environment Office, if size permits. Proper management and disposal will be determined on a case-by-case basis.	To be determined

TABLE 5-3: ESTIMATED HAZARDOUS WASTE GENERATION PER ANNUM

Waste Category	Waste Description	Disposal Method	2015 Est. Generation (kg/person/day)	Person Days On-Site	Est. Total Annual Production (tonnes)
Batteries	Misc.	Shipped off Site	0.125	215,350	27
Hydro Carbon Contaminated Material	Sludge, Absorbents, Oil Filters, etc.	Incinerated/ Shipped off Site	0.288		62
Waste Oil	Maintenance	On-site reuse/ Shipped off Site	1.732		373
Waste Fuels	Maintenance	On-site reuse/ Shipped off Site	0.129		28
Waste Grease	Domestic/ Maintenance	On-site reuse/ Shipped off Site	0.046		10
Waste Hazardous Liquids	Other, Paint, Oily Water	Shipped off Site	0.561		121
Waste Aerosol Canisters	Misc.	Shipped off Site	0.004		1
Contaminated Containers/ Solids	Various	Shipped off Site	0.447		96
Misc Hazardous Materials	Misc.	Shipped off Site	0.350		75
TOTAL					**793**

5.7 HAZARDOUS WASTE TRANSPORTATION OFF-SITE

Hazardous Wastes will be shipped to registered hazardous waste disposal facilities or to recycling depots as per the Basel Convention. Hazardous wastes will not go to community hamlets. Storage and shipping containers will have appropriate containment measures. Manifests will be prepared for materials shipped off-site and the receivers will be required to maintain chain of custody records. Shipping will be undertaken only by those trained in the Transportation of Dangerous Goods (TDG). Hazardous waste storage and handling areas will be routinely inspected for leaks, spills, and the implementation of appropriate containment measures.

Baffinland will maintain records of waste backhauled from the Mary River Project and confirmation of proper disposal through the use of Waste manifest tracking systems and registration with the Government of Nunavut, Department of Environment. These records will be made available upon request, to an Inspector or the Board.

5.8 EPP PROCEDURES RELEVANT TO THIS HAZARDOUS MATERIALS MANAGEMENT PLAN

TABLE 5-4 outlines the Environmental Protection Plan (EPP) (BAF-PH1-830-P16-0008) procedures that are relevant to the Hazardous Materials Management Plan. The EPP is a living document and is subject to on-going updates.

TABLE 5-4: CONTENT OF THE EPP RELATED TO THE HAZARDOUS MATERIALS MANAGEMENT PLAN

Section	Title/Description
2.5	Geotechnical Drilling Operations
2.6	Equipment Operations
2.7	Fuel Storage and Handling
2.14	Solid Waste Management
2.15	Sewage Treatment
2.16	Hazardous Waste Management
2.17	Road Construction and Borrow Development
2.19	Road Traffic Management
2.21	Exploration Drilling Operations
3.7	Off-Site Waste Disposal Log

6 ROLES AND RESPONSIBILITIES

6.1 ENVIRONMENTAL RESPONSIBILITIES

The Baffinland Environmental Team is organized into two parts, on site as well as off site. The organisational structure for the Mary River Project in relation to the environment discipline is shown in the TABLE 6-1 below. Communication channels are described as liaisons in the tables outlining the responsibilities and accountabilities in the following sections.

6.1.1 ENVIRONMENTAL PROJECT TEAM

6.1.1.1 The Baffinland Environmental Team

The Baffinland Environmental Team will oversee all environmental and community works on and off site. The Baffinland Corporate Environmental Team responsibilities are summarized in TABLE 6-1.

TABLE 6-1: BAFFINLAND IRON MINES CORPORATION SENIOR MANAGEMENT

Baffinland Iron Mines Corporation Senior Management	
Position	**Responsibilities and Accountabilities**
Project Director	- Reports to Baffinland's CEO - Overall accountability for the Project execution - Allocation of resources (human and financial) for the implementation of Baffinland's commitments and objectives related to health, safety and environment during construction of the Project - Accountable for on-site environmental, health and safety performance during construction of the Project
VP Operations	- Reports to Baffinland's CEO - Overall accountability for the operation of the Project - Allocation of resources (human and financial) for the implementation of Baffinland's commitments and objectives related to health, safety and environment during operation - Accountable for on-site environmental, health and safety performance during operation
VP Sustainable Development, Health, Safety and Environment	- Reports to Baffinland's CEO - Establish corporate environmental policies and objectives - Monitors and reports on Baffinland's performance related to environmental, health and safety policies and objectives - Community liaison - Liaise with regulatory authorities - Obtains necessary permits and authorizations - Monitors compliance with terms and conditions of permits and licences - Routine EHS audit of contractor performance while on site
Manager Purchasing and Contract	- Reports to Baffinland's Project Director - Accountable for procurement and purchasing - Ensure that environmental commitments, policies and objectives are included in all contract documents

Baffinland Iron Mines Corporation Senior Management	
Position	**Responsibilities and Accountabilities**
VP Corporate Affairs	- Reports to Baffinland's CEO - Accountable for external communication (Governments, media, NGO, others) related to Baffinland's press release and overall communication of site incidents/events

The Baffinland Environmental Team will oversee all environmental activities on site. These responsibilities on site are outlined in TABLE 6-2.

TABLE 6-2: BAFFINLAND IRON MINES CORPORATION ON-SITE ENVIRONMENTAL TEAM

Baffinland Iron Mines Corporation On-Site Environmental Team	
Position	**Responsibilities and Accountabilities**
Environmental Manager	• Reports directly to VP Sustainable Development, Health, Safety and Environment and Indirect reporting and coordination with Operations VP and Director Environment • Overall accountability for environmental staff and performance at site • Coordinates implementation and monitors the performance of the Environmental Management System at site • Liaises with the senior management, regulators and stakeholders • Ensures effective monitoring and auditing of environmental performance of departments and contractors on site and identifies opportunities for improvement • Monitors compliance with permits, licenses and authorizations • Ensures all regulatory environmental monitoring and reporting requirements (monthly, annual) are met • Leads and coordinates site permitting requirements. • Initiates and oversees environmental studies • Oversees investigations and reporting of environmental incidents to regulatory bodies, stakeholders and senior management • Reviews and updates environmental management plans
Environmental Superintendent	• Reports to Environmental Manager • Specific accountabilities for environmental monitoring and reporting • Leads investigations and reporting of environmental incidents onsite • Serves as the liaison for regulators during onsite inspections and visits • Provides ongoing environmental education and environmental awareness training to all employees and contract workers • Oversees environmental database management • Prepares updates for management plans
Environmental Coordinator	• Reports to the Environmental Superintendent and Manager • Specific accountabilities for environmental monitoring and reporting • Provides day to day direction to Environmental staff onsite • Serves as a liaison for regulators during onsite inspections and visits. • Provides ongoing environmental education and environmental awareness training to all employees and contract workers • Assists with environmental database management
Environmental Advisor	• Reports to the Environmental Superintendent and Manager • Specific accountabilities for environmental monitoring and reporting

Baffinland Iron Mines Corporation On-Site Environmental Team	
Position	**Responsibilities and Accountabilities**
	• Assists with environmental database management • Prepare updates for management plans
Environmental Monitor and Technician	• Reports to the Environmental Superintendent or designate • Assists with environmental database management • Assists with monitoring and sampling activities as per the Project's management plans
QIA Monitor	• Works alongside the Baffinland Environment Department to ensure the proper implementation of all environmental management and monitoring plans • Acts as the QIA liaison for onsite environmental matters
Environmental Support Groups (Consultants, etc.)	• Assists with sampling, monitoring and reporting activities as required by permits, licenses and environmental management plans • Provides technical expertise to various environmental studies

6.1.2 MARY RIVER PROJECT ORGANIZATIONAL CHARTS

For further information regarding the Mary River Projects organizational structure in relation to the environment discipline, please refer to the FIGURE 6-1 below:

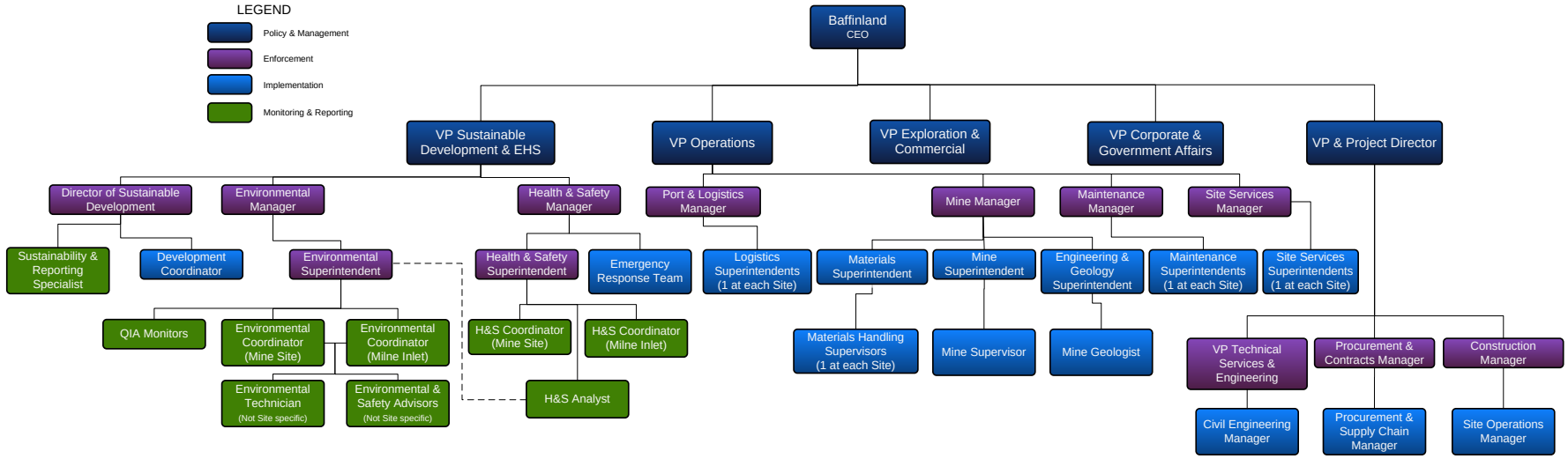

FIGURE 6-1: MARY RIVER PROJECT ORGANIZATION CHART

6.2 TRAINING AND AWARENESS

Staff and sub-contractors working on site will receive environmental training as part of the Site Orientation, to achieve a basic level of environmental awareness understanding of their obligations regarding compliance with regulatory requirements, commitments and best practices.

Operations superintendents and contractor supervisors will be provided with this Management Plan as necessary, and will receive additional orientation with respect to the requirements outlined in this Plan. In addition, all supervising level staff and sub-contractors will be provided with the Operational Standards (found in the Environmental Protection Plan) as a written guidance for their work.

Targeted environmental awareness training will be provided to both individuals and groups of workers assuming a specific authority or responsibility for environmental management or those undertaking an activity with an elevated high risk of environmental impact. These will be delivered in the form of toolbox/tailgate meetings or other means as appropriate.

The content of the environmental component of the site induction will include at a minimum:

- Location of environmental sensitivities.
- Location of additional information on environmental matters.
- Due diligence responsibilities.
- Responsibilities related to waste management, minimizing noise as necessary, road traffic rules, etc.
- Principles and necessary steps to avoid encounters with bears or other wildlife and what to do if one such encounter occurs.

With respect to hazardous materials management, Baffinland will adopt a training and awareness plan which will consider:

- The differing level of risks and potential consequences associated with different types of hazardous materials.
- The different responsibilities, abilities, and literacy of employees.
- The culture of the employees.
- Contractors involved and their relevant experience/expertise.
- The trainers, training methods, and settings.
- Training frequency.
- Documentation of training and evaluation of training.

Baffinland will regularly review and update the training and awareness plan based on changes in training needs and regulatory required training.

6.3 COMMUNICATION

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

- Formal written correspondence and meetings with stakeholders.
- Site visits by community representatives.
- Design, construction and planning meetings.
- Field inspections and monitoring reports disseminated by the Environmental Manager.
- Electronic communications.
- Tailgate/toolbox meetings.
- Formal written correspondence and meetings with government regulatory bodies.
- Formal environmental awareness training.

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

6.4 EXTERNAL COMMUNICATIONS

Effective forms of communication include the proactive notification to external stakeholders of Project activity. Project activity updates will be provided to the communities of North Baffin through various means including regular meetings, public notices and radio announcements as appropriate. Baffinland will maintain Community Liaison Offices to assist in this regard.

6.5 CONSTRUCTION

During the construction phase of the Project, the Baffinland VP of Mine Operations and Site Managers will be responsible for implementing this Plan.

This Management Plan will be updated to take into account the numerous construction sites, and types of construction equipment utilized.

6.6 OPERATION AND CLOSURE

For the operations and closure phases, Baffinland will revise its organizational structure to reflect the realities of the operation. The Environmental Manager will be responsible for subsequent updates and implementation of the Plan.

7 PERFORMANCE INDICATORS, THRESHOLDS AND INCIDENT RESPONSE

Regular inspections of hazardous materials management facilities will ensure compliance with this Hazardous Materials Management Plan. The Environmental Protection Plan (BAF-PH1-830-P16-0008) and associated operations procedures/work instructions outline detailed procedures for handling and storage of fuel, lubricants and other hazardous materials. These procedures are in place and training will be provided to employees and contractors on hazardous materials handling. Accidental spills are the most likely type of environmental incident to occur while conducting the above mentioned activities. Response procedures, documented in the Environmental Protection Plan (BAF-PH1-830-P16-0008), the Emergency Response Plan (BAF-PH1-830-P16-0007), and the Spill Contingency Plan (BAF-PH1-830-P16-0036), are in place to deal with these occurrences.

The ultimate performance indicator for hazardous materials management is the number of incidents of non-compliance reported on a daily or monthly basis. Incidents of non-compliance are classified by type and each type entails remedial actions as outlined in Hazard Identification and Risk Assessment Procedure (BAF-PH1-830-PRO-0001).

Where an investigation triggers a review and update of established Environmental Protection Plan (BAF-PH1-830-P16-0008) procedures, these reviews and update will be carried out in accordance the procedures established by Baffinland's EHS Framework.

8 MONITORING AND REPORTING REQUIREMENTS

8.1 HAZARDOUS MATERIALS MONITORING

Hazardous materials monitoring includes the visual inspection of three main components of the hazardous materials management system (described below) and the measurement and recording of hazardous materials taken off site. The following information will be reported on an annual basis as currently is the practice:

- The quantities hazardous materials transported off-site for disposal.
- The location and name of the disposal facility for each hazardous materials type.
- The date that each was hauled off-site for disposal, for each occasion that these are removed from the site.
- Quantities of non-hazardous inert solid hazardous materials disposed in the landfill.
- Quantities of hydrocarbon contaminated soils and water processed in treatment facilities.

Regular visual inspection of hazardous materials management facilities will be conducted by the Environmental Manager, or designate, to ensure proper operation and adequate environmental/health and safety controls are in place.

Hazardous materials audits will be undertaken periodically generation points to ensure hazardous materials streams are properly segregated.

Landfarm monitoring on the Project will be done in accordance to Appendix C.

8.2 OPERATIONS MONITORING

In addition to specific monitoring and reporting requirements under the regulatory approvals such as the water license, QIA Commercial Lease, land use permits, and fisheries authorization as well as monitoring of Project effects, the Environmental Manager, or designate will coordinate routine inspections of various aspects of the operations. Routine inspections are conducted to confirm overall conformance with the requirements of the Hazardous Materials Management Plan, companion Environmental Protection Plan (BAF-PH1-830-P16-0008), and operating procedures/work instructions, and will include inspections of site-based hazardous materials management activities.

Compliance Monitoring and/or Inspection Forms are used to document the findings and required actions. These reports are generated as an internal operational management tool to promote continuous improvement in environmental performance and stewardship. Checklists are used as internal operational monitoring and compliance tools. These checklists are integrated into the EPP and other operating procedures/work instructions.

8.3 DATA MANAGEMENT

The Environmental Manager is responsible for data management and reporting related to hazardous materials management. The data management system includes conducting routine inspections and monitoring, and providing these results to appropriate parties as required.

8.4 STAKEHOLDER REPORTING

Reporting of waste management activities will be included in the respective NWB and NIRB annual reports. In addition, interested stakeholders and the public may request detailed information as part of the Stakeholder Involvement Plan (BAF-PH1-830-P16-0025).

9 ADAPTIVE STRATEGIES

Baffinland is committed to continual improvement in its work activities with the aim of reducing risks to the environment and improving operational effectiveness. The strategy employed at Baffinland is regular monitoring supported by operational change and adoption of other mitigating measures if warranted.

Housekeeping and operational measures have been instituted. As part of the Environmental Protection Plan (BAF-PH1-830-P16-0008), work procedures will continuously be adapted with the goal to reduce the use of hazardous materials. Regular scheduled inspections of hazardous materials storage facilities along with the non-compliance reporting system described in Section 9 will ensure continual improvement and adaptation of hazardous materials management strategies throughout the life cycle of the Project.

As per the requirements of Baffinland`s EHS Management Framework, the company will conduct and document management reviews of its Hazardous Materials and Hazardous Waste Management Plan on a regular basis. Such reviews will ensure the integration of monitoring results for the Hazardous Materials and Hazardous Waste Management Plan are integrated with other aspects of the Project and that necessary adjustments are implemented as required. These reviews also provide a formal mechanism to assess the effectiveness of the management in achieving the company's objectives and maintaining on-going compliance with Project permits and authorizations.

10 QA/QC

As per the requirements of Baffinland's EHS Framework Standard (BAF-PH1-830-STD-0001), regular audits will be undertaken to ensure compliance with the current Hazardous Materials and Hazardous Waste Management Plan and that best management practices are implemented for hazardous materials management. The result of these audits will form the basis for an annual written statement of assurance by management on the effectiveness of its Hazardous Materials and Hazardous Waste Management Plan.

11 REFERENCES

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Environment and Natural Resources. Guidelines for the Management of Biomedical Hazardous materials in the Northwest Territories. April 2005.

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Northwest Territories (NWT). Municipal and Community Affairs. Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories.

Prepared by Kent, R., P. Marshall and L. Hawke. Yellowknife: Ferguson Simek Clark, (April 21) 2003.

Appendix A -
2015 Work Plan and Updated Site Layout Drawings

- Please refer to the 2015 Work Plan submitted to the NWB and QIA on October 31, 2014. Subsequently, an addendum to that Work Plan was submitted on December 12, 2014.
- Included here are the updated Site Layout Drawings as submitted with the Addendum to the Work Plan

H349000-2000-00-015-0021

MILNE INLET

AANDC NUNAVUT LEASE 47H/16-1-2

SHIPLOADER

ORE DOCK

MOORING BUOY

SEALIFT BARGE LANDING AREA

RAMP TO BEACH

LAYDOWN AREA

FUEL TANK FARM

ORE STOCKPILE SETTLING PONDS

EFFLUENT DISCHARGE LOCATION
N 7976341
E 503639

HAZARDOUS WASTE BERMS

LAYDOWN AREA

EXISTING HTO CABIN

FUTURE AIRSTRIP

SERVICES AREA PAD
SITE FACILITIES, INCLUDING:

- MAINTENANCE BUILDING x 2
- EXTEND WELDING SHOP BUILDING
- WORKSHOP OFFICE BUILDING
- TOROMONT MAINTENANCE BUILDING
- TRUCKWASH

POWER GENERATORS

INCINERATOR HAZARDOUS WASTE BERM

POLISHING WASTE STABILIZATION POND

ORE STOCKPILE PAD

EXISTING HAZARDOUS WASTE BERM

CAMP INFRASTRUCTURE PAD
SITE FACILITIES, INCLUDING:

- EXTEND ACCOMMODATION COMPLEX
- EMERGENCY RESPONSE OFFICE
- EMERGENCY RESPONSE GARAGE
- UPGRADE SEWAGE TREATMENT PLANT
- UPGRADE POTABLE WATER TREATMENT PLANT
- WASTE MANAGEMENT FACILITY

MATRIX CAMP

TRAILER CAMP TO BE REMOVED 2015

ADDITIONAL LAYDOWN AREA

LAND FARM

ROCK QUARRY N0.1 BOUNDARY

PHILLIPS CREEK

POTABLE WATER SUPPLY

CONCRETE BATCH PLANT , CRUSHER AND STOCKPILE

FUTURE POLISHING WASTE STABILIZATION POND

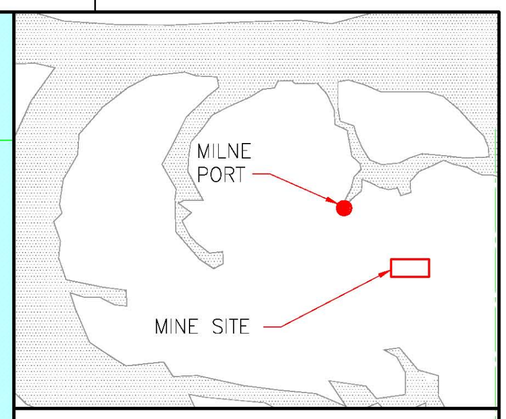
TOTE ROAD

EXTENT OF QUARRY Q1

PERMITTED OPEN BURN PIT AREA

KM2 PLANNED BORROW AREAS

KEYPLAN



FOR INFORMATION

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. DRAINAGE WILL BE DIVERTED AROUND NEW LAYDOWN AREAS AND PADS.

0 50 100 150 200 250
SCALE IN METRES

LEGEND:

- WATER
- QUARRY
- COMMERCIAL LEASE
- AANDC LEASE 47H/16-1-2
- RIVER/STREAM/DRAINAGE
- ROAD
- PROJECT DEVELOPMENT AREA
- PLANNED BORROW AREAS

REV.	ISSUE FOR	AUTH. BY	DATE
C	ISSUE FOR USE	S.M.	T.M. 2014-12-10
B	ISSUE FOR USE	C.L.	T.M. 2014-10-31
A	ISSUE FOR USE	C.L.	A.G. 2014-06-19

ISSUE AUTHORIZATION

HATCH™

DESIGNED BY C. LEISTNER DATE 2014-10-20	DRAWN BY J. BAJAGIC DATE 2014-10-20
CHECKED BY S. POTTER DATE 2014-10-20	DISCIP. ENGR. A. GRZEGORCZYK DATE 2014-10-20
PROJ. DES. COORD. T. THERTELL DATE 2014-10-20	PROJ. ENGR. J. CLELAND DATE 2014-06-19
PROJ. MGR. J. CLELAND DATE 2014-06-19	

Baffinland

MARY RIVER PROJECT

MILNE PORT
INFRASTRUCTURE FOOTPRINT
WORK PLAN 2015

SCALE 1:5000 OR AS NOTED

DWG. NO. H349000-2000-00-015-0021

REV. C

DWG. NO. H349000-4000-00-015-0021

TOM RIVER

KNOLLS TO BE REMOVED FOR AVIATION SAFETY

STORAGE AREA

HAZARDOUS WASTE CONTAINMENT BERM (EXISTING)

BARRELED FUEL LINED CONTAINMENT

WASTE MANAGEMENT BUILDING

HAZARDOUS WASTE CONTAINMENT AREA NEW

LAYDOWN AREA

CONCRETE BATCH PLANT

RAW WATER PUMP HOUSE

WAREHOUSE

QUARRY QMR2

RAW WATER INTAKE PIPELINE

CONSTRUCTION LAYDOWN AREA

CAMP LAKE

Km 97 BORROW SOURCE

EXPLORATION TENT CAMP

EXPLORATION SOFT-WALL CAMP

HELIPAD

EXISTING POLISHING WASTE STABILIZATION PONDS (PWSPs)

RAW WATER INTAKE PIPELINE

WASTE WATER TREATMENT FACILITY

EXPLORATION WORKSHOPS

AERODROME APRON AND FUEL STORAGE

AERODROME RUNWAY

EXPLORATION CAMP SEWAGE PIPELINE

SHEARDOWN NW LAKE

UTILITIES, INCLUDING:

- UPGRADE POWER GENERATION MODULE (B)
- SEWAGE TREATMENT PLANT (B)
- UPGRADE POTABLE WATER TREATMENT PLANT (B)
- BULK FUEL STORAGE FACILITY

LANDFILL AND LANDFARM

EMULSION PLANT

ORE CRUSHING SEDIMENTATION POND

EFFLUENT DISCHARGE POINTS No.1, No.2 & No.3

WASTE ROCK DUMP BOUNDARY AT THE END OF OPERATION

FUTURE WASTE ROCK SEDIMENTATION POND

FUTURE WASTE ROCK DUMP

DEPOSIT NO.1 MINING LEASE 2484

PROPOSED OPEN PIT OUTLINE

OPEN PIT DEVELOPMENT

CAMP INFRASTRUCTURE:

- EXTEND ACCOMMODATION COMPLEX (B)
- EMERGENCY RESPONSE
- MEDICAL CENTRE

PIT OFFICE

QUARRY D1Q1

SITE SERVICE FACILITIES, INCLUDING:

- MAINTENANCE BUILDING
- WELDING SHOP
- TRUCKWASH (B)
- TOROMONT BUILDING
- ORE HAUL WORKSHOP (B)
- ORE HAUL TRUCKWASH (B)

QUARRY D1Q2

TRUCK WEIGH SCALE BUILDING

PIT 1 HAUL ROAD

KM 104 QUARRY

EXPLOSIVE MAGAZINE

EXTEND ORE CRUSHING AND LOADING PADS

MARY RIVER

0 200 400 600 800 1000

SCALE IN METRES

MILNE PORT

MINE SITE

KEYPLAN

FOR INFORMATION

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. DRAINAGE WILL BE DIVERTED AROUND NEW LAYDOWN AREAS AND PADS.

LEGEND:

- WATER
- QUARRY
- ROAD
- PLANNED BORROW AREA
- EXISTING ROCK QUARRY
- RIVER/STREAM/DRAINAGE
- RAW WATER INTAKE PIPELINE
- COMMERCIAL LEASE
- PROJECT DEVELOPMENT AREA

REV.	ISSUE FOR	AUTH. BY	DATE
B	ISSUE FOR USE	S.M.	T.M. 2014-12-10
A	ISSUE FOR USE	C.L.	A.G. 2014-10-31

ISSUE AUTHORIZATION

HATCH™

DESIGNED BY C. LEISTNER DATE 2014-10-21	DRAWN BY J. BAJAGIC DATE 2014-10-21
CHECKED BY S. POTTER DATE 2014-10-21	DISCIP. ENGR. A. GRZEGORCZYK DATE 2014-10-21
PROJ. DES. COORD. T. THERTELL DATE 2014-10-21	PROJ. ENGR. J. CLELAND DATE 2014-10-21
PROJ. MGR. J. CLELAND DATE 2014-10-21	

Baffinland

MARY RIVER PROJECT

MINE SITE
INFRASTRUCTURE FOOTPRINT
WORK PLAN 2015

SCALE 1:15000 OR AS NOTED

DWG. NO. H349000-4000-00-015-0021

REV. B

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

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Appendix B - Table of Concordance with Applicable Permits and Licences

Table C-1 shows the Part, number and Condition of the Type A water License (Water Licence No: 2AM-MRY1325) and the location where the condition is located within the Hazardous Materials and Hazardous Waste Management Plan.

TABLE B- 1: CONCORDANCE TABLE WITH TYPE A WATER LICENCE (2AM-MRY1325) CONDITIONS

Part	Number	Condition	Section
D	20	The Licensee shall prevent any chemicals, fuel or wastes associated with the undertaking from entering any Water body.	Section 5.5
F	5	The Board has approved with the issuance of the licence, the Plan entitled "Baffinland Iron Mines Corporation Mary River Project Hazardous Materials and Hazardous Waste Management Plan", dated April 22, 2013.	N/A
F	6	The Licensee shall locate areas designated for waste disposal at a minimum distance of thirty-one (31) meters from the ordinary High Water Mark of any water body such that the quality, quantity or flow of water is not impaired, unless otherwise approved by the Board in writing.	Section 5.6.2
F	11	The Licensee shall submit to the Board and the Inspector, thirty (30) days prior to the removal and transfer of waste, a declaration of authorization from any community receiving waste from the project, which clearly states that authorization has been granted for the deposit by the Licensee at the Hamlet's appropriately licensed facilities.	Section 5.7
F	14	The Licensee shall remove any waste generated from temporary and permanent shelters along the tote road and along the railway corridor for treatment at appropriately licenced Waste Management Facilities.	Section 5.6
F	29	The Licensee shall remove from the project site, all hazardous wastes generated through the course of the Construction and Operations Phases, for disposal at an approved Waste Disposal Facility.	Section 5.6
F	30	The Licensee shall maintain records of all Waste backhauled from the Mary River Project and confirmation of proper disposal through the use of Waste manifest tracking systems and registration with the Government of Nunavut, Department of Environment. These records shall be made available upon request, to an Inspector or the Board.	Section 5.7

TABLE B- 2: CONCORDANCE TABLE WITH TYPE B WATER LICENCE (2BE-MRY1421) CONDITIONS

Part	Number	Condition	Section
D	6	The Licensee shall backhaul and dispose of all hazardous wastes, waste oil and non-combustible waste generated through the course of operation at a licensed waste disposal facility.	Section 5.5
D	6	The Licensee shall maintain records of all waste backhauled and records of confirmation of proper disposal of backhauled waste. These records shall be made available to an Inspector or the Board upon request.	Section 5.7

TABLE B- 3: CONCORDANCE TABLE WITH TYPE B WATER LICENCE (8BC-MRY1416) CONDITIONS

Part	Number	Condition	Section
D	7	The Licensee shall backhaul and dispose of all hazardous wastes, waste oil and non-combustible waste generated through the course of the operation at a licensed waste disposal site.	Section 5.5
D	8	The Licensee shall maintain records of all waste backhauled and records of confirmation of proper disposal of backhauled waste. These records shall be made available to an Inspector upon request.	Section 5.7
D	9	The Licensee shall notify the Inspector and the Board of any contaminated soils, water or waste that is generated under this Licence and stored at any facility constructed under this Licence or by means that is regulated under Licence 2AM-MRY1325 for future disposal. This information shall be reported within the annual report required by Part B, Item 4.	Section 8.1

Appendix C -
Landfarm Operation and Monitoring Manual

(Document #: BAF-PH1-320-T07-0005)

Baffinland Iron Mines Corporation

Landfarm Operation Maintenance and Monitoring Manual

BAF-PH1-320-T07-0005

Rev 0

Prepared By: Trevor Myers
Department: Environmental
Title: Environmental Superintendent
Date: March 18, 2015
Signature:

Approved By: Bikash Paul
Department: Site Services
Title: Site Services - Manager
Date: March 18, 2015
Signature: for

DOCUMENT REVISION RECORD

Issue Date MM/DD/YY	Revision	Prepared By	Approved By	Issue Purpose
03/18/15	0	TM	BP	Use

TABLE OF CONTENTS

1 PURPOSE AND SCOPE

The purpose of this manual is to outline and prescribe Standard Operating Procedures to ensure that Baffinland Iron Mine's Milne Port landfarm facility is operated in an efficient manner that is consistent with Baffinland's commitments to health, safety and environmental protection.

This manual has been designed to be used as a field reference document and training manual for classroom and self-instruction purposes. All employees with accountabilities and responsibilities as outlined in this manual are expected to be familiar with its use and location at the site. This manual contains the basic knowledge regarding responsibilities, environmental protection measures and regulations, safety practices and overall procedures for operating the Milne Port landfarm facility.

2 REQUIREMENTS

2.1 HAZARDS AND ADDITIONAL PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following section provides the hazards, personal protective equipment (PPE), and safety and environmental equipment requirements associated with landfarm facility operation and maintenance activities.

2.1.1 HAZARDS

There are numerous hazards associated with the operation and maintenance of the landfarm. They include:

- Equipment collision or rollover
- Flying dust and small particles
- Petroleum hydrocarbon (PHC) vapor inhalation
- Spills

2.1.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Wear Standard P.P.E. - Safety glasses, hard hat, safety boots and reflective vest[1].
- Optional - Respirator fitted with an organic vapor cartridge(s) when dealing with heavily contaminated soils or when unusually high levels of hydrocarbon vapor may be present.

2.1.3 SAFETY AND ENVIRONMENTAL EQUIPMENT

- Spill kits (at landfarm and on mobile equipment)
- Radio Communication
- Optional - Gas monitor (for air quality testing)

[1] PPE is not required for operators inside enclosed cabs of heavy equipment.

2.2 Training, Qualifications and/or Certification

Any operator who may be working at the landfarm shall complete the documented training in this procedure and demonstrate their understanding of their responsibilities, and of the hazards and controls. Verification of training will be kept by the Training Department.

3 RESPONSIBILITES

The following roles have specific accountabilities that must be met to ensure the Milne Port landfarm facility is operated in compliance with this manual. The following roles and responsibilities have been assigned to site personnel required to complete landfarm facility operations; however, this may not include all duties required to safely and successfully operate the facility.

3.1 Site Services Manager/ Superintendent

The Site Services Manager, or the Site Services Superintendent in the Manager's absence, is accountable for the overall operation of the landfarm facility. Specifically, he/she shall:

a. Implement and enforce this procedure.
b. Plan and coordinate the use of the landfarm facility to conserve space and optimize remediation efficiency;
c. Assist in the development, implementation and enforcement of landfarm specific safety protocols;
d. Meet routinely with the Site Services Supervisor(s) to maintain proper control of the site and identify existing or anticipated problems considering the following:
    i. Operational issues;
    ii. Regulatory Requirements;
    iii. Equipment issues; and
    iv. Special operating instructions; e.g., inclement weather, repairs, fertilizer addition, etc.
    e. Schedule routine work as required (e.g., snow removal, tilling and spreading, irrigation, etc.);
f. Ensure that the need for any special operating conditions are identified and planned for in advance. This may include the identification of features (e.g. stockpiles) with stakes in advance of winter and the ground freezing;
g. Coordinate a biannual summer earthworks inspection which shall be conducted by a geotechnical engineer.

3.2 Site Services Supervisor

The Site Services Supervisor, under the supervision of the Site Services Manager/Superintendent, is responsible for supervising all activities at the landfarm facility in accordance with this manual. Specifically, the Site Services Supervisor shall:

a. Implement this procedure;
b. Regularly brief the Site Services Manager/Superintendent on the status of routine operations and any potential issues;

c. Ensure that soils under remediation are spread evenly to a soil depth determined to optimize hydrocarbon degradation rates;
d. Maintain thorough, accurate and detailed records of landfarm operations and additional requirements as determined;
e. Provide timely response to incidents and inquiries to ensure the landfarm is operated in compliance with this procedure;
f. Inspect and organize the landfarm facility layout;
g. Direct site users to the proper stockpiles or dumping area according to the incoming soils' contaminant type;
h. Perform all the duties of the landfarm Operator/Labourer in his/her absence;
i. Restrict access to landfarm facility, closing and locking gate after use or as required.

3.3 Landfarm Operator/ Labourer

The Landfarm Operator/Labourer, under the supervision of Site Services Supervisor, is responsible for executing the following tasks at the landfarm facility. Specifically the Operator/Labourer shall:

a. Be trained and experienced in operating the mobile heavy equipment necessary for the work;
b. Work in conjunction with the Site Services Supervisor in executing general facility operations according to this procedure;
c. Prepare landfarm facility for summer treatment operations prior to freshet (e.g. snow removal, etc.);
d. Apply water and/or nutrients to remediating soil under the direction of the Site Services Supervisor and the guidance of the Environment Department;
e. Inspect incoming contaminated soils and direct site users to proper stockpiles according to contaminant type; and
f. Assist the Environment Department in treating water collected in the facility sump and contaminated snow containment.
g. Report all violations of site user rules (Attachment A) to their supervisors for further action and incident reporting.

3.4 Environment Department Personnel

To ensure all employees and contractors are following the guidelines outlined in this manual, the Environment Department will conduct biweekly inspections of the Milne Port landfarm facility. In addition to conducting inspections, Environment personnel shall:

a. Provide guidance to site personnel with regards to acceptable soils at the landfarm;
b. Assist Site Services in optimizing soil remediation rates by monitoring parameters including:
    i. Soil characteristics; grain size, soil texture, bulk density, moisture content and permeability;
    ii. Residual petroleum hydrocarbon concentrations;
    iii. Soil chemistry; nutrients, salts, pH; and
    iv. Tilling frequency.
c. Sample remediating soils throughout summer treatment season to monitor remediation progression;
d. Assist Site Services in the treatment of water collected in the landfarm sump and contaminated snow containment;

e. Identify treated soils that meet remediation objectives and are acceptable for reintroduction to the environment;
f. Liaise with regulators and stakeholders on matters related to landfarm operations (e.g. notification of planned reintroduction of remediated soil to the environment);
g. Install groundwater wells and monitor groundwater quality along the perimeter of the landfarm facility; and
h. Audit record keeping associated with landfarm facility operations.

4 DEFINITIONS

Landfarm: Bioremediation treatment facility that uses naturally occurring microorganisms (mainly aerobic) and soil aeration (tilling) to remediate soils impacted by petroleum hydrocarbon (PHC) spills.

Contact Water: All irrigation water, precipitation and snowmelt that collect within the landfarm sump.

5 PROTOCOL

5.1 Facility Design, Locations and Layout

The Milne Port landfarm facility was designed in accordance with Environment Canada's Federal Guidelines for Landfarming Petroleum Hydrocarbon Contaminated Soils to ensure both the protection of the environment and the health and safety of all personnel. It is located north of Milne Port Quarry 1 (MP-Q1) along the former Tote Road access. The facility consists of two containments, a landfarm containment and a contaminated snow containment (figure 1):

- The layout of the landfarm consists of a lined, containment area for stockpiling and remediating contaminated soils, a sump in the southwest corner for contact water collection and a ramp in the southeast corner for transporting soils in and out of the facility. It is designed to accommodate approximately 3,383 m3 of contaminated soils.
- Located on the east side of the landfarm, the contaminated snow containment is designed to store contaminated snow and ice generated from spills during the winter months. It is designed to hold 929 m3 of snow and ice (assuming a freeboard of 30 cm) and is accessed by a ramp on the south side.

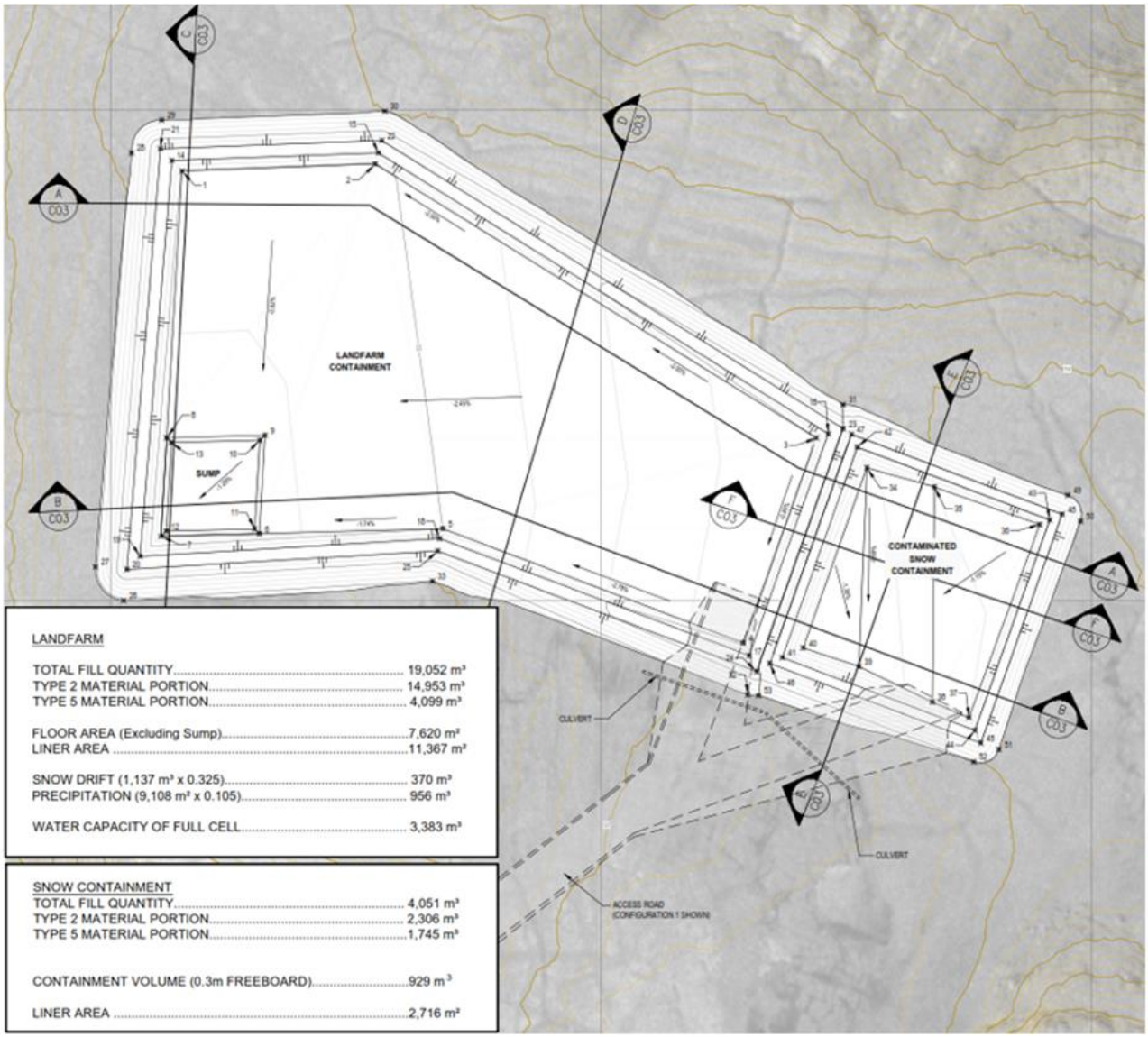

Figure 1 – Landfarm and Contaminated Snow Containment Facility

5.2 Acceptable Soil Criteria

- Impacted soils destined for the landfarm shall be inspected to ensure the material is acceptable for treatment.
- All hydrocarbon contaminated soils are accepted at the landfarm (e.g. diesel, Jet-A, hydraulic oil).

- In case of major hydrocarbon spills or spills of unknown substance, soils should be sampled prior to being introduced in the landfarm and should meet the following chemical acceptability criteria[2] :
  - Total PHCs less than 4%;
  - Electrical conductivity <4 dS/m; sodium adsorption ratio (SAR) <6;
  - pH greater than 5 and less than 10; and
  - CCME metals up to Tier 1 values or up to natural background concentrations
- Salts contaminated soil shall not be deposited in the landfarm. They may be harmful to biodegradation in high concentrations.
- Rock fragments and cobble exceeding 100 mm (4 in.) in diameter shall not be deposited at the landfarm. They have the potential to damage the containment liner during tilling.
- Acceptable soil types and criteria shall be posted at the entrance of the facility and the unloading or stockpiling area.

5.3 Acceptable Snow Criteria

- Hydrocarbon contaminated snow and ice shall be deposited in the contaminated snow containment.
- Sewage contaminated snow and ice shall not be deposited in the snow containment. It should be deposited in the Milne Port Polishing Waste Stabilization Ponds (PWSPs).

5.4 Stockpiling

- Soils should be separated into stockpiles according to contaminant type.
- Each stockpile shall be clearly labelled with signage in order to direct trucks unloading contaminated material to the proper location at the facility.
- The Landfarm Operator/Labourer shall ensure that adequate signage and barricades are in place at the required locations at the beginning of each day and relocate signs and barricades as required at the end of each day.

5.5 Cell Development, Soil Thickness and Tilling

- **Cell development:** Soil should be tilled as it is spread, continuing until all of the intended soil has been deposited to ensure that the material is well-mixed and aerated.
- **Soil thickness:** Remediating soil should have an approximate soil depth of 30 cm (12 in.) and should maintain a 2 m (6 ½ ft.) perimeter from the inside toe of the berm.

[2] These characteristics detail the optimal chemical composition of suitable landfill soils and will be used as a guideline in determining treatability of soils generated by spills.

- **Optimum soil condition:** Landfarm soil should be loose and moist. During the summer treatment season, the soils should be tilled every week. Optimizing the moisture content will enhance biodegradation and avoid dust generation.
- **Dry soil:** Very dry soils should not be tilled. The landfarm should be irrigated prior to tilling to increase the soil moisture content to 40% to 85% of the soils' water-holding capacity.
- **Wet soil:** Soils that are too wet should not be tilled. Passing equipment over wet or saturated soils could compact the material, reducing aeration and overall microbial activity. If soils appear muddy, or stick to the tracks of the tilling equipment, the soils are too wet to process.
- **Tilling equipment:** All tilling should be done with a plow pulled by a tracked skid steer to reduce soil compaction and optimize soil aeration. To avoid unnecessary soil compaction, only tilling equipment shall be permitted on remediating soil plots while actively tilling.

5.6 Water Management and Monitoring

5.6.1 Irrigation and Routine Operation

- **Sump water:** Contact water that accumulates in the sump from precipitation or snowmelt may be recycled as irrigation water to increase soil moisture or to supress dust within the landfarm area during dry periods.
- **Sheen:** Recycled water from the sump should not contain any PHC sheen. If a sheen is observed it should be removed with absorbents or avoided by drawing water from beneath the water surface.
- **External water requirements:** As per the Type A Water License No. 2AM-MRY1325, Part E, Item 5, MBR effluent or treated water from the Milne Port PWSP may be used to irrigate dry soil, if such waters meet their respective appropriate discharge criteria. Consumption of fresh water should be avoided.

5.6.2 Water Treatment and Discharge Criteria

- The level of contact water within the landfarm sump shall be monitored and maintained within the determined range during the summer months to maintain adequate freeboard and avoid flooding the soils undergoing treatment.
- Contact water should be drained prior to freeze-up in September.
- All water from the landfarm sump and contaminated snow containment pond shall be sampled and analysed prior to discharge to ensure the water quality meets the landfarm discharge criteria outlined in Baffinland's Type A Water License No. 2AM-MRY1325, Part F, Item 24, Table 9.
- All water that does not meet discharge criteria shall be treated using the onsite mobile Oily Water Treatment System (OWTS). All water sampling shall be conducted in accordance with Baffinland's Surface Water Sampling QA/QC Plan.

5.6.3 Groundwater Monitoring

- Groundwater monitoring wells shall be installed around the perimeter of the landfarm facility to ensure the structural integrity of the facility's containment liner throughout facility operations.
- Groundwater wells shall be sampled at a minimum of once annually, between mid-August and mid-September when groundwater monitoring becomes possible.
- All sampling groundwater sampling shall be conducted in accordance with Baffinland's Surface Water Sampling QA/QC Plan.

5.7 Soil Management and Monitoring

5.7.1 Remediation Objectives

- Remediation objectives for impacted soils shall be determined by the source of contamination and the subsequent use of the remediated soils.
- Tier 1 criteria for PHC and metals parameters will be used as a minimum to determine soil remediation objectives, as outlined in the Government of Nunavut Environmental Guideline for Site Remediation (2009), as per Baffinland's Type A Water Licence No. 2AM-MRY1325, Part J, Item 6.
- Analysis of additional parameters will depend on the source of contamination.

5.7.2 Soil Sampling and Analysis

- At the beginning of each summer treatment season, soils shall be evaluated for optimal nutrient, moisture and pH conditions.
- Soil sampling should be conducted throughout the treatment season to characterize soil additions from recent spills and monitor the progression of PHC degradation in soils undergoing remediation.
- Parameters may include soil bulk density, salts, moisture content, field capacity, and nutrients.
- All soil samples shall be collected using best industry practices and in accordance with the principles outlined in Baffinland's Surface Water Sampling QA/QC Plan.

5.7.3

- Any transport of soils out of the landfarm shall be preapproved by the Environment Department.
- The use of remediated soil for back fill or general site grading may be carried out only upon consultation and approval by the Government of Nunavut, Department of Environment and an Inspector, as per Baffinland's Type A Water License No: 2AM-MRY1325, Part J, Item 6.

5.7.4 Winter Management and Freshet Preparation

- **Winter management:** Contaminated soil can be stockpiled up to 5 m (5 yd.) to minimize the amount of contact precipitation.

- **Freshet preparation:** Snow and ice accumulated within the landfarm that has not come in contact with the underlying contaminated soil can be removed and placed outside the landfarm facility to melt.
- Approximately 10 cm (4 in.) of contact snow cover should remain on all surfaces during the snow removal process.
- If the landfarm soils are disturbed, contact snow should remain in the landfarm area and be deposited in the sump to melt.
- Snow accumulation within the sump area should be removed to within 10 cm (4 in.) of the ice surface.

5.8 Summary of Inspections and Reporting

Table 6.1 summarizes the documentation and due diligence required to ensure compliance throughout the landfarm operations. All site personnel responsible for completing landfarm facility operations shall be familiar with documentation and reporting requirements.

Table 6.1 – Monitoring Summary and Documentation

Item	Purpose	Responsible Party	Frequency	Type of Record(s)
General Operations	Record keeping of treatment operations	Site Services and Environment	Ongoing	• A working log detailing the following: - Dates, volumes (m^3) and source of soils entering and exiting facility - Start and end date of soils under remediation - Dates and volumes of contact water treated, discharged and recycled - Dates, volumes and source of soil amendment additions (e.g. wastewater effluent, fertilizer) • A current layout sketch identifying origin and contaminant type of remediating soils and stockpiles • Photographic record.
Soil Sampling	Characterization and acceptance at landfarm	Environment	As required (e.g. major spill, spill of unknown substance)	• Soils origin and associated spill report. • Field notes detailing sampling methodology, soil texture, moisture content, odor and suspected contaminants. • Laboratory-issued analysis reports including QA/QC and chain of custody. • Documentation of fate of rejected soils. • Record of any treatability tests done.

Item	Purpose	Responsible Party	Frequency	Type of Record(s)
Soil Sampling	Remediation Progress Monitoring Determination of amendment additions	Environment	Monthly during the frost-free months	• Field notes detailing sampling methodology, sample location and depth, soil texture, moisture content and odor. • Photographic record. • Laboratory-issued reports including QA/QC and chain of custody. • Summary tabulation of results. • Analysis of percent removal of PHC constituent treated and treatment time.
Soil Sampling	Verification of remediation	Environment	Once per year at the end of the season Otherwise, as circumstances require	• Field notes and sketch detailing sampling methodology, sample location and depth, soil texture, moisture content and odor. • Photographic record. • Laboratory-issued reports including QA/QC and chain of custody. • Summary tabulation of results. • Analysis of percent removal of PHC constituent treated and treatment time. • Documentation of fate of treated soils including date and volume (m^3).

Contact and Contaminated Water Sampling	Conformity to Water License requirements
	
	Remediation Progress Monitoring
		Environment	Monthly, or as required	• Document notification to Inspector (written notification at least 10 days prior to discharge).
				• Field notes detailing:
				  • Discharge start and stop times
				  • Date and time of samples taken
				  • Daily discharge volumes (m^3)
				  • Photographic record of OWTS setup
				• Laboratory-issued reports including QA/QC, chain of custodies and summary tabulation of results.

Groundwater Monitoring and Sampling	Groundwater quality assessment	Environment	At least once per year	• Laboratory-issued reports including QA/QC, chain of custodies and summary tabulation of results • Field notes detailing sampling methodology, date and time of sampling, depth of active layer, weather and condition of wells. • Trend analysis (after a minimum of four years of data, if applicable).
Construction Summary Report	As-built and construction report as per Water License.	Projects	Submit to Nunavut Water Board within 90 days of completion of construction	• Construction field notes and observations. • Record and as-built drawings. • Monitoring well installation details. • Summary of any geotechnical testing, compaction, moisture content, particle size analysis.

Item	Purpose	Responsible Party	Frequency	Type of Record(s)
Site Safety Inspections	Hazards identification	Health and Safety	Weekly	• Any unsafe condition/near-miss/incident reports and records. • Any unsafe conditions reported by workers must be reported to the Safety Department immediately for prompt action.
Geotechnical Inspection	Earthworks integrity and maintenance requirements identification	Site Services Engineering Consultants	Biannually during the summer	• Inspection of geotechnical performance of facility. • Berm performance with emphasis on observations of cracking or any signs of instability • Document recommendations of any repair/maintenance work. • Record of any repair work made to the facility.

6 REFERENCES AND RECORDS

- Government of Nunavut. Department of Sustainable Development. Environmental Protection Service. Environmental Guideline for Contaminated Site Remediation. March 2009.
- Environment Canada. Federal Contaminated Sites Action Plan (FCSAP): Federal Guidelines for Landfarming Petroleum Hydrocarbon Contaminated Soils. ISBN no. 978-1-100-22284-4. Cat. No. En14-19/3-2013E-PDF. 2013.
- Nunavut Water Board - Type A Water Licence No: 2AM-MRY1325
- EBA. Preliminary Hydrocarbon Impacted Soils Storage and Landfarm Facility – Operations, Maintenance and Monitoring Plan. EBA File No. E14101092. Milne Inlet, September 2011.
- EBA. Laboratory Biotreatability Study to Evaluate Biodegradation of Petroleum Hydrocarbons. SiREM Ref: TL0307B. Milne Inlet, July 2012.
- Waste Management Plan (BAF-PH1-830-P16-0028)
- Hazardous Materials and Hazardous Waste Management Plan (BAF-PH1-830-P16-0011)

Attachment A

Landfarm Facility User Rules

1. **RESTRICTED ACCESS – ONLY SITE SERVICES PERSONNEL ARE ALLOWED TO ENTER THIS FACILITY.**
2. **Only HYDROCARBON contaminated snow and soil are accepted at this facility.**
3. **Incinerator, hazardous and/or landfill waste are NOT accepted at this facility.**
4. **All placement of soil and contaminated snow in the facility must be preapproved by Site Services Supervisor prior to dumping.**
5. **Vehicles shall follow posted speed limits and directions to the unloading area - Unloading in other areas is strictly prohibited.**
6. **No unloading by rapid acceleration or deceleration is permitted.**
7. **All spills are to be stopped if safe to do so, and immediately reported to the Site Services Supervisor.**
8. **Personal Protective Equipment (PPE) is required to be worn at the facility.**
9. **In case of Emergency – Immediately contact the Site Services Supervisor or call a Code 1, if necessary, providing your location, your name and the nature of the emergency.**

Attachment B

LANDFARMING - BASIC PROCESSES AND PRINCIPLES

The Milne Port landfarm is a bioremediation treatment facility that remediates soils impacted by PHC spills and releases. Remediation is achieved by spreading contaminated soil in a thin layer (30 – 45 cm) across the landfarm area and allowing two natural processes to remove the PHCs from the soil: (1) PHC degradation by naturally occurring microorganisms; and (2) chemical volatilization.

The breakdown of PHC by aerobic microbial degradation is the dominant process of the two and results in three main end products: water, carbon dioxide and microorganism protein. The stimulation of microbial growth and activity for the removal of PHCs is accomplished primarily through the addition of air and nutrients. Microorganisms that degrade PHCs require optimal quantities of water, oxygen, and macronutrients (carbon, nitrogen, hydrogen, oxygen, sulphur, phosphorus, potassium, and magnesium), and have an ideal soil pH between 6 and 8. In addition, excessive salt compounds reduce the osmotic potential of the soil and can slow, or even halt biodegradation. Salts that are harmful to biodegradation in excessive concentrations include sodium chloride and particular fertilizer amendments.

The overall effectiveness of landfarming depends on the following three main parameters:

1. Soil characteristics; grain size, soil texture, bulk density, moisture content and permeability;
2. Type of petroleum hydrocarbon or contaminant; and
3. Climatic conditions.

Soil characteristics influence the rate of at which impacted soils remediate by affecting several factors including PHC retention, water holding capacity, surface area, permeability and bioavailability. Most soil microorganisms that breakdown PHCs in a landfarm require an aerobic environment, making remediation of soil with low permeability, such as clay, more difficult. Because of this, tilling is conducted to loosen and aerate the soils in order to enhance microbial activity.

Moreover, the type of PHCs present in impacted soils is one of the main factors that determines the amount of time required for remediation. Soils impacted by diesel and/or Jet-A remediate significantly faster than soils contaminated with hydraulic and engine oils due to the differences among the PHCs chemical composition.

Climatic conditions including rainfall, snow, wind effects and temperature also influence remedial efficiency. Rain and snow melt will change the moisture content of the treated soil which in turn can alter the activity of the microorganisms responsible for PHC degradation. In contrast, wind and low humidity have the potential to increase water evaporation and dry out remediating soil. Maintaining the moisture content of impacted soils within a range of 40% to 85% of the soil's water-holding capacity will enhance biodegradation and avoid dust generation.

Appendix D -
MSDS Approval and Management Procedure

(Document #: BAF-PH1-810-PRO-0025)

Baffinland Iron Mines Corporation

MSDS Approval and Management Procedure

BAF-PH1-810-PRO-0025

Rev 0

Prepared By: Shiwley Paul
Department: Health and Safety
Title: Health and Safety Analyst
Date: February 26, 2015
Signature:

Approved By: Tony Noseworthy
Department: Health and Safety
Title: Health and Safety - Superintendent
Date: February 26, 2015
Signature:

DOCUMENT REVISION RECORD

Issue Date MM/DD/YY	Revision	Prepared By	Approved By	Issue Purpose
02/26/15	0	S.P	T.N	Use

TABLE OF CONTENTS

1 PURPOSE

The purpose of this procedure is to ensure that any and all controlled or non-controlled products which have an external material safety data sheets (MSDS) shall be reviewed and authorized prior to use at any Baffinland site including Steensby, Mine Site, Port Site and Oakville corporate office. In addition, this procedure outlines proper management of MSDS to ensure timely updating and site wide access for all personnel who work with or around controlled/uncontrolled substances.

2 SCOPE

This document applies to all controlled and non-controlled products which are to be procured for use on any Baffinland site, including Steensby, Mine Site, Port Site and Oakville corporate office.

3 RESPONSIBILITES

3.1 REQUISITIONER

The requisitioner shall complete the Product Approval Form and submit the form to Health and Safety and Environment Departments with the most current version of the MSDS attached. The requisitioner shall create a purchase requisition (PR) and attach the MSDS as well as the product approval form to the PR in SAP.

3.2 BUYER

The Buyers shall place the order for the product and request an up-to-date version of the MSDS from the vendor.

3.3 WAREHOUSE

Warehouse Technicians/Supervisors shall receive the products and update the MSDS Online database. If the MSDS provided by the vendor is newer than the version available on MSDS Online, the Warehouse Technician/Supervisor shall upload the newer version into the system.

Warehouse shall set the location as “Warehouse” for all Controlled and Un-Controlled products which are received into the warehouse. Furthermore, the Warehouse shall update the location on all items requiring an MSDS once those items are signed out of the warehouse.

The warehouse shall ensure that no products are shipped to site from Kitchener Airport without proper authorization and approvals. The warehouse shall hold any products that do manage to arrive on site without proper approval, until such approval is obtained.

3.4 HEALTH AND SAFETY

The Health and Safety department may approve all requested products after ensuring that there is no other product which is safer for use and will accomplish the same thing, and that proper PPE available for use with the product. Furthermore, the safety department shall perform annual audits of MSDS in the field.

3.5 ENVIRONMENT

The Environment department may approve requested products after conducting a review that includes an assessment of the product based on the following aspects:

- Are there alternative products already available, or more suitable products which will accomplish the same purpose?
- Will the use of the product lead to a high potential for violation of existing environmental permits, or pose significant issues with respect to clean-up in the event of spill, and potential issues associated with proper disposal.
- Will the substance be captured under federal environmental reporting or other regulations?
- Will the product require particular storage (e.g. heated, ventilated, segregated for incompatibility)?
- If inadvertently disposed in the sewer system, could the product pose risk to the wastewater treatment plant operation?

The environment department shall keep and file all original copies of the product approval forms.

4 DEFINITIONS

Material Safety Data Sheets: A document that contains information of the potential hazards (health, fire, reactivity, etc) and how to work safely with the chemical product.

Controlled Product: Any products, materials or substances that are regulated by WHMIS legislation. All controlled products fall under one or more of the six WHMIS categories.

Non-Controlled Products: Products that do not fall under one of the six WHMIS categories.

5 REFERENCES AND RECORDS

N/A

Appendix A

Baffinland Product Approval Form

Appendix A: Baffinland Product Approval Form

Department: _____ Date: _____

Contact Person: _____ Telephone #: _____

Approval Required By (Date): _____

Name of Product: _____

Chemical Name: _____

Manufacturer: _____

Area/ Department to be used: _____

Usage: TRIAL ONE TIME USE PERMANENT

Revision date of MSDS (must be valid within three years): _____

Product to be used as follows (be specific):

_____

_____

_____

Is there an existing chemical on site used for the same purpose? _____

Will this new product replace the existing chemical? _____

List alternate chemicals considered: _____

Type of container for the chemical: _____

Order quantity: _____

Projected usage rate: _____

***Below is to be completed by BIM Environment and H&S Coordinator.**

Personal Protective Measures:

_____

_____

_____

Storage Requirements

_____

_____

_____

Waste management:

_____

_____

_____

Disposal method:

_____

_____

HEALTH AND SAFETY

Approval: _____ Date: _____

ENVIRONMENT

Approval: _____ Date: _____

BAF-PH1-810-FOR-0016 Rev0