Baffinland Iron Mines Corporation

FRESH WATER SUPPLY, SEWAGE, AND WASTEWATER MANAGEMENT PLAN

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Rev 2

Prepared By: Jim Millard
Department: Environment
Title: Environmental Manager
Date: Jan. 31, 2014
Signature:

Approved By: Erik Madsen
Department: Sustainable Development, Health, Safety & Environment
Title: Vice President, Sustainable Development, Health, Safety & Environment
Date: Jan. 31, 2014
Signature:

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Index of Major Changes/Modifications in Revision 2

Item No.	Description of Change	Relevant Section
1	Updated Introduction for annual reporting requirements	Section 1
2	Updated Freshwater Section for Milne Port and Mine Site to account for future construction and operation	Section 4.3.1 and 4.3.2
3	Updated Table 5-3: Approximate Treated Effluent Generation and Discharge/Outfall Locations to include proposed Milne Port and Mine Site Discharge locations	Table 5-3
4	Updated Sewage Section for Milne Port and Mine Site to include discharge locations for future construction and operation	Section 5.4.1 and 5.4.2
5	Updated Oily Water Treatment Section for Milne Port and Mine Site for future construction and operations.	Section 6.2.1 and 6.2.2
6	Updated Roles and Responsibilities Section	Section 10
7	Updated Organizational Chart	Figure 1-1
8	Included 2014 Work Plan	Appendix B
9	Updated Site Layouts for Mine Site and Milne Port	Appendix B
10	Updated Block Flow Diagrams for Construction Water Supply at Milne Inlet and Mine Site	Appendix C
11	Removed Sections from plan and added Appendix E- Steensby and Rail Camps Freshwater Supply, Sewage and Waste Water – Plans for Future Work	Appendix E
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1 INTRODUCTION

This document describes the fresh water supply and wastewater management plan for the various camp sites to be developed for the Mary River Project during the construction and operation phases of the project. Specifically, this document focuses on freshwater supply and wastewater treatment and disposal at Milne Port, Mine Site, Steensby Port and various rail camps.

In accordance with annual reporting requirements this plan has been updated to take into account commitments made with respect to submissions received during the preliminary and technical review of various regulatory Application documents as well as final submissions and issues raised during Public Hearing Process. This plan has also been updated to support all work in the 2014 Work Plan (see Appendix B).

The Fresh Water Supply, Sewage, and Wastewater Management Plan (the Plan) is an update to the existing plan and supersedes the H349000-1000-07-126-0006, Revision 1, dated September 2013 and supplements the existing Wastewater Management Plan (Revision 3, dated March 2012). The existing March 2012 Wastewater Management Plan will continue to support the existing RBC Sewage Treatment Plant (STPs) at the Mine Site and Milne Port which service existing exploration camps, while this new Plan will support the construction and commissioning of the new Membrane Biological Reactor (MBR) STPs for new camps at the Mine Site and Milne Port, as well as supporting potable water supply and oily water treatment activities under the Type A Water Licence.

The Plan is should be used in conjunction with the Aquatic Effects Monitoring Plan (AEMP)[1] and the Surface Water Sampling Program – Quality Assurance and Quality Control (QA/QC) Plan[2].

[1] AEMP addresses issues identified in the Environmental Impact Assessment (EIS) which have potential impact to the aquatic receiving environments using an integrated, ecosystem-based approach that links mitigation and monitoring of physical/chemical effects to key ecological receptors in the receiving environment.

[2] The Surface Water Sampling Program QA/QC plan outlines best practices designed to provide guidance to field staff and analytical laboratories in order to maintain a required confidence level in the water quality data.

2 REGULATIONS, STANDARDS, AND CODES

As a minimum standard of acceptability, all actions undertaken will be compliant with appropriate sections of both Federal and Provincial legislation as indicated in the table below:

TABLE 2-1: APPLICABLE REGULATIONS, STANDARDS AND CODES

Number/Acronym	Title
AWWA	American Water Works Association
IBC	International Building Codes
NSF	National Sanitation Foundation
GCWQ	Guidelines for Canadian Drinking Water Quality
NWT Regulation 108-2009	Northwest Territories Water Supply System Regulations
Ontario Regulation 170/03	Safe Drinking Water Act, 2002
Nunavut Waters and Nunavut Surface Rights Tribunal Act, SC 2002, c 10	
Northwest Territories Water Act	
Northwest Territories Water Regulations (SOR/93-303)	
Ontario Drinking Water Quality Standards	
Canadian Fisheries Act	
Canadian Environmental Protection Act (1999)	
CCME Water Quality Guidelines for the Protection of Aquatic Life	
Ontario Guidelines for Sewage Works 2008	
CCME Guidelines for Compost Quality	
NSF/ANSI Standard 61	Drinking Water System Components
AWWA Standard B100	Filtering Material
AWWA Standard B604	Granular Activated Carbon
OSHA	Occupational Safety and Health Administration

3 SUSTAINABLE DEVELOPMENT POLICY

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:

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

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

4 FRESH WATER

4.1 GENERAL MITIGATION MEASURES FOR WATER USE

4.1.1 WATER INTAKES

4.1.1.1 ENGINEERING INTAKE STRUCTURES

Engineered intake structures are designed to minimize erosion, avoid sediment issues, and provide protection from ice and peak water flow. Care is taken to ensure that disturbance to aquatic environments is minimized during installation and maintenance of infrastructure. Rip rap used in construction is clean, free of fine sediment, non-acid leaching, and non-metal generating.

4.1.1.2 SCREENS ON INTAKE PIPES

All intakes are screened in accordance with the Department of Fisheries and Oceans (DFO) Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO Guideline) to ensure no entrapment of fish. This guideline requires a 2.54 mm mesh size on the water intake pipeline to prevent entrainment of fish greater than 25 mm in length. It also requires a water withdrawal rate such that fish do not become impinged on the screen.

4.1.1.3 SELECTION OF SHORT-TERM WATER TAKE LOCATIONS

Short-term water intake will be required at many locations for a variety of needs. This includes concrete manufacture, dust suppression, drill water, etc. A screening process will be used to confirm whether water sources are considered adequate as water take locations. Source selection begins by looking for the largest possible water body that is feasible for use. Lakes are considered first, followed by ponds and then large rivers. Streams and creeks will not be used for short term water take without prior approval of the Water Licence Inspector. The DFO guideline used for water take from water bodies is to restrict removal of water to a maximum of 5% of the total volume. During winter under ice conditions water must be drawn from below two (2) m of non-frozen water (as the top two (2) m of water contain the majority of oxygen for fish). During the open water season, the water taking guideline states that no significant drawdown shall be caused. There must be no impact to fish or fish habitat.

4.1.2 WATER METERING AND WATER CONSERVATION MEASURES

Water meters are installed at strategic locations to monitor water consumption and enable the development of management strategies to reduce water usage/consumption. These strategies include the installation of low flow water taps, water use for drilling operation, etc.

4.2 FRESH WATER SOURCES

All fresh water for domestic camp use and industrial purposes, during Construction Phase of the Project shall be obtained in amount and from sources listed in the Table below:

TABLE 4-1: WATER USE FOR DOMESTIC AND INDUSTRIAL PURPOSES DURING THE CONSTRUCTION PHASE *

Site	Source	Volume	Combined Volume
Milne Port (Milne Inlet)	Phillips Creek (summer)	68.5 m^3/day	25,000 m^3/year
	Km 32 Lake (Winter)		
Mine Site (Mary River)	Camp Lake	657.5 m^3/day	240,000 m^3/year
Steensby Port (Steensby Inlet)	ST 347 Km Lake	435.8 m^3/day	155,400 m^3/year
	3 Km Lake		
Raven River	Camp Lake	145.2 m^3/day	
Mid-Rail	Nivek Lake (Summer)	79.5 m^3/day	
	Ravn Camp Lake (Winter)		
Cockburn North (Tunnels Camp)	Cockburn Lake	101.4 m^3/day	
Cockburn South Camp	Cockburn Lake	111.1 m^3/day	
	TOTAL	**1,589 m^3/day**	**580,000 m^3/year**

*Source: Type A Water Licence (2AM-MRY1325) Table 2

The above water sources have been approved by the Water Board for freshwater sources. Streams will not be used as a water source unless authorized and approved by the Board in writing and no material shall be removed from below the ordinary High Water Mark of any water body unless authorized. For remote fresh water requirements such as dust suppression, tunnelling, geotechnical and exploration drilling, some water may be drawn by truck from nearby lakes and ponds and used directly.

4.3 FRESH WATER SYSTEM PROCESS DESCRIPTION

The following sections describe the fresh water systems at the various sites.

Each site also includes a potable water treatment system which produces drinking water for the personnel at the site during construction and operation phases. These systems treat water to meet the Guidelines for Canadian Drinking Water Quality as well as the Ontario Drinking Water Quality Standards.

Minimum process equipment requirements are based upon the Northwest Territories Water Supply System Regulations, NWT Regulation 108-2009, Ontario Design Guidelines for Drinking Water Systems 2008, Ontario Regulation 170/03 - Drinking Water Systems, the Procedure for Disinfection of Drinking Water in Ontario, as well as best management practice.

4.3.1 MILNE PORT

Currently onsite at Milne Port there are existing camps that support construction and minor exploration activities. These camps include the existing Nuna Camp and Matrix Tent Camp as well as the newly constructed Horizon Camp. Each camp contains Potable Water Treatment Plants (PWTP) within the camps as well as freshwater tanks to store raw water being delivered. The freshwater demand for construction and operation are shown on drawing Milne Inlet – Water Supply Balance Block Flow Diagram in Appendix C of this plan.

A raw water truck draws water from either 32 km lake (in winter/summer) or Phillips Creek (in summer) and delivers the water to a water storage tank near the camp. Milne Inlet Camp Layout including locations for potable water related infrastructure is presented in Appendix B.

A heated and insulated pump house will be built with duty/standby pumps to deliver fresh water from Phillips Creek to a fresh water tank during summer. During winter/summer fresh water from 32 Km lake will be trucked to the fresh water tank. Water from this tank will be used to provide fire water as well as meet the fresh water requirements of the site. A stand pipe within the tank ensures that fire water is always available in the tank.

The potable water treatment scheme consists of coagulation followed by media filtration and disinfection by ultraviolet radiation. The water then undergoes a secondary disinfection by sodium hypochlorite injection to ensure residual chlorine content at the point of use.

4.3.2 MARY RIVER SITE

Currently there are existing camps at the Mine Site to support onsite construction and site wide exploration activities with capacity for operations coming online in 2014. These camps include the existing Weatherhaven Camp as well as the newly constructed Horizon Camp. Fresh water supply for the Mary River Mine Site camps is obtained using an electric pump positioned adjacent to the shoreline of Camp Lake. Water is pumped directly from the lake source to water storage tanks located at both camps. Until the raw water pipeline is installed, the raw water is trucked. A heat traced pipe will be installed, away from the road, to support the raw water system at the Mine Site. The heat traced pipe will be similar to that used on the existing RBC to Sheardown Lake pipe, with additional pipe bridges and a culvert water crossing required. Mine Site Camp Layout including locations for potable water related infrastructure is presented in Appendix B of this Plan.

The potable system is a permanent system to support the Mine Site Camps during both construction and operation phases. The fresh water demand during construction and operation activities are shown on the drawing Mine Site - Water Supply Balance Block Flow Diagram in Appendix C. The potable water system is modularized so that should the camp occupancy increase, additional modules can be added.

Specifically, the potable water system consists of a new heated and insulated pump house and raw water jetty at Camp Lake. The system is currently under construction with duty/standby pumps to deliver fresh water to fresh water tanks at both the Weatherhaven Camp and near the Horizon Camp. Water from these tanks will be used to provide fire water as necessary, as well as meet the fresh water requirements of the site. A stand pipe within each tank will ensure that fire water is always available in the tank. Some fresh water requirements such as road dust suppression, exploration drilling, quarry dust suppression, concrete and explosives manufacturing will be provided directly from nearby lakes using vacuum truck. Exploration drilling will continue throughout the construction phase.

The potable water treatment scheme consists of coagulation followed by media filtration and disinfection by ultraviolet radiation. The water will then undergo a secondary disinfection by sodium hypochlorite injection to ensure residual chlorine content at the point of use.

5 SEWAGE TREATMENT

5.1 SEWAGE GENERATION RATE

The estimated generation of sewage is based upon a per capita generation as shown below:

TABLE 5-1: STP AVERAGE SEWAGE FLOW DESIGN BASIS

Parameter	Design Value	Source
Sewage Generation per Capita	360 L/person/day	Design Basis – Sewage Treatment Plant, Doc. No. H337697-4000-10-109-0002 (FEIS, Appendix 3B). Includes a 20% design allowance.

Note: The rate of sewage generation given above may be reduced when actual representative water usage data is obtained from site. Additional reductions may be achieved by water conservation.

5.2 SEWAGE DISCHARGE CRITERIA

All Sewage generated from relevant Project sites is directed to the Sewage Treatment Facilities or as otherwise approved by the Nunavut Water Board. As per the Type A Water Licence (2AM-MRY1325) Baffinland is constructing and operating all infrastructure and Facilities designed to contain, withhold, divert or retain Water and/or Waste in accordance with all applicable legislation and industry standards. Effluent will be discharged such that surface erosion is minimized and no additional impacts are created. The quality of the sewage treatment plant effluent discharging to Freshwater or directly into the ocean shall be in accordance with the applicable site discharge limits and the approved Type A Water Licence (2AM- MRY1325) as listed in the following table:

TABLE 5-2: EFFLUENT DISCHARGE QUALITY LIMITS FOR SEWAGE TREATMENT FACILITIES TO FRESHWATER AND TO THE OCEAN *

Parameter	Unit	Maximum Concentration of Any Grab Sample discharging into Fresh Water (mg/L) Monitoring Locations: MP-01, MP-01a, MP-MRY-04, MP-MRY-04a, MS-01, MS-01a, MS-MRY-04, MS-MRY-04a	Maximum Concentration of any Grab Sample discharging into Ocean (mg/L) Monitoring Locations: SP-01, SP-01a
BOD_5	mg/L	30	100
TSS	mg/L	35	120
Faecal Coliform	cfu/100 mL	1000 CFU /100 ml	10,000 CFU /100 ml
Oil and Grease*	mg/L	No visible sheen	No visible sheen
pH	---	Between 6.0 and 9.5	Between 6.0 and 9.5
Ammonia	mg/L NH3-N	4.0	-
Total Phosphorus (MS-01)	mg/L	4.0	-
Total Phosphorus (MS-01a)	mg/L	1.0	-
Toxicity	---	Final effluent not acutely toxic	Final effluent not acutely toxic

*Source: Type A Water Licence (2AM-MRY1325) Table 4 and 5

Recycled water and use of reclaimed water from the various Treatment Facilities, surface water management ponds and embankment dams and approved discharge locations may be used if waters meet appropriate discharge criteria for those facilities. Sludge generated from Sewage Treatment Facilities or any other facilities shall be confirmed to be non-hazardous prior to disposal at any Landfill facility or approved location.

5.3 TREATED WASTEWATER GENERATION AND DISCHARGE/OUTFALL LOCATIONS

Treated sewage and wastewater for the Project are discharged to the following locations:

TABLE 5-3: APPROXIMATE TREATED EFFLUENT GENERATION AND DISCHARGE/OUTFALL LOCATIONS*

Camp/Site	Discharge/Outfall Location		Coordinates
	Summer	Winter	
Milne Port	Ocean at Milne Inlet		Existing: N: 7976482 E: 503211 New/Proposed: N: 7976341 E: 503639
Mine Site	Sheardown Lake for existing camp	Storage Pond	N:7913630 E:559733
	Winter Discharge 1 to Mary River		N:7911948 E:562321
	Winter Discharge 2 to Mary river		N:7911938 E:562344
	Summer Discharge Mary River		N 7 911 990 E 562 225
Tote Road Camp	Conveyed to Mine Site or Milne Port Sewage Treatment		N/A
Steensby (Port)	Ocean at Steensby Port		N: 7801412 E: 593378
Ravn River Area	Conveyed to Mine Site Sewage Treatment		N/A
Mid-Rail Area	Conveyed to Mine Site Sewage Treatment		N/A
Cockburn Tunnels Area	Conveyed to Steensby Sewage Treatment		N/A
Cockburn South Camp	Conveyed to Steensby Sewage Treatment		N/A

Note* Refer to Site Block Flow Diagrams in Appendix C for Milne Port and Mine Site anticipated annual effluent discharge.

All discharge from the Landfill Facilities will not exceed the following Effluent quality limits in the table below:

TABLE 5-4: EFFLUENT DISCHARGE QUALITY LIMITS FOR THE LANDFILL FACILITIES*

Parameter	Maximum Concentration of Any Grab Sample (mg/L)
pH range	Between 6.0 and 9.5
Total As	0.5
Total Cu	0.3
Total Pb	0.2
Total Ni	0.5
Total Zn	0.5
TSS	15
Oil and Grease	No visible sheen

*Source: Type A Water Licence (2AM-MRY1325) Table 7

All discharge from the Bulk Fuel Storage Facilities will not exceed the following Effluent Quality Limits provided in the table below:

TABLE 5-5: EFFLUENT DISCHARGE QUALITY LIMITS FOR THE BULK FUEL STORAGE FACILITIES*

Parameter	Maximum Concentration of any Grab Sample (ug/L)
Benzene	370
Toluene	2
Ethylbenzene	90
Lead	1
Oil and Grease	15,000 and no visible sheen

*Source: Type A Water Licence (2AM-MRY1325) Table 8

All discharge from the Landfarm Facilities will not exceed the following Effluent quality limits provided in the table below:

TABLE 5-6: EFFLUENT DISCHARGE QUALITY LIMITS FOR THE LANDFARM FACILITIES*

Parameter	Maximum Concentration of any Grab Sample (mg/L)
pH range	**Between 6.0 and 9.0**
Total Suspended Solids	**15**
Oil and Grease	**15 and no sheen**
Total Lead	**0.001**
Benzene	**0.370**
Toluene	**0.002**
Ethylebenzene	**0.090**

*Source: Type A Water Licence (2AM-MRY1325) Table 9

All discharge from the Bulk Sample Open Pit, Bulk Sample Weathered Ore Stockpile, Bulk Sample Processing Stockpile Area and Bulk Sample Stockpile Area Seepage will not exceed the following Effluent quality limits:

TABLE 5-7: EFFLUENT DISCHARGE QUALITY LIMITS FOR ORE STOCKPILES AND PITS*

Parameter	Maximum Concentration of any Grab Sample (mg/L)
Total Arsenic	0.50
Total Copper	0.30
Total Lead	0.20
Total Nickel	0.50
Total Zinc	0.50
TSS	15
Oil and Grease	No visible sheen
Toxicity	Not acutely toxic
The waste discharge shall have a pH of between 6.0 and 9.5	

*Source**:** Type A Water Licence (2AM-MRY1325) Table 10

All discharge from the Ponds associated with the Run of Mine Ore Stockpile, Ore Stockpile, West and East Sediment Ponds at Monitoring stations MS-06+, MS-07, MS-08 MS-09 and SP-07 shall not exceed the Effluent quality limits in the table above. All monitoring points can be found in the Aquatic Effect Monitoring Plan.

5.4 SEWAGE TREATMENT PROCESS DESCRIPTION

The process description for the sewage treatment systems at each site are described in the sections that follow. Note that for design purposes originally a per capita sewage generation rate of 344L/person/day had been considered which is higher than the per capita potable water consumption rate (300L/person/day). This was to ensure that the sewage treatment systems would have a higher design allowance. For consistency 300L/person/day will now be used for both potable water consumption and sewage generation. A 20% design allowance is added to this requirement. Also please note that actual camp occupancy can be optimized based on potable water conservation measures that can be implemented to reduce per captia water consumption and reduce overall sewage generation.

5.4.1 MILNE PORT

Currently onsite there is an existing Rotating Biological Contactor (RBC) type Sewage Treatment Plant (STP) (Seprotech manufactured), as well as the new sewage treatment plant (Membrane Biological Reactor (MBR)) which has been designed to meet the project sewage effluent discharge limits. With the existing RBC sewage treatment plant, sludge is discharged to a dedicated waste pond. Treated effluent is stored in a small heated tank. The effluent is then withdrawn by a vacuum truck and if it meets discharge requirements it is discharged to the identified overland outfall which drains by gravity to the ocean (See table 5-3 for co-ordinates). There is a proposed discharge location at Milne Inlet that is shown n in Milne Port Site Layouts (refer to Appendix B). The proposed outfall location is north of the

existing fuel farm facility and discharges to an existing drainage system approximately 100 m from Milne Inlet. The proposed outfall location is necessary for two reasons. The first reason is that the new location reduces the piping length with a direct route from the new STP to the PWSP and on to the ocean. The second reason is that the old discharge point and holding pond will be decommissioned to support proposed Early Revenue Phase (ERP) development that is currently in the regulatory approval stage. If effluent does not meet the discharge requirements the vacuum truck delivers it to a local polishing/waste stabilization storage pond for additional treatment. The RBC will be eventually be decommissioned, however in the interim it may be used as a surge tank or as part of a contingency plan.

Treated effluent from the new MBR sewage treatment plant is stored in a treated effluent tank which has a hydraulic retention of time of 8 hours (at minimum) based upon nominal flows. It is designed such that the effluent tank will be at a low level during operation such that if sampling indicates that the effluent quality does not meet the applicable criteria further discharge can be delayed to allow this effluent to be mixed, retreated, and retested. Once sampling indicates that effluent is meeting discharge criteria the treated sewage stream is directed to discharge via truck or pipeline to the ocean discharge. Off-spec effluent remaining in the polishing waste stabilization pond (PWSP) will be removed by vacuum truck and fed into the new sewage plant feed tank for re-processing or treated by means of a pond treatment system that is described and approved in the existing Wastewater Management Plan.

In the event that there is an electrical power outage that causes either of the sewage treatment plants to be completely inoperable, raw sewage will be diverted temporarily, trucked to the PWSP, until the sewage plant is operating again. At that time, partially or untreated sewage from the PWSPs will be either trucked back to the treatment plant for treatment or an in situ pond treatment system will be operated and discharge will be directed to the ocean outfalls (Refer to Appendix F - PWSP Effluent Discharge Plan).

The sludge generated by the MBR is dewatered using a mechanical dewatering device, a filter press, and then incinerated. Sludge is stored in an animal proof secure area. Odour generation is limited because the sludge is aerobically digested, dewatered and incinerated regularly such that the sewage cake is not stored for significant periods. Odour control carbon vents are installed where deemed necessary. The incinerator design considered the solids content of the sludge from the dewatering device.

The sewage treatment system basis as described above will be applicable for current and future construction and operations requirements. The site layout showing the location of camp, sewage treatment and ancillary facilities is presented in Appendix B.

5.4.2 MARY RIVER SITE

The Mine site has a functioning RBC based sewage treatment system designed to accommodate camp population in the existing exploration Weatherhaven camp. The RBC and ancillary facilities (three PWSPs and discharge pipeline) operate under the existing Type A Water Licence and Wastewater Management Plan (March 2012). It is anticipated that there will be year round operations of the existing exploration camp and RBC during 2014, with the camp and sewage treatment system operating seasonally as

needed, thereafter. Sludge is currently vacuumed from the existing RBC unit periodically and allowed to settle in one of the PWSP; the supernatant from these ponds is tested, mixed, treated if required, then reprocessed/discharged to Sheardown Lake.

In addition to the RBC there is a new sewage treatment plant (MBR) which is being commissioned and installed onsite. To successfully commission the plant and meet discharge criteria portions of the camp wastewater are directed through the MBR unit. In addition, biosolids from the existing RBC treatment system will be added into the new unit aeration tank to 'seed' the unit with biomass. During this period, effluent generated by the newly installed sewage plant will be directed to a PWSP(one of the existing PWSPs or a newly constructed PWSP). The flow rate to the unit will then steadily be increased until the unit is operating at full capacity. Off-spec effluent remaining in the pond will be removed by vacuum truck and fed into the new MBR sewage plant feed tank for re-processing or treated at the PWSP using established methods currently used for the Exploration Camp. Additional off-spec effluent ponds will be constructed at the Mine Site to provide capacity for treated effluent storage. Initially effluent from the MBR and the existing RBC will either be trucked via a vacuum truck or piped to the PWSPs. The additional off spec effluent ponds will consist of a multi-celled structure and will be developed on a modular as needed basis to store additional off spec effluent. Mine Site Layouts are presented in Appendix B of this Plan.

Once sampling/analyses indicates that sewage effluent meets discharge criteria, the following operations are conducted. During the winter, treated effluent from the MBR STP that meets discharge requirements is discharged by pipeline or trucked to one of two designated winter discharge locations (refer to Table 5-3 for coordinates) over an embankment that drains into Mary River. The effluent will freeze in a side depression to the main Mary River channel and then drain by gravity directly into Mary River. During the summer the treated effluent from the MBR STP will be discharged directly from the treated effluent pond into a natural drainage (non fish habitat) that discharges directly into Mary River. Rip rap will be placed at discharge locations as required to reduce sedimentation and erosion at the discharge location or along the drainages upstream of Mary River. Specific discharge locations into Mary River can be seen on the Mine Site Layout found in Appendix B. The discharge strategy will be reviewed annually and optimized as necessary.

The sludge generated at the new MBR is dewatered using a mechanical dewatering device, a filter press, and then incinerated. Sludge cake is stored in an animal proof secure area. Odour generation will be limited because the sludge will be aerobically digested, dewatered and incinerated regularly such that the sewage cake is not stored for significant periods. Odour control carbon vents are installed where deemed necessary. The incinerator design considered the solids content of the sludge from the dewatering device.

The existing RBC for the exploration camp will be used as a contingency during peak demand with sludge and effluent discharged as described above and the RBC may be used as a surge tank as necessary . The new MBR sewage treatment plant is designed to process raw or partially treated sewage from Ravn and

Mid-Rail camps when required which will be conveyed to the Mary River permanent sewage treatment facility usually by truck.

Similar to early construction, treated sewage effluent generated from the RBC is stored in a treated effluent tank. The effluent tank has a hydraulic retention of time of 8 hours (at minimum) based upon nominal flows.

Off-spec treated sewage from the RBC is sent to the PWSPs as required. The treated effluent in the PWSP's will be sampled/analyzed and if effluent requirements are met, it will be discharged. If effluent requirements are not met, the partially treated sewage effluent will be treated in situ at the pond location or directed back to the sewage treatment plants for reprocessing. In the event that there is an electrical power outage that causes the sewage treatment plant to become inoperable, raw sewage will be temporarily trucked to local existing polishing waste stabilization ponds until the sewage plant comes on line again. Partially or untreated sewage from the PWSPs from this event will either be trucked back to the treatment plant for treatment reprocessing or treated in situ at the pond location (Refer to Appendix F - PWSP Effluent Discharge Plan).

6 OILY WATER/WASTEWATER TREATMENT

There are two sources of potentially oily water that have been identified at Milne Port and the Mine site. There is the wash-water generated at the vehicle maintenance facilities, waste management building, emergency response garage and Mine Site truck wash and then there is water that collects within the fuel berms at the sites. Based on the different nature of these two wastewater sources, distinct discharge criteria (and treatment plans) have been developed for each.

6.1 OILY WATER TREATMENT PLANT DISCHARGE CRITERIA

All discharge from the Oily Water/Wastewater Treatment Facilities for monitoring stations MP-02, MS-02, SP-02 will not exceed the following Effluent quality limits provided in the Table below.

TABLE 6-1: EFFLUENT DISCHARGE QUALITY LIMITS FOR OILY WATER TREATMENT FACILITIES*

Parameter	Maximum Concentration of Any Grab Sample (mg/L)
pH	6 – 9.5
TSS	35
Ammonia	4
Phosphorous	4
Benzene	0.370
Ethylbenzene	0.090
Toluene	0.002
Oil and Grease	15 and no visible sheen
Arsenic	0.5
Copper	0.30
Lead	0.20
Nickel	0.50
Zinc	0.50

*Source: Type A Water Licence (2AM-MRY1325) Table 6.

6.2 OILY WATER/WASTEWATER TREATMENT PROCESS DESCRIPTION

Oily water and wastewater generated by the Project shall be treated at the Oily Water/Wastewater Treatment Facilities allowed under the scope of the Licence. The process description for both oily water/wastewater treatment systems at each site are described in the sections that follow.

6.2.1 MILNE PORT

The Site layouts showing the locations of the maintenance facility and fuel containment/other berm expansions are presented in Appendix B. The existing bulk fuel bladder farm will be decommissioned during 2013 and 2014. The treatment system that services this facility will not likely be needed for normal operations after that time, but if the need arises, can be re-commissioned for that purpose.

Any oily water generated from the expanded tank farm is collected in a sump located at the tank farm. The water will then be treated directly by the mobile trailer based oily water treatment system.

The vehicle maintenance will have a sump located in close proximity to the maintenance facilities. Wash water produced in the maintenance facility (truck washing, equipment and floor washdown) will flow by gravity and be collected in the local sump. Suspended material in the wastewater will settle in the sump. Free oil in the wastewater will be removed by an oil/water separator system in order to meet the required oil discharge limits. The waste will then be further treated in the oily water treatment plant by activated carbon and clay to meet other specific parameters. The effluent will then be pH adjusted, if required, to meet discharge criteria.

Treated oily water will be blended with treated sewage and discharged or discharged directly based on sampling.

6.2.2 MARY RIVER SITE

Oily water generated throughout the site in lined containment facilities is treated using a mobile trailer based oily water treatment system to handle any spills. Treated oily water is blended with treated sewage and discharged or discharged directly based on sampling.

Oily water may be generated from the following sources (this neglects minor oily water generated from accidental spills which will be handled by the spill management plan):

- Vehicle maintenance and wash facilities (i.e. truck wash, equipment and floor wash down water).
- Fuel tank farm run-off.
- Emulsion plant wash water.
- Airstrip.

The vehicle maintenance and wash facility is designed to recycle up to 90% of the water used. The facility does have a sump located in close proximity to the maintenance facilities. Wash water produced in the maintenance facility (truck washing, equipment and floor washdown) will flow by gravity and be collected in the local sump. Suspended material in the wastewater will settle in the sump. Free oil in the wastewater will be removed by an oil/water separator system in order to meet the required oil discharge limits. The water is then reused by the facility. Should there need to be a discharge from the facility, the wastewater would then be further treated in the oily water treatment plant by activated carbon and clay to meet other specific parameters. The effluent will then be pH adjusted, if required, to meet discharge criteria.

Treated effluent from the oily water treatment plant will be pumped to discharge, or recycled and reused as washdown water at the maintenance shops. The separated waste oil will be stored in a local tank. Periodically, the oil will be drained and reused if possible or incinerated. Accumulated suspended solids will be periodically removed by bucket loader vehicle and sent to a land fill for disposal.

Run-off from the tank fuel storage areas will be treated by a local oily water separator system that will be used as needed. The resulting water will be discharged directly to the receiving body (Mine Site - Mary River). The water will be periodically tested such that if any parameter is out of compliance the water will be removed by vacuum truck and treated in the vehicle maintenance shop wastewater treatment plant.

Run-off water from the freight dock will be collected and treated in a manner similar to the treatment scheme for the run-off from the tank fuel storage areas.

The emulsion plant shall be supplied with its own wastewater treatment plant which utilizes an evaporation system to evaporate the water leaving solid residue and oil. This residue will be tested for toxicity and if necessary taken off-site for disposal in a licensed facility otherwise the waste will be land filled.

Run-off water from the air strip run-off also has the potential for some oily water content. As such, this water will be collected through a drainage system and transported as needed by vacuum truck to the vehicle maintenance shop wastewater treatment plant.

7 OPERATIONS AND MAINTENANCE (O & M)

The project specific O & M Manual for Sewage Treatment Systems is provided by Newterra Ltd in Appendix D. Sample plans for operation and maintenance of proposed potable and oily water systems are given below. These plans were provided by vendors of potable and oily water treatment.

7.1 POTABLE WATER TREATMENT SYSTEM O & M PLAN

7.1.1 REGULAR MAINTENANCE SCHEDULE

The system will be designed for fully automatic operation, and only requires limited supervision and regular maintenance.

The following recommended maintenance schedule is subject to regulations from local government, and instructions from original equipment manufacturers.

The recommended maintenance schedule is common for all potable treatment plants.

TABLE 7-1: RECOMMENDED MAINTENANCE SCHEDULE- POTABLE TREATMENT PLANTS

Items	Description
Daily	• Alarm check. • Chemical storage level check. • Controller time check. • Pressure gauge check.
Monthly	• Turbidity analyzer check/calibration. • Residual chlorine/pH analyzer check/calibration.
Annual	• Filter media level check, and refill if required. • UV lamp replacement.

7.1.2 MONITORING PLAN

The monitoring plan is subject to local regulations of drinking water and other related codes. The following instruments will be provided to monitor the operation and performance of system.

- Inlet flow meter: to monitor feed flow, backwash flow, rinse flow and filtered flow.
- Effluent turbidity analyzer: to monitor turbidity in produced water.
- Effluent pH/residual chlorine analyzer: to monitor pH and residual chlorine of produced water.

The PLC system in control panel will totalize raw water, produced water, backwash water, chemical injection, pump running time etc.

Raw water and treated water storage/distribution system will be monitored by systems from others.

Periodically sampling and lab test for raw water and treated water will be applied to ensure the treated water meeting drinking water standards. The frequency of the sampling and testing will be determined by the ministry and outlined in the certificate of approval.

7.2 MOBILE OILY WATER TREATMENT SYSTEM O & M PLAN

7.2.1 REGULAR MAINTENANCE AND MONITORING SCHEDULE

Regular system maintenance entails routine inspection of mechanical and electrical components.

It is recommended that the system be inspected weekly to ensure that all components are in good working order. Spare parts lists will be included with the Operations and Maintenance Manuals, with critical spare parts and system expendables highlighted. Recommended stock quantities will also be given.

Additional, non-routine maintenance will be required throughout the life of the equipment. The recommended spare parts list and appropriate site stock levels are designed to keep the system running continuously with only scheduled downtime.

In addition to maintenance, monitoring the system performance and effluent quality are also necessary. It is further recommended that a flow totalizer be used at the effluent discharge to accurately summate the volume of treated water being released. This in conjunction with the quality data from the various system flows will allow forecasting for media and consumable change-out as well as waste oil and sludge generation. Residual contaminants below the regulatory limits can also be used in conjunction with treated volumes to determine area loadings over certain periods of time.

7.2.2 INFLUENT PUMP

When starting up influent pump make sure all valves are open to allow the process to flow. The influent pump is a gas powered pump. The start up procedure for the pump is:

- Make sure there is oil and gas in each of the tanks.
- Turn the gas switch on.
- Turn the on switch on.
- If the pump has not been running for an extended period of time make sure the choke is on.
- If it has been running for an extended period of time the choke does not have to be on.
- Make sure the throttle in on a low setting.
- Pull the ignition cord until the pump starts.
- Increase the throttle to your desired throughput.

7.2.3 PARTICLE FILTER

The maximum pressure across the particle filter can be 14 psig. This would indicate that the particle filter has become plugged and must be changed. The bag and spaghetti media are to be changed out once a month during operation.

7.2.4 CLAY ABSORPTION MEDIA FILTER

The media will be changed depending on the differential pressure across the housing. When handling the material a repertory mask must be worn due to inhalation of the silica dust. The MSDS for the material should be reviewed before handling this material.

7.2.5 MYCELX FILTRATION SYSTEM

The MyCelx filtration system has three polymeric surfactant vessels. The first two vessels operate at 30 and 28 psig respectively. The pressure across the third vessel can decline to as low as 2 psig. At this point the filter cartridges have to be changed.

7.2.6 GRANULAR ACTIVATED CARBON (GAC)

The frequency of GAC change out is to be determined by testing the internal and external TOG after the first GAC train. When an indication that the GAC was not removing enough TOG, the media would be changed.

A joint maintenance/monitoring log should be kept to ensure all operational data and changes/responses are properly documented.

These guidelines are recommended as a minimum to ensure proper operation, health, safety and protection of the surrounding environment. If corporate or regional policies in effect or enacted require more stringent monitoring, the scope and schedule should be adjusted to meet these requirements.

7.3 OILY WATER TREATMENT PLANT (FOR VEHICLE WASH WATER) O & M PLAN

7.3.1 REGULAR MAINTENANCE AND MONITORING SCHEDULE

Regular system maintenance entails routine inspection of mechanical and electrical components. It is recommended that the system be inspected weekly to ensure that all components are in good working order. Spare parts lists will be included with the Operations and Maintenance Manuals, with critical spare parts and system expendables highlighted. Recommended stock quantities will also be given.

Operational maintenance is mainly comprised of waste removal and expendable replacement in addition to some preventative maintenance on mechanical components. Maintenance activities, locations and their recommended frequencies are given below.

TABLE 7-2: MAINTENANCE ACTIVITIES, LOCATIONS AND THEIR RECOMMENDED FREQUENCIES

Maintenance Task	Location	Frequency
Sludge Removal	Primary clarifier	Twice/week
Oil Removal	Waste oil storage	Weekly
De-emulsifier chemical refill (if applicable)	Chemical room	TBD
Sulfuric acid chemical refill (if applicable)	Chemical room	TBD
Alum chemical refill	Chemical room	TBD
Sodium hydroxide chemical Refill	Chemical room	TBD
Polymer chemical refill	Chemical room	TBD
Clay chemical refill	Chemical room	TBD
Filter Bag change-out	Media room	Daily
Organoclay change-out	Media room	Every two month
Carbon change-out (both)	Media room	Every two month
Pump seals	Various	Annually

Additional, non-routine maintenance will be required throughout the life of the equipment. The recommended spare parts list and appropriate site stock levels are designed to keep the system running continuously with only scheduled downtime.

In addition to maintenance, monitoring the system performance and effluent quality are also necessary. It is further recommended that a flow totalizer be used at the effluent discharge to accurately summate the volume of treated water being released. This in conjunction with the quality data from the various system flows will allow forecasting for media and consumable change-out as well as waste oil and sludge generation. Residual contaminants below the regulatory limits can also be used in conjunction with treated volumes to determine area loadings over certain periods of time.

Monitoring tasks, locations and frequencies are listed in the table below. The prefix, GI, in the task column denotes “General Inspection”.

TABLE 7-3: MONITORING TASKS, LOCATIONS AND FREQUENCIES

Monitoring Task	Location	Frequency
GI – Clarifier (levels, appearance, pump operation)	Primary clarifier	Daily
Sample – Clarifier	Primary clarifier	Quarterly/Monthly
GI – OWS (levels, appearance, dosing pump)	OWS room	Daily
Sample – OWS Inlet	OWS room	Quarterly/Monthly
GI – Chemical Treatment (tanks, totes, levels, appearance, mixers, dosing pumps, effluent pump, pressures)	Chemical room and Lamella plate clarifier room	Daily
Sample – Chemical treatment inlet	Tank 1 – Lamella plate clarifier room	Quarterly/Monthly
Sample – Chemical treatment effluent	Pump outlet – Lamella plate clarifier room	Quarterly/Monthly
GI – Bag Filtration (units, pressures)	Media room	Daily
GI – Media Vessels (units, pressures, backwash pump, treated water storage)	Media room	Daily
Sample – Organoclay effluent	Media room – post organoclay	Quarterly/Monthly
Sample – Primary carbon effluent	Media room – post Primary carbon	Quarterly/Monthly
Sample – Effluent water	Media room – effluent water storage tank	Quarterly/Monthly
GI – Miscellaneous (vertical heaters, air compressors, air dryers, controls)	Various	Daily

A joint maintenance/monitoring log should be kept to ensure all operational data and changes/responses are properly documented.

The monitoring guidelines are recommended as a minimum to ensure proper operation, health, safety and protection of the surrounding environment. If corporate or regional policies in effect or enacted require more stringent monitoring, the scope and schedule should be adjusted to meet these requirements.

8 CONTINGENCY MEASURES

Design criteria for the potable, sewage and oily water treatment systems have been reviewed and revised to provide additional safety factor.

The sewage treatment systems will set back sufficiently from surface water bodies. The sewage treatment systems will be fully enclosed units. In the event of a spill of untreated or partially treated sewage from these facilities, Baffinland will follow the procedures in its spill response plan. Sewage spills are treated the same as more immediately hazardous hydrocarbon based spills.

9 SAMPLING, MONITORING, AND REPORTING

Generally, sampling and monitoring of the potable and wastewater treatment systems will include the following:

- Regular sampling of sewage and wastewater discharge in accordance with water licence requirements.
- More frequent internal process sampling (minimum once per week) and monitoring (daily) to identify potential upset conditions early that could lead to non-compliance.
- Record of volumes of sewage and wastewater effluent discharged and sludge generated in accordance with water licence requirements.
- Completion of daily checklists related to the O & M requirements for the facilities and the reporting of any upset conditions that require action.
- Aquatic effects monitoring program to confirm/validate environmental predictions.

The monitoring program will identify upset conditions related to the sewage treatment plants which will be immediately reported to the Camp Manager for corrective action.

9.1 POTABLE WATER SYSTEM MONITORING

Untreated Fresh water will be sampled or in accordance to final established potable water take locations. Treated potable water will be sampled from the potable treatment plant effluent.

Samples shall be collected at every active water take location for select analyses at frequencies specified in applicable regulations/guidelines. A typical list of parameters to be tested includes the following:

Calcium, Magnesium, Sodium, Potassium, Aluminum, Arsenic, Boron, Barium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Vanadium, Zinc, Tin, pH, Conductivity, Alkalinity as CaCO3, TDS (COND-CALC), TSS (total suspended solids), Turbidity, Phenols, N-NH3, SO4, Cl, Br,N-NO2, N-NO3, NO2 + NO3 as N, Mercury, Hardness as CaCO3, COD (chemical oxygen demand), Oil and Grease

A comparison of the sampling results to the Guidelines for Canadian Drinking Water Quality (GCDWQ) will be completed.

9.2 SEWAGE TREATMENT SYSTEM MONITORING

Treated sewage effluent will be monitored and sampled at proposed locations specified in the Aquatic Effects Monitoring Framework, Schedule 4 (February 2013), and Type A Water Licence (2AM-MRY1325). The proposed effluent discharge criteria was summarized in Table 5.2

9.3 OILY WATER TREATMENT SYSTEM MONITORING

Treated oily water effluent will be monitored and sampled at proposed locations specified in the Aquatic Effects Monitoring Framework, Schedule 4 (February 2013), and Type A Water Licence (2AM-MRY1325).

10 ENVIRONMENTAL RESPONSIBILITIES

10.1 ROLES AND RESPONSIBILITIES

The Baffinland Environmental Team is organised 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 10-1 below. Communication channels are described as liaisons in the tables outlining the responsibilities and accountabilities in the following sections.

10.1.1 ENVIRONMENTAL PROJECT TEAM

10.1.1.1 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 10-1.

TABLE 10-1: BAFFINLAND IRON MINES CORPORATION SENIOR MANAGEMENT

Baffinland Iron Mines Corporation Senior Management	
Position	**Responsibilities and Accountabilities**
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 - 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 VP Operations - Accountable for procurement and purchasing - Ensure that environmental commitments, policies and objectives are included in all contract documents
VP Corporate and Government 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 - Community liaisons report to position

The Baffinland Environmental Team will oversee all environmental activities on site. These responsibilities on site are outlined in Table 10-2.

TABLE 10-2: BAFFINLAND IRON MINES CORPORATION ON-SITE MANAGEMENT TEAM

Baffinland Iron Mines Corporation On-Site Management Team	
Position	**Responsibilities and Accountabilities**
Environmental Manager	- Reports to VP Sustainable Development, Health, Safety and Environment - Liaises with the VP Operations, any Construction Managers and the Emergency Response Team - Monitors environmental performance of contractors on site - Monitors compliance with permits, licenses and authorizations - Regulatory environmental monitoring and reporting (monthly, annual) - Routine audit of contractor's environmental performance on-site - Initiate/supervise environmental studies - Investigate and reports on accidents and incidents when they occur - Liaises with regulatory inspectors - Review and update environmental management plans
Environmental Superintendent	- Reports to Environmental Manager - Specific accountabilities for environmental monitoring and reporting - Assists in providing induction and environmental awareness information to trainers who conduct orientations to new employees and contract workers
Environmental Coordinators, Advisors and Technicians	- Reports to the Environmental Superintendent - Environmental database management - Various sampling, monitoring and reporting activities as required by permits, licenses and environmental management plans - Prepare updates to environmental protection plan and management plans
Environmental Monitors	- Reports to the Environmental Superintendent - Conduct monitoring activities as per the Environmental Management Plans
QIA Monitors	- Various monitoring and follow up activities - Role defined in the IIBA agreement - Liaises with QIA and attends applicable meetings

10.2 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, 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:

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

10.3 COMMUNICATION

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

a. Formal written correspondence and meetings with stakeholders.
b. Site visits by community representatives.
c. Design, construction and planning meetings.
d. Field inspections and monitoring reports disseminated by the Environmental Manager.
e. Electronic communications.
f. Tailgate/toolbox meetings.
g. Formal written correspondence and meetings with government regulatory bodies.
h. 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.

10.4 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.

10.5 CONSTRUCTION

During the construction phase of the Project, the Baffinland Environmental Manager 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.

10.6 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.

10.7 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 10-1 Organization Chart below:

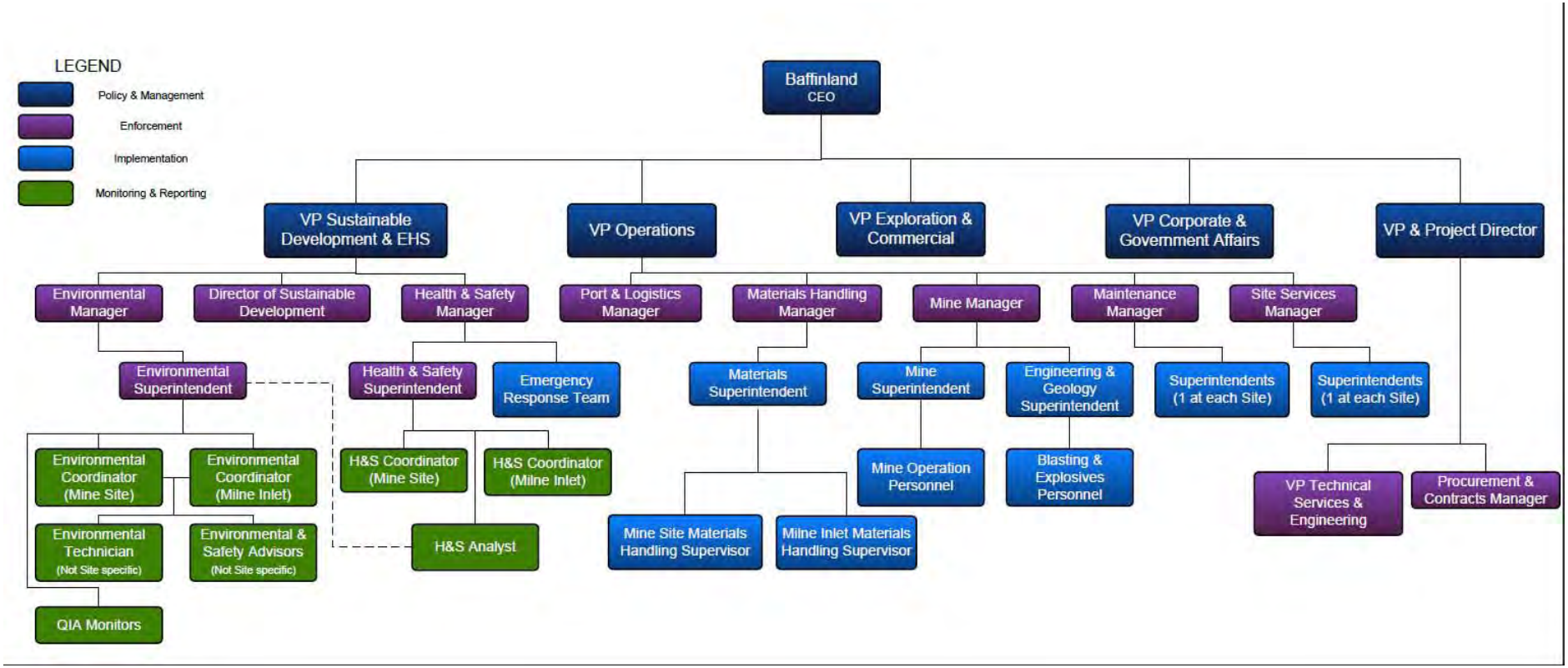


FIGURE 10-1: ORGANIZATIONAL CHART

Appendix A -
Table of Concordance with NIRB Project Certificate and Type A Water Licence (2AM-MRY1325)

Table A-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 Freshwater Supply, Sewage and Wastewater Management plan.

Part	Number	Condition	Section
B	15c	The Licensee shall update and revise, for submission to the Board for review, within sixty (60) days of issuance of this Licence, the following management plans. The updates are to take into account commitments made with respect to submissions received during the preliminary and technical review of the Application documents, as well as final submissions and issues raised during the Public Hearing Process, where applicable. Baffinland Iron Mines Corporation Mary River Project Attachment 5: Fresh Water Supply, Sewage and Wastewater Management Plan Appendix 10D-3, dated January 2012;	Plan has been updated from March 2013 Version to incorporate conditions of Type A Water Licence (2AM-MRY1325)
D	2	The Licensee shall submit to the Board for review and acceptance, at least sixty (60) days prior to construction or in a timeframe otherwise approved by the Board in writing, final design and for-construction drawings, stamped and signed by a Professional Engineer, for all infrastructure and/or facilities designed to contain, withhold, divert or retain Water and/or Waste including the following: - Bulk Fuel Storage Facilities - Explosives Facilities - Incineration Systems - Landfarm Facility - Oily Water and/or Wastewater treatment Facilities - Sewage Treatment Facilities - Site Drainage and Surface Water Management Systems - Waste Management Facilities (including temporary and permanent structure for hazardous and non-hazardous waste) - Water Supply Facilities - Water crossings including, pipelines, bridges, and roads - Water course training, flood control, diversions	60 days prior to construction If more immediate timeline required, will issue letter to NWB with early drawings

<table>
<tr><th>Part</th><th>Number</th><th>Condition</th><th>Section</th></tr>
<tr><td>D</td><td>3</td><td>The Licensee shall submit to the Board for approval, at least sixty (60) days prior to completion of construction, an addendum to the Fresh Water Supply, Sewage and Wastewater Management Plan that addresses operational aspects of the Sewage Treatment Facilities and Wastewater Treatment Facilities, prepared in accordance with the “Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories, 1996”, where applicable. This Manual shall include contingency measures in the event of facility malfunction, disposal of sludge and any other operational and maintenance procedures for those facilities.</td><td>Appendix D</td></tr>
<tr><td>E</td><td>3</td><td>The Licensee shall obtain all fresh Water for domestic camp use and industrial purposes,
during the Construction Phase of the Project, in the amount and from the sources as listed in following table, or from sources otherwise approved by the Board in writing. In addition to the source-specific limits prescribed in the table, the Licensee shall not exceed one thousand five hundred and eighty-nine (1,589) cubic metres per day or five hundred and eighty thousand (580,000) cubic metres per year total water use from all sources during the Construction Phase of the Project.
<table>
<tr><th>Site</th><th>Source</th><th>Volume</th><th>Combined Volume</th></tr>
<tr><td>Milne Port
(Milne Inlet)</td><td>Phillips Creek (summer)
Km 32 Lake (winter)</td><td>68.5 m3/day</td><td>25,000 m3/year</td></tr>
<tr><td>Mine Site
(Mary River)</td><td>Camp Lake</td><td>657.5 m3/day</td><td>240,000 m3/year</td></tr>
<tr><td>Steensby Port (Steensby Inlet</td><td>ST 347 Km Lake
3 km Lake</td><td>435.8 m3/day</td><td>155,400 m3/year</td></tr>
<tr><td>Ravn River</td><td>Camp Lake</td><td>145.2 m3/day</td><td></td></tr>
<tr><td>Mid-Rail</td><td>Nivek Lake (summer)
Ravn Camp Lake (winter)</td><td>79.5 m3/day</td><td></td></tr>
</table></td><td>Table 4-1</td></tr>
<tr><td>E</td><td>5</td><td>The Licensee may recycle water and use reclaimed water from the various Treatment Facilities, surface water management ponds and embankment dams and approved discharge locations under the licence if such waters meet appropriate discharge criteria for those facilities.</td><td>5.2</td></tr>
</table>

Part	Number	Condition	Section
E	6	The Licensee shall equip all Water intake hoses with screens of an appropriate mesh size, consistent with the requirements of Fisheries and Ocean Canada's (DFO) Freshwater Intake End-of-Pipe Fish Screen Guidelines (1995), to prevent the entrainment of fish are and shall withdraw Water at a rate such that fish do not become impinged on the screen.	4.1.1.2
E	8	Streams cannot be used as a water source unless authorized and approved by the Board in writing.	4.2
E	10	The Licensee shall update or revise annually following the commencement of the Operations Phase, the Project Blockflow Diagram Water Supply Balance information for the various Project sites, provided with the Application and submit for review of the Board. The submission shall be included with the Annual Report under Part B, Item 4.	The Plan is updated to include the planned construction numbers as well as the 2014 work plan.-Updates will be provided as required to include the Operations Phase
E	12	The Licensee shall not remove any material from below the ordinary High Water Mark of any water body unless authorized.	4.2
F	10	The Licensee shall treat oily water and wastewater generated by the Project at the Oily Water/Wastewater Treatment Facilities allowed under the scope of the Licence.	6.3
F	13	The Licensee shall, unless otherwise approved by the Board in writing, discharge effluent at a distance of least thirty-one (31) metres above the Ordinary High Water Mark of any Water body, where direct flow into the Water body is not possible, such that surface erosion is minimized and no additional impacts are created.	
F	15	The Licensee shall direct all Sewage generated from the relevant Project sites to the Sewage Treatment Facilities or as otherwise approved by the Board in writing.	5.2
F	16	The Licensee shall treat all Sewage waste generated at the Ravn River and Mid-Rail camps and Sewage generated at the Cockburn North and Cockburn South camps at either the Mine Site Sewage Treatment Facility or the Steensby Port Sewage Treatment Facility, unless otherwise approved by the Board in writing.	Appendix E

<table>
<tr><th>Part</th><th>Number</th><th>Condition</th><th>Section</th></tr>
<tr><td>F</td><td>18</td><td>All discharge from the Sewage Treatment Facilities including the Polishing Waste Stabilization Ponds directly into fresh Water bodies at Monitoring Stations MP-01, MP-01a, MP-MRY-04, MP-MRY-04a, MS-01, MS-01a, MS-MRY-04, MS-MRY-04a, must not exceed the following Effluent quality limits
<table>
<tr><th>Parameter</th><th>Maximum Concentration of Any Grab Sample</th></tr>
<tr><td>BOD5</td><td>30 mg/L</td></tr>
<tr><td>Total Suspended Solids</td><td>35</td></tr>
<tr><td>Faecal Coliform</td><td>1000 CFU/100 mL</td></tr>
<tr><td>Oil and Grease</td><td>No visible sheen</td></tr>
<tr><td>pH</td><td>Between 6.0 and 9.5</td></tr>
<tr><td>Ammonia (NH3-N)</td><td>4.0 mg/L</td></tr>
<tr><td>Total Phosphorous (MS-01)</td><td>4.0 mg/L</td></tr>
<tr><td>Total Phosphorous (MS-01a)</td><td>1.0 mg/L</td></tr>
<tr><td>Toxicity</td><td>Not acutely toxic</td></tr>
</table></td><td>Table 5.2</td></tr>
<tr><td>F</td><td>19</td><td>All discharge from the Sewage Treatment Facilities including Polishing Waste Stabilization Ponds at Monitoring Stations SP-01, SP-01a directly into the ocean or to ditches flowing into the ocean shall not exceed the following Effluent quality limits:
<table>
<tr><th>Parameter</th><th>Maximum Concentration of Any Grab Sample (mg/L)</th></tr>
<tr><td>BOD5</td><td>100 mg/L</td></tr>
<tr><td>Total Suspended Solids</td><td>120 mg/L</td></tr>
<tr><td>Faecal Coliform</td><td>10,000 CFU/100 mL</td></tr>
<tr><td>Oil and Grease</td><td>No visible sheen</td></tr>
<tr><td>pH</td><td>Between 6.0 and 9.5</td></tr>
<tr><td>Toxicity</td><td>Not acutely toxic</td></tr>
</table></td><td>Table 5-2</td></tr>
<tr><td>F</td><td>20</td><td>Sludge generated from the Sewage Treatment Facilities or any other facilities shall be confirmed to be non-hazardous and the results provided to the Board for review prior to disposal at any Landfill Facility or as otherwise approved by the Board in writing.</td><td>5.2</td></tr>
</table>

<table>
<tr><th>Part</th><th>Number</th><th>Condition</th><th>Section</th></tr>
<tr><td>F</td><td>21</td><td>All discharge from the Oily Water/Wastewater Treatment Facilities at Monitoring Stations MP-02, MS-02, SP-02 must not exceed the following Effluent quality limits:
<table>
<tr><th>Parameter</th><th>Maximum Average Concentration (mg/L)</th></tr>
<tr><td>pH range</td><td>6 – 9.5</td></tr>
<tr><td>TSS</td><td>35</td></tr>
<tr><td>Ammonia</td><td>4</td></tr>
<tr><td>Phosphorous</td><td>4</td></tr>
<tr><td>Benzene</td><td>0.370</td></tr>
<tr><td>Ethylbenzene</td><td>0.090</td></tr>
<tr><td>Toluene</td><td>0.002</td></tr>
<tr><td>Oil and Grease</td><td>15 and no visible sheen</td></tr>
<tr><td>Arsenic</td><td>0.50</td></tr>
<tr><td>Copper</td><td>0.30</td></tr>
<tr><td>Lead</td><td>0.20</td></tr>
<tr><td>Nickel</td><td>0.50</td></tr>
<tr><td>Zinc</td><td>0.50</td></tr>
</table></td><td>Table 6-1</td></tr>
<tr><td>F</td><td>22</td><td>All discharge from the Landfill Facilities at Monitoring Stations MS-MRY-13a, MSMRY-13b and SP-08 must not exceed the following Effluent quality limits:
<table>
<tr><th>Parameter</th><th>Maximum Average Concentration (mg/L)</th></tr>
<tr><td>pH</td><td>6.0-9.5</td></tr>
<tr><td>Total As</td><td>0.5</td></tr>
<tr><td>Total Cu</td><td>0.3</td></tr>
<tr><td>Total Pb</td><td>0.2</td></tr>
<tr><td>Total Ni</td><td>0.5</td></tr>
<tr><td>Total Zn</td><td>0.5</td></tr>
<tr><td>Total Suspended Solids</td><td>15</td></tr>
<tr><td>Oil and Grease</td><td>No</td></tr>
</table></td><td>Table 5-4</td></tr>
<tr><td>F</td><td>23</td><td>All discharge from the Bulk Fuel Storage Facilities at Monitoring Stations MP-03, MPMRY-7, MS-03, MS-04, MS-MRY-6, SP-04 and SP-05 must not exceed the following Effluent quality limits:
<table>
<tr><th>Parameter</th><th>Maximum Concentration of Any Grab Sample (ug/L)</th></tr>
<tr><td>Benzene</td><td>370</td></tr>
<tr><td>Toluene</td><td>2</td></tr>
<tr><td>Ethylbenzene</td><td>90</td></tr>
<tr><td>Lead</td><td>1</td></tr>
<tr><td>Oil and Grease</td><td>15,000 and no visible sheen</td></tr>
</table></td><td>Table 5-5</td></tr>
</table>

<table>
<tr><th>Part</th><th>Number</th><th>Condition</th><th>Section</th></tr>
<tr><td>F</td><td>24</td><td>All discharge from the Landfarm Facilities at Monitoring Stations MP-04, MS-05 and SP-06 must not exceed the following Effluent quality limits:
<table>
<tr><th>Parameters</th><th>Maximum Average Concentration (mg/L)</th></tr>
<tr><td>pH</td><td>6.0-9.0</td></tr>
<tr><td>Total Suspended Solids</td><td>15</td></tr>
<tr><td>Oil and Grease</td><td>15 and no sheen</td></tr>
<tr><td>Total Lead</td><td>0.001</td></tr>
<tr><td>Benzene</td><td>0.370</td></tr>
<tr><td>Toluene</td><td>0.002</td></tr>
<tr><td>Ethylebenzene</td><td>0.090</td></tr>
</table></td><td>Table 5-6</td></tr>
<tr><td>F</td><td>25</td><td>All discharge from the Bulk Sample Open Pit, Bulk Sample Weathered Ore Stockpile, Bulk Sample Processing Stockpile Area and Bulk Sample Stockpile Area Seepage at Monitoring Stations MS-MRY-09, MS-MRY-10, MS-MRY-11, MP-MRY-12 shall not exceed the following Effluent quality limits:
<table>
<tr><th>Parameter</th><th>Maximum Concentration of Any Grab Sample (mg/L)</th></tr>
<tr><td>Total Arsenic</td><td>0.50</td></tr>
<tr><td>Total Copper</td><td>0.30</td></tr>
<tr><td>Total Lead</td><td>0.20</td></tr>
<tr><td>Total Nickel</td><td>0.50</td></tr>
<tr><td>Total Zinc</td><td>0.50</td></tr>
<tr><td>Total Suspended Solids</td><td>15.0</td></tr>
<tr><td>Oil and Grease</td><td>No visible sheen</td></tr>
<tr><td>Toxicity</td><td>Not acutely toxic</td></tr>
<tr><td colspan="2">The waste discharge shall have a pH of between 6.0 and 9.5</td></tr>
</table></td><td>Table 5-7</td></tr>
<tr><td>F</td><td>26</td><td>All discharge from the Ponds associated with the Run of Mine Ore Stockpile, Ore Stockpile, West and East Sediment Ponds at Monitoring stations MS-06+, MS-07, MS-08 MS-09 and SP-07 shall not exceed the Effluent quality limits of Part F, Item 25</td><td>5.3 and Table 5-7</td></tr>
</table>

Appendix B -
2014 Work Plan and Updated Site Layouts

WORK PLAN

2014

31 October 2013

Table of Contents

1. INTRODUCTION

The following document presents the 2014 Work Plan as required under Section 6.1 of the Commercial Lease, No. Q13C301, agreed between Baffinland Iron Mines Corporation and the Qikiqtani Inuit Association. Additionally, this document is a requirement under the Type A Water Licence 2AM-MRY1325 for the purposes of an Annual Security Review for activities undertaken on an annual basis. In the event the Project does not advance, all work items described and constructed as per the 2014 Work Plan will be subject to reclamation, as per relevant regulatory and permit obligations.

Given that the proposed Early Revenue Phase (ERP) is currently under review, this document separates out activities that may occur if the ERP is approved, separate from activities that are planned to proceed as part of the approved Project. In order to align this document with the structure defined within the Commercial Lease, wording in italicized blue throughout this document is used to highlight wording from the Commercial Lease.

2. 2014 WORK PLAN

2.1 2014 SCOPE OF WORK

The Tenant shall provide: *"A description of the Operations and Work that the Tenant expects to perform in the next Year, and an identification of the Lands, within existing or proposed Land Use Areas that are to be specifically identified within the Property, where such Operations and Work shall occur"*

This 2014 Work Plan provides for:

1. The continued development and construction of infrastructure required at Milne Port and the Mine Site for the Mary River Project.
2. For Milne Port, it is expected that sealifts will occur during open water (approximately between July 15th and October 1st 2014). An estimated 7 vessels (dimension of barges approximately 35 m x 140 m) will be necessary to transport the equipment and material required for the execution of the 2014 Work. Material, equipment, fuel and supplies required for construction activities at the Mine Site and the operation of the Mary River facilities will be transported to the Mine Site via the Tote Road year round.
3. Ongoing environmental baseline data collection and geotechnical drilling in order to sustain the development of the Project will continue. These activities will resume at the Milne Port site, along the Tote Road, at the Mine Site, at numerous quarry sites and at other Project development areas.
4. Continual environmental monitoring in accordance with the approved environmental management monitoring and mitigation plans.
5. Continued archaeological surveys at project component areas as required.

There will be continued progressive reclamation of areas of current and past use in association with drilling, bulk sample, and historical exploration programs. In addition, progressive reclamation plans will include:

- Implementation of an action plan, developed and submitted in 2013, to address concerns from stakeholders about long term salt storage;
- Implementation of a program to dispose of existing inventory incinerator bottom ash in the existing Mary River Landfill and the development of a plan to manage and dispose of ash being generated on an ongoing basis;
- Completion of the ongoing decommissioning of the existing bladder farm at Milne Inlet. Work includes the transport of hydrocarbon impacted soils to the planned landfarm facility;
- Commence decommissioning of the existing Mary River bladder farm;
- Continue the development and implementation of a long term multi-year plan to address localized areas of permafrost melting associated with current borrow areas, and taking into consideration the longer term designs for the Tote Road upgrades and new quarry development;
- 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;
- Continued development of the Mine Site landfill and deposition of non-hazardous wastes in accordance with the landfill operations and maintenance manual; and,
- Discharge of treated sewage stored in existing PWSPs at the Mary River Camp and Milne Inlet after treatment as required. Two periods of discharge are planned, the first corresponding to freshet (May-June), and the second later in the summer if required.
- Ongoing removal from the site, or safe disposal on-site of infrastructure, equipment and supplies no longer required for ongoing construction and operations. The items are defined by the Mary River Project Interim Abandonment and Reclamation Plan, and include infrastructure and site materials, fuel caches, drums, barrels, buildings and contents, docks, water pumps and lines, material and equipment prior to the expiry of applicable permits. Where required, internal roads will be re-graded to restore natural drainage to reduce erosion.
- Unless otherwise identified within the approved Abandonment and Reclamation Plan under this Licence, where roads are no longer in use, Baffinland will remove culverts and open the natural drainage channel. In carrying out this activity, measures will be implemented to minimize erosion and sedimentation.
- Areas that have been contaminated by hydrocarbons from normal fuel transfer, handling and storage activities will be reclaimed to meet objectives as outlined in the Government of Nunavut's Environmental Guideline for Site Remediation, 2010. The use of reclaimed soils for the purpose of 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.

The Work Plan is presented within the context of the applicable regulatory authorizations and schedule. Baffinland holds, or will soon hold, all the permits and authorizations required to carry out the 2014 Work Plan. The main regulatory instruments that allow for the 2014 Work Plan activities include:

- Project Certificate No. 005
  - All works and activities proposed have been screened by the NIRB and have been considered in the Project Certificate issued by the NIRB on December 28, 2012.
- Type A Water Licence (2AM-MRY1325)
  - All works and activities planned for 2014 are within the scope of the licence.
- Type B Water Licence (2BB-MRY1114)
  - The renewed Type B Water Licence (application to be submitted in November 2013) will authorize Baffinland to undertake mineral exploration activities, geotechnical and exploration drilling programs, construction of ice roads, ongoing operation, maintenance and upgrades to existing pioneer camps at Steensby Inlet and Mid Rail, construction of airstrips on lakes for winter months and potential bulk sampling.
- Quarry Permits
  - Schedule 'B' Quarry Concession Agreement under IOL Commercial Lease New Lease, Q13C301.
  - It is anticipated that quarrying of rock and gravel from permitted quarry locations (as shown on Schedule "A1") of the IOL Commercial Lease will continue. In addition, Baffinland will be applying for access and quarry permits to extract rock and gravel material adjacent and near the existing Milne Inlet Tote Road by means of an Amendment to the existing Schedule 'B' to the Lease.
  - New quarries are needed at the following locations:
    1. Q7, Tote Road Station 5+560,
    2. Q11, Tote Road Station 28+400,
    3. P1, Tote Road Station 86+000,
    4. Q19, Tote Road Station 163+500
    5. Deposit No. 1 Quarry 2 (D1Q1), Haul Road Station 6+540
    6. Deposit No. 1 Quarry 1 (D1Q2), Haul Road Station 2+000
- Ongoing operation of existing borrow source areas adjacent to Tote Road at Km 2 (formerly borrow source no. 1), and Km 97 (formerly borrow source no. 3).

- The construction of access roads from the Tote road will be necessary to access quarry locations. Where it is necessary, culvert crossings will be installed along the access roads.
- AANDC Land Use Permit and Quarry Permit to access existing and possibly new borrow and rock quarries adjacent and near the Tote Road (currently covered under the Class A Crown Land Use Permit, N2007F004, and Quarry Permit, 2013QP0086).

Appendix A includes layouts H349000-1000-00-015-0001, H349000-1000-00-015-0002, H349000-1000-00-015-0003 and H349000-1000-00-015-0004.

2.2 INFRASTRUCTURE AND CONSTRUCTION WORKS

The Tenant shall provide: *"A description of the topographical features and any natural or manmade features, structures or works that may be affected by the Tenant's Operations and Work within existing or proposed Land Use Areas that are to be specifically identified within the Property;"*

Construction activities forecast for 2014 under Project Certificate No. 005 include:

Milne Inlet

During the sealift, most of the activities at Milne Port will focus on unloading the barges and positioning received equipment and material in designated laydown areas. In addition, the following construction activities will continue:

- Continue to install Project Wide Communication and IT Infrastructure;
- Construct remaining earth/rock fill for laydown areas, the concrete batch plant pad, and local site roads within the Milne site not completed in 2013;
- Construct rip-rap lined rock fill embankment for Ramp to the Beach;
- Install Emergency Services building;
- Install services maintenance buildings including the Concrete Batch Plant Building, Milne Maintenance Building, Milne Workshop office, Milne Welding Shop and workshop office;
- Install Power and Generation systems;
- Construct and commission one 12 ML diesel fuel Storage Tank and one 750,000 L Jet A fuel Storage Tank;
- Install concrete floor slab on grade at the Sewage Treatment Truck Building, Welding Shop and Maintenance Building;
- Construct Hazardous Waste Containment Area(s) for storage of hazardous wastes;
- Construct the Waste Disposal Land Farm, contaminated snow dump and containment pad;
- Install Servicing Buildings E-Houses;

- Install Power Supply and Distribution for Warehouses;
- Install Electrical Devices for Batch Plant Building.

Tote Road

All equipment, material, fuel, and supplies required for construction and operation activities at Mary River will be transported from Milne Port to the Mine Site via the Tote Road.

The upgrade of the road commenced late in 2013 and is expected to take 8 to 10 months. During 2014 the activities associated with the upgrade to the Tote Road include;

- Improvements;
- Reduce maximum slopes,
- Increase turn radius;
- Increase culvert size where required;
- Modify and/or upgrade water crossings (culverts and bridges), including of removal of sea-can bridges;
- Installation of culverts as required;
- Crush material as required, haul, place and compact new rock fill per design;
- Installation and maintenance of erosion control devices;
- Construct ditches with rip rap as required;
- Commence the development of Quarries Q7, Q11, Q19 and borrow pit P1 to provide access to aggregate for upgrades;
- Drill, blast and excavate as required to reduce steep grades and improve curves where necessary and to improve sight distance and visibility along the road;
- Construct abutment and approach areas at river crossings; and
- Install four single span bridges.

Mine Site

Construction activities at the Mine Site will consist of:

- Construct, install and grade Waste Rock Haul Road, Waste rock pad, drainage ditches and settling pond;
- Construct crusher pad, ore stockpile pad area, drainage ditches and settling pond for mining operations;
- Receive mobile equipment for materials handling, maintenance and site services;
- Install and commission emulsion plant;
- Construct Pit 1 Haul Road ;

- Commence development of the preliminary Deposit One pit benches;
- Installation of a pit office facility at a temporary location and dismantling of same later in the year;
- Install and construct permanent Pit Office Building;
- Set up crushing and screening mobile equipment;
- Install truck weigh facility;
- Erect and install concrete batch plant;
- Upgrade (extend) the Mary River airstrip;
- Install aerodrome office, field electrical center, airfield lighting and visual aids as well as power generation and fuel supply systems;
- Installation and commissioning of Services Buildings including maintenance shop, warehouse, welding shop, workshop and washcar buildings;
- Installation of temporary facilities referred to above until the permanent ones are available for use, dismantle temporary locations when no longer needed;
- Install power generation systems;
- Continued development of the quarry QMR2 at Mine Site and commence development of quarries D1Q1 and D1Q2;
- Transfer fuel from Milne Port tank farm to newly installed fuel tank farm at the Mine Site.

Construction activities associated with the Early Revenue Phase

As stated in correspondence to the NIRB on January 13, 2013, due to various business drivers, Baffinland proposes to make changes to the schedule and some activities in the initial stages of project development associated with the Mary River Project Proposal for which the NIRB issued Project Certificate No. 005 (the 'Project Certificate').

In its request to the NIRB, Baffinland indicated that although the Proponent remains committed in the long-term to developing the Project as authorized in the Project Certificate, in the short term Baffinland proposes to change some development activities and project timelines to accommodate a proposed "Early Revenue Phase" which would include development of a nominal 3.5 million tonnes per annum (Mt/a) road haulage operation from the Mary River mine site to a port facility at Milne Inlet for shipping of iron ore during the open water season. As noted by Baffinland, this development option was presented previously as a project alternative, and was included within the initial technical review of the Draft Environmental Impact Statement for the Mary River Project Proposal.

Baffinland recognizes that this Early Revenue Phase (ERP) will require an amendment to the Project Certificate which in turn requires the submission and review of an Environmental Impact Statement. In accordance to the directives issued by the NIRB, Baffinland completed its Environmental Impact

Statement for the Early Revenue Phase of the Project in June 2013. The proposal is subjected to the NIRB review process which is expected to be completed by the first quarter of 2014.

Once a favourable decision is granted from the Minister of AANDC with respect to the ERP, and subject to obtaining any amendments (if any) which might be necessary to the Water Licence, Baffinland will proceed with the construction of facilities required for the completion of the ERP.

Construction activities for the ERP, which would only commence if and once the addendum to the FEIS is granted, consist of the following activities at Milne Port:

- Construct a causeway and ore dock that will extend into offshore waters. The causeway and ore dock platform with be built up with aggregate and suitable dredged material;
- Dredging, as required, to maintain the required vessel draft depths and for placement of caissons, in the location of the dock. Dredge material to be deposited near shore in an area demarcated for this activity adjacent to the causeway location. If dredge material is not suitable for re-use to build up the causeway, then the dredge material will be deposited near shore in an area demarcated for this activity. As a preventative measure, a silt curtain will be installed around the extent of the dredging activities;
- Construct concrete and steel pile foundations onto the rock filled causeway and ore dock to support the ship loader and related ship loader facilities;
- Install 2 mooring buoys or dolphins;
- Install and commission the ship loader onto the ore dock foundations. This work is expected to continue into 2015;
- Construct and commission ore stockpile pad;
- Install and commission the ore stacker reclaim conveyor system within the ore stockpile pad;
- Construct Stockpile settling ponds.

2.3 INFRASTRUCTURE LAYOUT AT END OF 2014

The Tenant shall provide: *"A detailed description of planned construction and infrastructure changes, additions or removals within the boundaries of the Impact Areas and the Exploration Areas, either permanent or temporary;"*

Site layouts for Milne and Mary River can be found in Appendix B of this document.

2.4 MINING, QUARRYING AND EXPLORATION ACTIVITIES

The Tenant shall provide: *"A description of any and all mining and exploration activities planned for the year, including:*

i. Exploration activity and drilling plan,

During 2014 Baffinland anticipates the approval for a renewal to the Type B Water Licence (2BB-MRY1114). All activities listed under this renewal have been permitted in the past and are common to exploration properties throughout Nunavut.

The scope of the Type B Licence allows for Baffinland to continue/undertake the following activities on its mineral leases in the Qikiqtani Region of Nunavut.

- Mineral exploration drilling;
- Surface mineral exploration activities including mapping, sampling, geophysical surveys, geochemical surveys, mechanical trenching and stripping of surficial overburden;
- Geotechnical drilling programs and surveys at project development areas, as required to support Project design requirements;
- Port site(s), with land based drilling as well as possible barge based and ice based drilling on the sea ice at Milne Port. A platform for the geotechnical and geophysical testing may be barge based or a platform built up on the ice;
- Activities in support of scientific and engineering studies related to the advancement of future expansion of the Mary River Project;
- Ongoing operation, maintenance and upgrades to existing pioneer camps at Steensby Inlet and Mid-Rail location:
  - Steensby Inlet Camp: Latitude 70 ^{o} 17’ 40” Longitude 78 ^{o} 29 15”
  - Mid-Rail Camp: Latitude 70 ^{o} 58’ 20” Longitude 78 ^{o} 22’ 15”
- Potential seasonal occupation of Steensby Inlet and Mid-Rail Camps;
- Potential for establishing future satellite camps to support exploration and drilling activities (amendment of licence would be required) on Baffinland’s mineral claims;
- Future Bulk Sampling Program;
- Fixed wing aircraft and helicopter to support general site activities including environmental monitoring and potentially additional exploration drilling and regional exploration;
- Construction and use of airstrips on lakes for winter months;
- Use of float planes on lakes during the summer months;
- Construction of winter roads, stream/river crossings;
- Sealift operation and establishment and use of laydown areas;
- Progressive reclamation programs associated with exploration program;
- Waste rock disposal areas.

ii. An estimate of the amount and type of ore and waste to be mined in each month,

During 2014 Baffinland anticipates commencing the mining of ore during October 2014. Below is an estimate of the breakdown of ore vs. waste mined by month.

Table 2-1: Mine Forecast 2014

Month	Ore Mined (wmt)	Waste Mined (wmt)	Total Mined (wmt)
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	250,000	250,000
July	0	250,000	250,000
August	0	250,000	250,000
September	0	250,000	250,000
October	252,000	120,000	372,000
November	243,000	125,000	368,000
December	252,000	125,000	377,000
Total	**747,000**	**1,370,000**	**2,117,000**

iii. An estimate of the amount and type of ore to be shipped each month,

At this time, no ore is planned to be shipped in 2014, however should the ERP be approved, Ore will be hauled along the Tote Road and stockpiled at Milne Inlet.

iv. Expected quarterly quantities to be quarried of each Specified Substance including sand, gravel and construction stone, where possible, estimated by individual quarry site or borrow location;"

A summary of the expected quantities of quarried materials extracted during 2014 is provided per quarry below.

Table 2-2: 2014 Quarry and Borrow Pit Quantities

Quarry	Annual Volume (m^3)	Annual Surface Area (m^2)
Q1	690,000	92,000
Q7	75,000	14,600
Q11	175,000	17,500
P1 & other approved borrow sources	275,000	55,000
Q19	175,000	14,600
QMR2	250,000	70,000
D1Q1	275,000	27,500
D1Q2	700,000	22,500

2.5 SOLID WASTE DISPOSAL

The Tenant shall provide: *"Expected annual quantities of Solid Waste to be deposited in approved Waste Storage Areas;"*

The expected annual quantity of solid wastes to be deposited during 2014 can be found in the Waste Management Plan (H349000-1000-07-126-0007) for the Project and are provided in the table below.

Table 2-3: Estimated Domestic Solid Non Hazardous Waste Generation

Waste	Waste Description	Disposal Method	Est. Total Annual Production (tonnes)
2014 Work Plan			
Organic	Kitchens	Incinerator	568
Paper	Packaging/Offices	Incinerator/On-site landfill	168
Plastic	Offices/Camps	Incinerator[2]/On-site landfill	120
Cardboard	Packaging/Camps	Incinerator	128
Cloth	Camps	Incinerator	39
Multi-Material	Packaging/Camps	Incinerator/On-site landfill	28
Metal	Packaging	On-site landfill	17
Glass	Camps	On-site landfill	16
Wood	Packaging	Incinerator	11
Bottom Ash from Camp Incinerators	Historical Inventory of Ash plus on-going generation from new camp incinerators	On-site landfill	170

[1] Composition based in part on 2011 Mary River Waste Audit results (Aug 27 - Aug 29), Assume 50% of waste generated to be domestic.

[2] Poly-chlorinated plastics will be sorted out of waste stream and sent to landfill and will not be incinerated

[3] The disposal of incinerator bottom ash in the landfill will not proceed unless it is tested by an acceptable test procedure. If the composition of the ash makes it unsuitable for disposal at the Landfill facilities, the waste will be directed to an appropriate facility for disposal.

2.6 SPECIFIED SUBSTANCES

The Tenant shall provide: *"Expected uses of Specified Substances pursuant to a Quarry Concession Agreement that is existing or to be entered into by the Parties pursuant to this Lease;"*

Expected specified substances pursuant to the Quarry Concession Agreement can be seen in Table 2-2 of Section 2.4. These quarried materials will be utilized in the construction activities as detailed in Section 2.2.

2.7 WATER USE

The Tenant shall provide: *"Expected uses of water pursuant to a Water Compensation Agreement that is existing or to be entered into by the Parties pursuant to this Lease;"*

The existing Type A Water Licence 2AM-MRY1325 permits the maximum following water use for domestic and industrial purposes during construction phase of the Project.

Table 2-4: Water Use for Domestic and Industrial Purposes during Construction Phase

Site	Source	Volume	Combined Volume
Milne Port (Milne Inlet)	Phillips Creek (Summer)	68.5m³/day	25,000 m³/year
	Km 32 (Winter)		
Mine Site (Mary River)	Camp Lake	657.5 m³/day	240,000 m³/year
Steensby Port (Steensby Inlet)	ST 347 km Lake	345.8 m³/day	155,400 m³/year
	3 km Lake		

Source: Type A Water Licence, 2AM-MRY1325

2.8 MATERIALS SHIPPED OUT

The Tenant shall provide: *"Expected quantities of materials that will be shipped off the Property;"*

Expected quantities of materials planned to be shipped off site in 2014 are detailed in Table 2-5 and Table 2-6. Table 2-5 provides estimated hazardous waste and hazardous material quantities to be shipped off site during 2014 and is based on projections detailed in the Hazardous Material and Waste Management Plan for the Project with an additional allowance for decommissioned bladder farm materials. Table 2-6 details quantities of any additional material planned to be demobilized from site in 2014.

Table 2-5: Hazardous Waste Generation Estimate for 2014

Waste Category	Waste Description	Disposal Method	2014 Est. Generation (kg/person/ day)	Person Days On-Site	Est. Total Annual Production (tonnes)	Est. Total Annual Production (tonnes) with 20% Contingency
Construction Phase [1]						
Batteries	Misc.	Shipped off Site	0.125		14.93	17.92
Hydro Carbon Contaminated Material	Sludge, Absorbents, Oil Filters etc	Incinerated/Shipped off Site	0.288		34.30	41.16
Waste Oil	Maintenance	Incinerated/Shipped off Site	1.732		206.30	247.55
Waste Fuels	Maintenance	Incinerated/Shipped off Site	0.129		15.32	18.38
Waste Grease	Domestic/Maintenance	Incinerated/Shipped off Site	0.046	119082	5.42	6.51
Waste Hazardous Liquids	Other, Paint, Oily Water	Shipped off Site	0.561		66.86	80.23
Waste Aerosol Canisters	Misc.	Shipped off Site	0.004		0.43	0.51
Contaminated Containers/Solids	Various	Shipped off Site	0.447		53.25	63.89
Misc Hazardous Materials	Misc.	Shipped off Site	0.350		41.73	50.08
				TOTAL	**438.53**	**526.24**

NOTES

[1] Assume 450 people on site for 365 days during construction phase to remain conservative

[2] Assume 325 people on site for 365 days during operation phase to remain conservative

[3] Generation rate based on Mary River specific estimate. No contingency included

Table 2-6: Materials to be shipped out in 2014

Description	Equipment Type	Quantity
Winch Truck	Mobile equipment	1
Pick-up F350	Mobile equipment	9
Mechanic Truck F550	Mobile equipment	2
Bus	Mobile equipment	1
Fuel Truck	Mobile equipment	2
Roll-off / Vac Truck	Mobile equipment	2
Crane - 60 ton – with jib	Mobile equipment	1
Packer CS563	Mobile equipment	1
Skid Steer	Mobile equipment	2
Crusher and Screener unit	Crushing & Screening	1
Water Truck	Mobile equipment	1
Loader with bucket	Mobile equipment	5
Dozer D8T	Mobile equipment	2
Dozer D7R	Mobile equipment	1
Grader 16H	Mobile equipment	1
Grader 14H	Mobile equipment	1
Excavator 345C	Mobile equipment	2
Rock Truck 773E	Mobile equipment	2
Shop - Norseman 40'x60'	Structure	4
Compressor 375HD PQ - Trailer Mounted (S/B C250)	Mobile equipment	1
Light Tower 8 KW	Structure	8
Tanker Trailer 50,000L	Mobile equipment	2
Scissor Deck	Mobile equipment	1
Welder mounted on Trailer - Ideal Arc DC600	Mobile equipment	1
Office Trailer	Structure	2
49 Person Accommodation Complex	Structure	1
Sewage Treatment Plant	Structure	1
Duel Burner Incinerator	Structure	1
Sewage Holding Tank	Tank	1
Washroom / Lunchroom (Wheeled) (survival shack)	Shop / maintenance equipment	2
Seacan 20'	Container	36
Generator	Generator	3

2.9 MATERIALS SHIPPED IN

The Tenant shall provide: *"Expected quantities of materials that will be shipped to and stored on the Property;"*

At least two bulk fuel deliveries will occur during the 2014 sealift. At the onset of the shipping season, arctic diesel and Jet A fuel will be delivered to fill the newly constructed tanks at the Milne tank farm.

The anticipated fuel delivery is as follows:

Table 2-7: 2014 Anticipated Fuel Delivery

	Diesel	Jet A	Marine Diesel
Total Bulk Fuel Delivery	50 ML	2 ML	0.2ML

**Source ERP Addendum Key Project Facts Table, Volume One*

The material, equipment, supplies, buildings and machinery that were not received at Milne Inlet during the 2013 sealift will be carried over to the 2014 sealift and includes the following:

Table 2-8: Facilities and Equipment Remaining at Marshalling Yard after 2013 Sealift

Facility	Quantity
Maintenance building (2521-bld-001)	1
Welding shop (2521-bld-002), (4521-bld)	2
Truck washing building (4523-bld-001)	1
Truckweight foldaway (4382-bld-001)	1
Heavy Equipment and Rolling Stock	**Quantity**
Ore haul pup trailer	5
Ore haul lead trailer	6
Dump box for 740 dump truck	1
Cat 740b dump truck	2
Cat 740b rock truck	1
Cat 824h WH dozer	1
Cat 988h loader	1
Cat 345dl excavator	1

An extensive list of all mechanical equipment to be received during the 2014 is presented in the table below:

Table 2-9: Mechanical Equipment to be Received during 2014

Description	Equipment type	Quantity
Magnetic base drill	Shop / maintenance equipment	2
Hydraulic porta power pump	Shop / maintenance equipment	2
Bench grinder	Shop / maintenance equipment	6
Truck mount goodall boost system	Shop / maintenance equipment	2
Goodall boost system	Shop / maintenance equipment	2
A/c recovery recharge unit	Shop / maintenance equipment	2
Battery charger	Shop / maintenance equipment	4
Tube bender	Shop / maintenance equipment	2
Platform scale	Shop / maintenance equipment	2
Milling machine	Shop / maintenance equipment	1
Tire siping machine	Shop / maintenance equipment	1
Track pin press	Shop / maintenance equipment	2
Inching tool	Shop / maintenance equipment	1
Generator	Generator	4
Single pass production drill	Mobile equipment	1
Tote road ore haul truck - tractor	Mobile equipment	16
Tote road ore haul truck - lead trailer	Mobile equipment	10
Tote road ore haul truck - pup trailer	Mobile equipment	10
Mobile equipment lowboy trailer	Mobile equipment	1
Stockpile, front end loader	Mobile equipment	4
Mid size excavator	Mobile equipment	2
Laboratory Equipment	Laboratory equipment	27
Diesel fuel dispensing module arctic diesel pump	Pump	14
Jet-a1 fuel dispensing module fuelling station	Fire services	2
Jet-a1 fuel dispensing module discharge pump	Pump	2
Fuel oil pump	Pump	6
Jet-a1 tank	Tank	2
Maintenance building diesel tank	Tank	1
Warehouse building diesel tank	Tank	1
Truck wash building diesel tank	Tank	1
Arctic diesel tank	Tank	2
Stockpile generator	Generator	5
Shiploader	Shiploader	2
Reclaim conveyor	Conveying	1
Shiploader link conveyor	Conveying	1

Description	Equipment type	Quantity
Discharge chutes & diverters for reclaim conveyor & shiploader	Chute / diverter	11
Sampler bin	Hopper	1
Ore sampler	Sampler	1
Belt scale	Screen	1

To the extent practicable, all materials and supplies required to execute the 2014 Work Plan and the work scheduled for January to June 2014 has been received during the 2013 sealifts. Additional materials and supplies to support operations through the remainder of 2014 and 2015 will arrive including:

- Delivery of ammonium nitrate (AN), 520,000 kg;
- Delivery of pre-packaged explosives 83,000 kg;
- Delivery of maintenance parts;
- Delivery of consumables (lubricants, grease, detergents, boosters, EZ Dets, dry goods, food, household supplies, etc.).

2.10 CLOSURE AND RECLAMATION COSTS

The Tenant shall provide: *"A description of the applicable provisions of the Closure and Reclamation Plan for the upcoming Year, a report of the estimated costs to be incurred to implement the Closure and Reclamation Plans for the Year and the balance of the Term;"*

The provision of additional securities for the 2014 work is allocated as summarised in Table 2-10 below. Further detail can be found in document H349000-1000-07-126-0017.

Table 2-10: Mary River Project Closure and Reclamation Security Summary, 2014

Liability Allocation		Mary River Exploration Project Closure Cost Estimate **(Type B Renewal)**	2014 Work Plan Marginal Closure Estimate – **Approved Activities (Type A)**	2014 Work Plan Marginal Closure Estimate – **ERP Activities (Type A)**	TOTAL 2014 Marginal Closure Estimate for Mary River Project - **(Type A)**
TOTAL		**$1,247,000**	**$3,315,000**	**$279,000**	**$3,594,000**
IOL	Land	$147,000	$3,150,000	$279,000	$3,428,000
	Water	$18,000	$0	$0	$0
	Total IOL	**$165,000**	**$3,150,000**	**$279,000**	**$3,428,000**
Crown	Land	$1,082,000	$166,000	$0	$166,000
	Water	$0	$0	$0	$0
	Total Crown	**$1,082,000**	**$166,000**	**$0**	**$166,000**

2.11 OPTION EXERCISE NOTICES

The Tenant shall provide: *"All Option Exercise Notices;"*

- None contemplated at this time

2.12 LEASE SCHEDULE UPDATES

The Tenant shall provide: *"Updates to items contained in the Schedules of this Lease (if applicable), including without limitation the Closure and Reclamation Plan, the Contingency and Emergency Response Plan, and the Environmental Management and Monitoring Plans;"*

- No changes from those included within the lease document signed September 6, 2013

2.13 LEASE AMMENDMENT PROVISIONS

The Tenant shall provide: *"Requested amendments to the provisions of this Lease (if applicable);"*

- No changes from those included within the lease document signed September 6, 2013

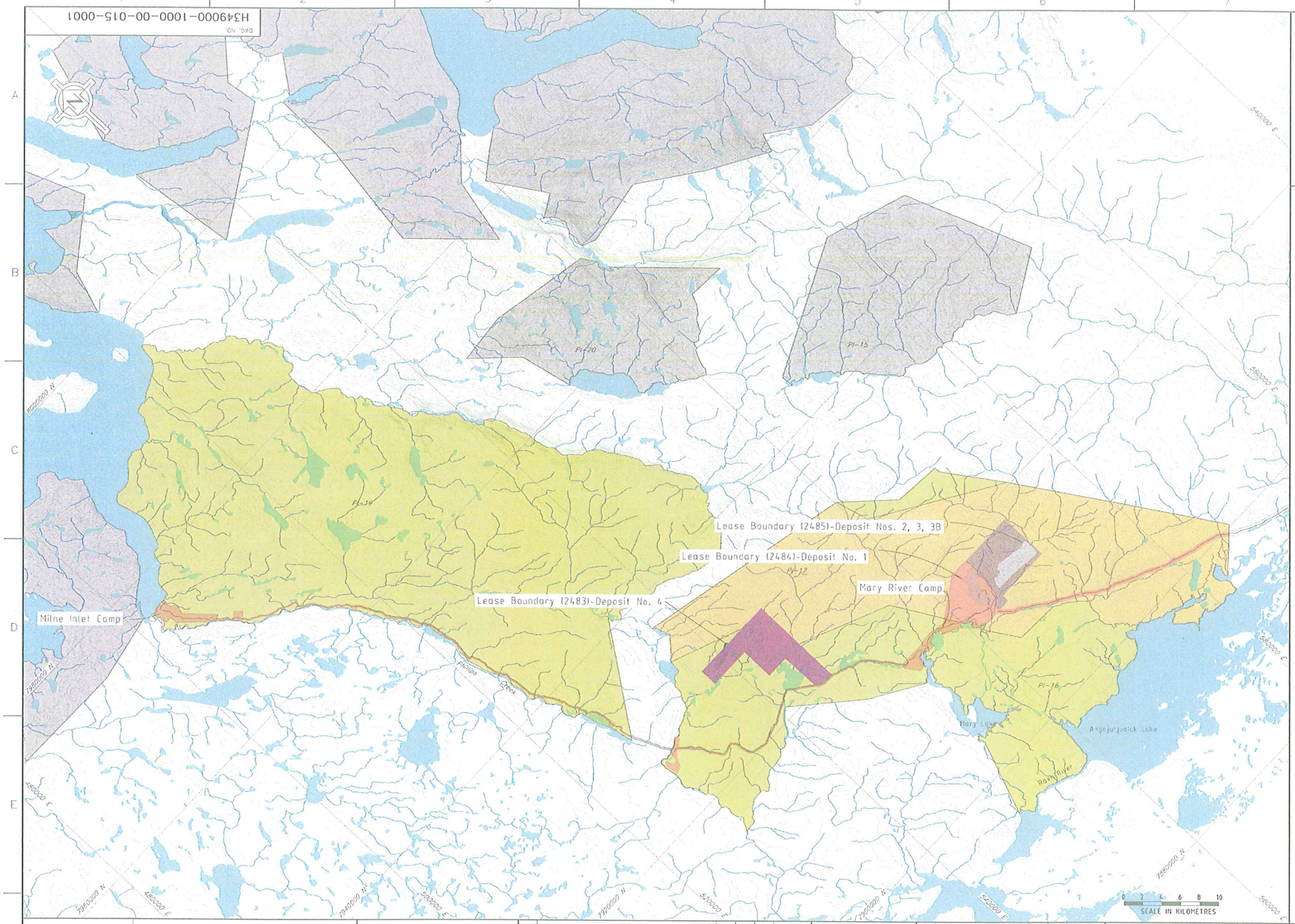
XX:xx
Attachment(s)/Enclosure

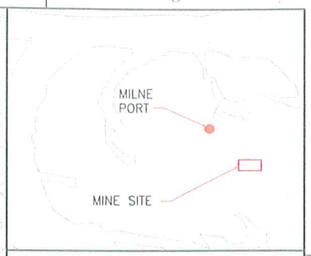
APPENDIX A

Drawings:

- **H349000-1000-00-015-0001;**
- **H349000-1000-00-015-0002;**
- **H349000-1000-00-015-0003; and**
- **H349000-1000-00-015-0004.**

DWG. NO. H349000-1000-00-015-0001





KEYPLAN

LEGEND:

- WATER
- GENERAL INUIT OWNED LAND-SURFACE ONLY EXCLUDING MINERALS
- GENERAL INUIT OWNED LAND-SURFACE AND SUBSURFACE INCLUDING MINERALS
- CROWN LAND
- INUIT OWNED LAND-SURFACE ONLY EXCLUDING MINERALS
- EXISTING TOTE ROAD

DESCRIPTION	AREA (ha)
IMPACT AREA	
MARY RIVER AREA	5184
MILNE AREA	701
TOTE ROAD QUARRIES	413
RAIL	1329
MILNE INLET TOTE ROAD CENTRE LINE PLUS 100m	1555
TOTAL IMPACT AREA	7268
EXPLORATION	
2/3 DEPOSIT	2457
4/5 DEPOSIT	4350
TOTAL EXPLORATION AREA	6807
TOTAL AREA	14075 ha

REGISTERED PROFESSIONAL ENGINEER M.J. BOYKO LICENCE 11015 NT/NU

PERMIT TO PRACTICE HATCH LTD
Signature
Date 17 JULY 13
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	BY	CHK'D	APP'D	DATE

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE
0	PRODUCTION LEASE		2013-07-15

ISSUE AUTHORIZATION

HATCH™

DESIGNED BY M. ANDERSON DATE 2013-05-15	DRAWN BY C. LEISTNER DATE 2013-05-15
CHECKED BY I. THEAKER DATE 2013-07-15	DISC'P. ENGR. J. LEMAY DATE 2013-07-15
PROJ. DES. COORD. T. THEAKER DATE 2013-07-15	PROJ. ENGR. J. CLEGG DATE 2013-07-15
PROJ. MGR. S. PERRY DATE 2013-07-15	

Baffinland

MARY RIVER PROJECT

SCHEDULE A1
THE PROPERTY

SCALE	DWG. NO.	REV.
1:200000 OR AS NOTED	H349000-1000-00-015-0001	0

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

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DWG. NO.

MILNE INLET

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E:504250.00

Q1

N:7975575.00
E:502500.000

Q2

EXISTING LAND LEASE BOUNDARY

N:7975121.788
E:502750

PHILLIPS CREEK

N:7975175.00
E:504850.00

MILNE INLET TOTE ROAD

N:7974750.00
E:502750.00

N:7974750.00
E:503450.00

POTENTIAL DEVELOPMENT AREA

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E:504550.00

N:7974000.00
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Q7

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E:505725.00

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E:506575.00

0 120 240 360 480 600
SCALE IN METRES

MILNE PORT

5

MINE SITE

KEYPLAN

LEGEND:

- WATER
- RIVER/STREAM/DRAINAGE
- POTENTIAL DEVELOPMENT AREA
- EXISTING BAFFINLAND'S COMMERCIAL LEASE ON INUIT OWNED LAND
- IMPACT AREA
- ROAD
- TOTE ROAD
- QUARRY SAMPLE LOCATIONS

REGISTERED PROFESSIONAL ENGINEER
M.C. DOYXX
LICENSEE
17/7/13
NT/NU

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 1.5 METRES.
4. AS-CONSTRUCTED INFORMATION PROVIDED BY GENIVAR IN 2008.

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

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HATCH LTD.
Signature
Date 17 JULY 13
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NT/NU

NO.	DESCRIPTION	BY	CHK'D	APP'D	DATE
REVISIONS					

REV.	ISSUE FOR	AUTH. BY	DATE
0	PRODUCTION LEASE		2013-07-15
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY: M. ANDERSON DATE 2013-05-16	DRAWN BY: C. LEISTNER DATE 2013-04-03
CHECKED BY: T. THEY DATE 2013-07-15	DISCIP. ENGR: J. LEMAY DATE 2013-07-15
PROJ. DIR. / CORP. T. THEY DATE 2013-07-15	PROJ. ENGR. V. CLELAND DATE 2013-07-15
PROJ. MGR. S. PERRY DATE 2013-07-15	

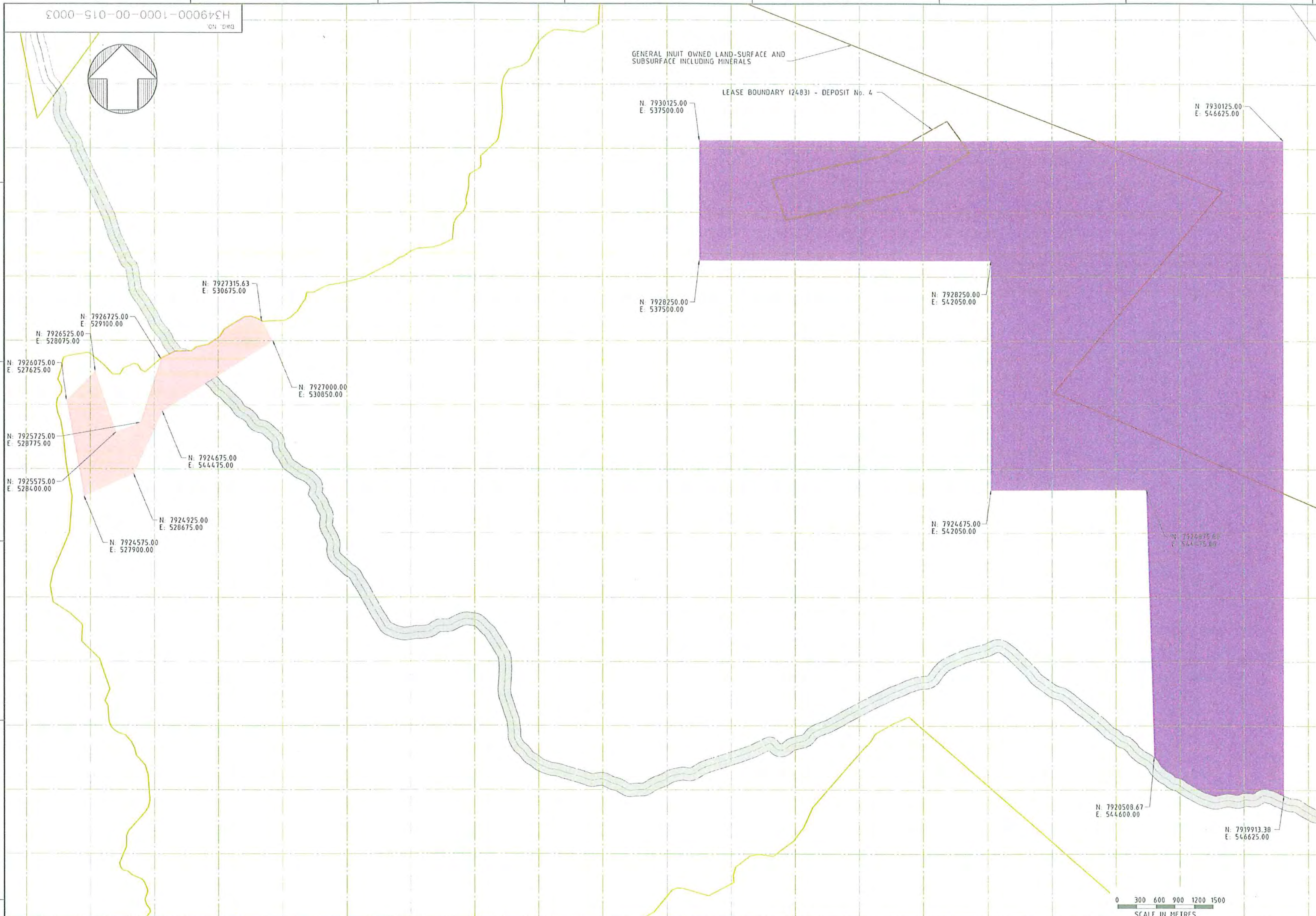
Baffinland

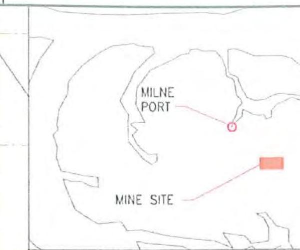
MARY RIVER PROJECT

SCHEDULE A3
MILNE INLET IMPACT AREA

SCALE	DWG. NO.	REV.
AS NOTED OR AS NOTED	H349000-1000-00-015-0002	0

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)





KEYPLAN

LEGEND:

- WATER
- RIVER/STREAM/DRAINAGE
- POTENTIAL DEVELOPMENT AREA
- EXISTING BAFFINLAND'S COMMERCIAL LEASE ON INUIT OWNED LAND
- IMPACT AREA - BORROW SOURCE
- EXPLORATION AREA - DEPOSIT 4/5
- ROAD
- TOTE ROAD

NOTE:

CONTOURS AND WATER INFORMATION NOT AVAILABLE

PERMIT TO PRACTICE
HATCH LTD.
Signature [signature]
Date 17 JULY 13
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
M. J. BUYKX
LICENSEE
17/7/13
NT/NU

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	BY	CHK'D	APP'D	DATE

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE
0	PRODUCTION LEASE		2013-07-15

ISSUE AUTHORIZATION

HATCH™

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CHECKED BY T. THERTELL DATE 2013-07-15	DISCIP. ENGR. J. LEMAY DATE 2013-07-15
PROJ. DES. COORD. T. THERTELL DATE 2013-07-15	PROJ. ENGR. J. CLELAND DATE 2013-07-15
PROJ. MGR. S. PERRY DATE 2013-07-15	

Baffinland

MARY RIVER PROJECT

SCHEDULE A4
DEPOSITS 4/5 EXPLORATION AREA

SCALE	DWG. NO.	REV.
1:30000 OR AS NOTED	H349000-1000-00-015-0003	0

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

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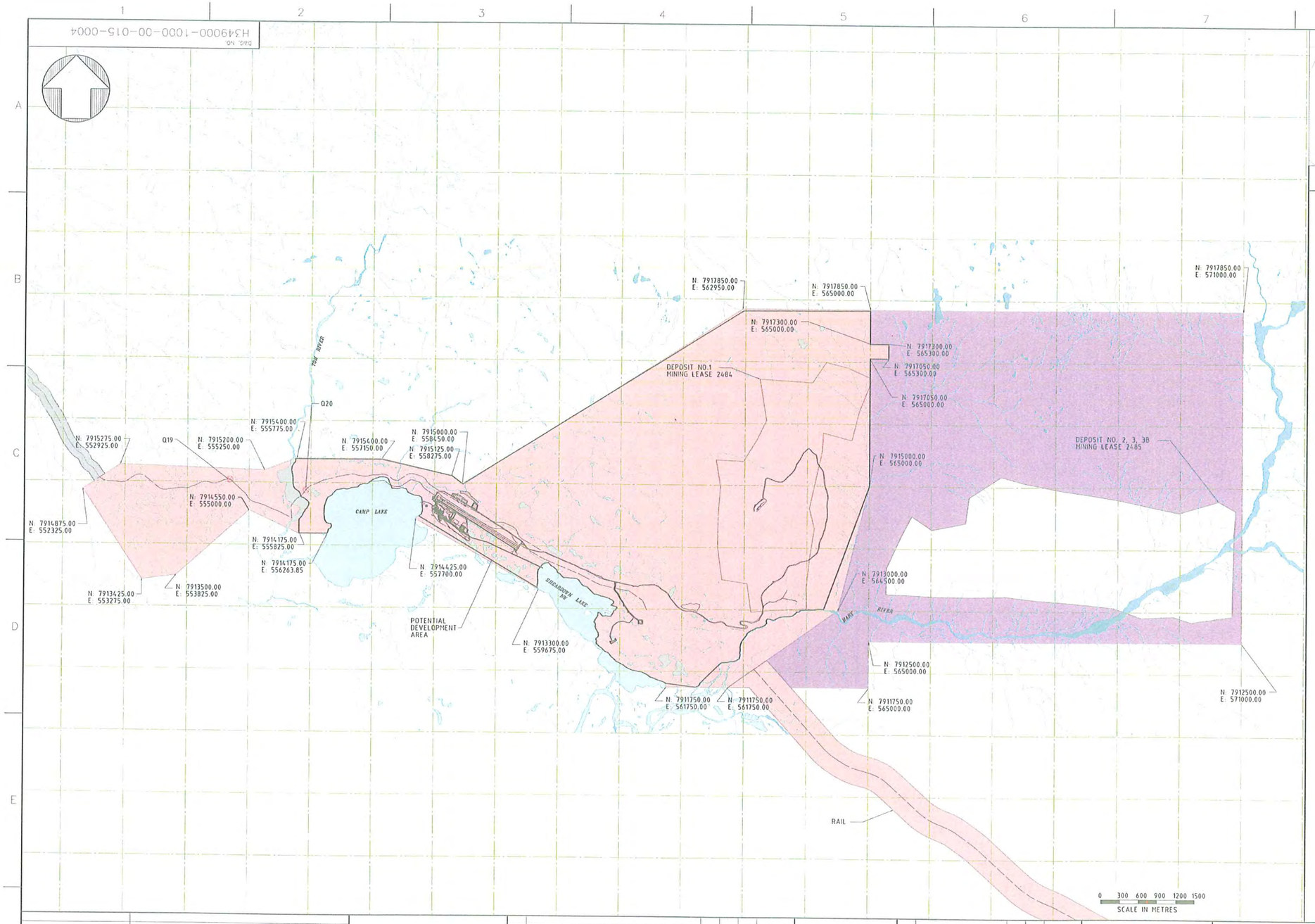

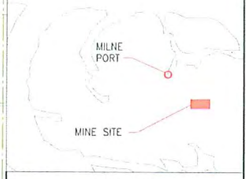

KEYPLAN

LEGEND:

- WATER
- RIVER/STREAM/DRAINAGE
- POTENTIAL DEVELOPMENT AREA
- EXISTING MINING LEASE ON INUIT OWNED LAND
- IMPACT AREA
- EXPLORATION AREA
- ROAD
- TOTE ROAD
- QUARRY SAMPLE LOCATIONS

NUNAVUT PROFESSIONAL ENGINEERS
M. J. LOVICK
LICENSEE
17/7/13
NT/NU

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

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PERMIT NUMBER: P 512
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REVISIONS

NO.	DESCRIPTION	BY	CHK'D	APP'D	DATE

ISSUE AUTHORIZATION

REV.	ISSUE FOR	AUTH. BY	DATE
0	PRODUCTION LEASE		2013-07-15

HATCH™

DESIGNED BY M. ANDERSON DATE 2013-05-15	DRAWN BY C. LEISTNER DATE 2013-05-15
CHECKED T. THERIAULT DATE 2013-07-15	DISCIP. ENGR. J. LEMAY DATE 2013-07-15
PROJ. DES. MGR. T. THERIAULT DATE 2013-07-15	PROJ. ENGR. J. C. LEMAY DATE 2013-07-15
PROJ. MGR. S. PERRY DATE 2013-07-15	

Baffinland

MARY RIVER PROJECT

SCHEDULE A2
MARY RIVER IMPACT & EXPLORATION AREA

SCALE	DWG. NO.	REV.
1:30000 OR AS NOTED	H349000-1000-00-015-0004	0

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

APPENDIX B

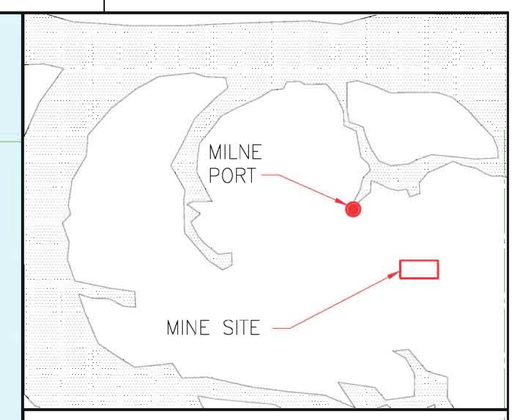
Drawings:

- **Milne Port Site Layout**
- **Mine Site Layout**

H349000-2000-00-015-0002

MILNE INLET

PHILLIPS CREEK



KEYPLAN

ORE DOCK (WHEN ERP APPROVED)

EFFLUENT DISCHARGE TO RECEIVING ENVIRONMENT N 7976482 E 503211

FUTURE SETTLING POND (WHEN ERP APPROVED)

FUEL TANK FARM

NEW EFFLUENT DISCHARGE LOCATION N 7976341 E 503639

SEALIFT BARGE LANDING AREA

RAMP TO BEACH

HAZARDOUS WASTE BERM

LAYDOWN AREA

EXISTING HTO CABIN

LAYDOWN AREA

LAYDOWN EARTHWORKS CONTRACTOR YARD

ORE STOCK PILE (WHEN ERP APPROVED)

POLISHING WASTE STABILIZATION POND

SERVICES AREA PAD SITE FACILITIES, INCLUDING:

- MAINTENANCE/WAREHOUSE BUILDING
- OILY WATER TREATMENT PLANT
- WELDING SHOP BUILDING
- WORKSHOP OFFICE BUILDING

POWER GENERATORS

INCINERATOR

POLISHING WASTE STABILIZATION POND

HAZARDOUS WASTE BERM

FUTURE PROPOSED AIR STRIP

LINED STORAGE AREA

MATRIX CAMP

CAMP INFRASTRUCTURE PAD SITE FACILITIES, INCLUDING:

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

AIRSTRIP

EXISTING TRAILER CAMP

OLD SEWAGE TREATMENT PLANT

LAND FARM

PROJECT DEVELOPMENT AREA

ROCK QUARRY NO.1 BOUNDARY

POTABLE WATER SUPPLY

CONCRETE BATCH PLANT, CRUSHER AND STOCKPILE

TOTE ROAD

EXTENT OF QUARRY Q1

PERMITTED OPEN BURN PIT AREA

BORROW PITS

BORROW SOURCE NO.1

BORROW PITS

0 50 100 150 200 250

SCALE IN METRES

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 1.5 METRES.
4. AS-CONSTRUCTED INFORMATION PROVIDED BY GENIVAR IN 2008.

LEGEND:

- WATER
- PROPOSED QUARRY
- LAYDOWN AREA (CONSTRUCTION PHASE)
- EARLY REVENUE PHASE(ERP) WORK SUBJECT TO REGULATORY APPROVAL
- EXISTING BORROW AREA (IOL COMMERCIAL LEASE)
- EXISTING ROCK QUARRY (IOL COMMERCIAL LEASE)
- RIVER/STREAM/DRAINAGE
- PROJECT DEVELOPMENT AREA
- BAFFINLAND'S COMMERCIAL LEASE ON INUIT OWNED LAND
- ROAD

Baffinland Iron Mines Corporation

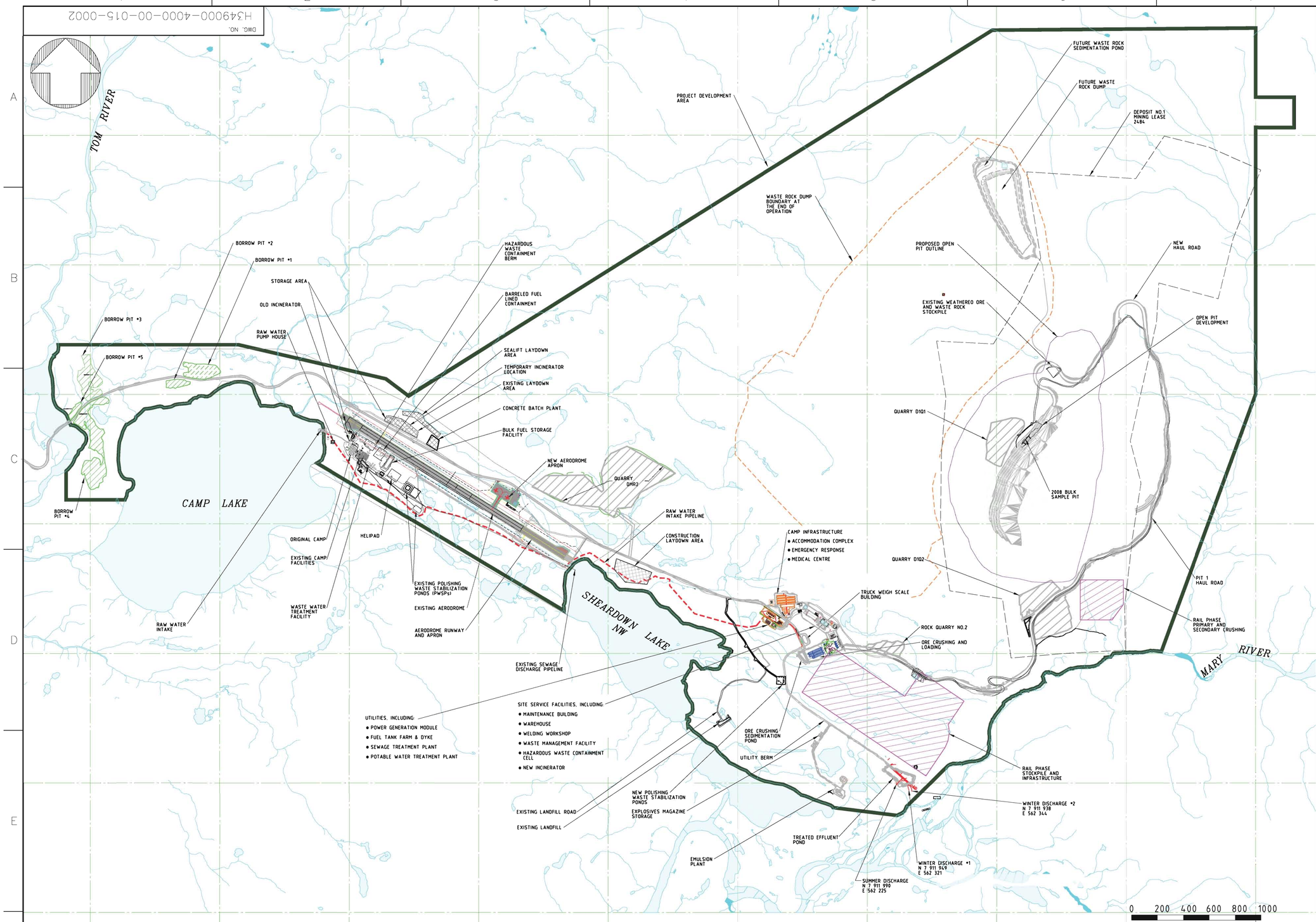
MARY RIVER PROJECT

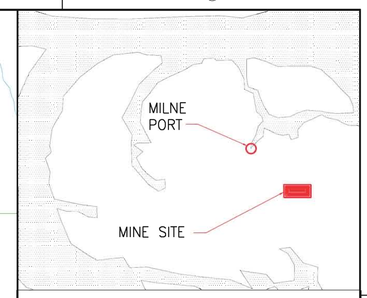
MILNE PORT

SITE LAYOUT

SCALE	DWG. NO.	REV.
1:5000 OR AS NOTED	H349000-2000-00-015-0002	B

DWG. NO. H349000-4000-00-015-0002





KEYPLAN

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 1.5 METRES.
4. AS-CONSTRUCTED INFORMATION PROVIDED BY GENIVAR IN 2008.

LEGEND:

- WATER
- QUARRY
- LAYDOWN AREA (CONSTRUCTION PHASE)
- EXISTING BORROW AREA (IOL COMMERCIAL LEASE)
- EXISTING ROCK QUARRY (IOL COMMERCIAL LEASE)
- ROAD
- RIVER/STREAM/DRAINAGE
- PROJECT DEVELOPMENT AREA
- BAFFINLAND'S COMMERCIAL LEASE ON INUIT OWNED LAND
- RAW WATER INTAKE PIPELINE

Baffinland Iron Mines Corporation

MARY RIVER PROJECT

MINE SITE

SITE LAYOUT

SCALE	DWG. NO.	REV.
1:15000 OR AS NOTED	H349000-4000-00-015-0002	B

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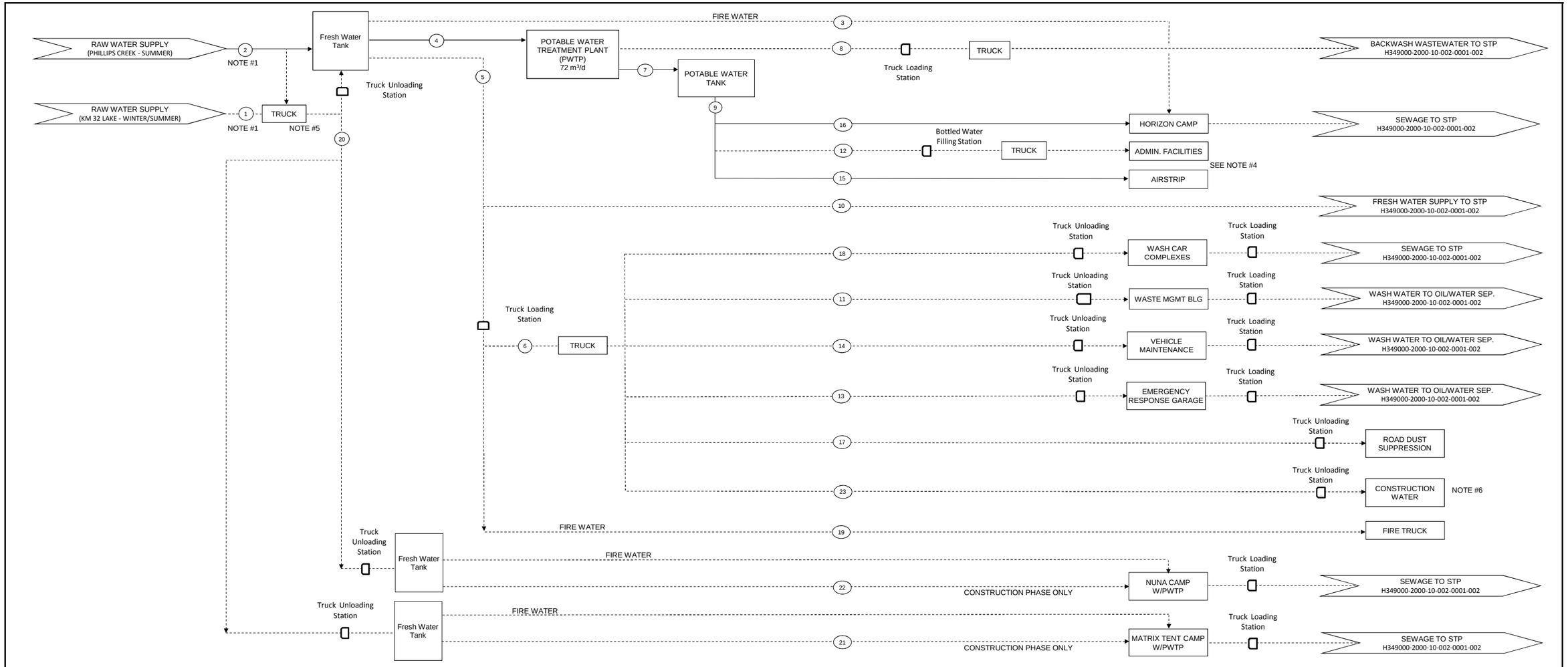
Appendix C -
Block Flow Diagrams – Milne Port and Mine Site



NOTE #1 NOTE #1

Stream No.	1	2	3	4	5	6	7	8	9	10	11	12
Stream Description	WINTER RAW WATER SUPPLY	SUMMER RAW WATER SUPPLY	FIREWATER	FEED TO POTABLE TREATMENT SYSTEM	PIPED FRESH WATER	TRUCKED FRESH WATER	POTABLE SYSTEM PRODUCT FLOW	POTABLE SYSTEM WASTE FLOW	PIPED POTABLE WATER	FRESH WATER TO STP	WASH WATER TO WASTE MGMT BLG	BOTTLED WATER TO ADMIN. BUILDING
Construction Phase - Design (m^3/h)	2.85	2.85	300	3.00	43.86	42.86	3.00	0.00008	11.78	1.000	1.000	0.200
Construction Phase - Nominal (m^3/h)	2.85	2.85	-	1.52	0.65	0.59	1.52	0.00008	1.52	0.060	0.043	0.008
Operation Phase - Design (m3/h)	2.85	2.85	300	3.00	43.86	42.86	3.00	0.00008	11.78	1.000	1.000	0.200
Operation Phase - Nominal (m3/h)	1.91	1.91	-	1.52	0.39	0.33	1.52	0.00008	1.52	0.060	0.043	0.008
Stream No.	13	14	15	16	17	18	19	20	21	22	23	24
Stream Description	WASH WATER FOR EMERG. RESPONSE SHOP	WASH WATER FOR VEHICLE MAINT. SHOP	POTABLE WATER TO AIRSTRIP	POTABLE WATER TO HORIZON CAMP	FRESH WATER FOR DUST SUPPRESS	WASH CARS COMPLEXES	FIRETRUCK	FEED TO MATRIX TENT & NUNA CAMPS	FRESH WATER TO MATIX TENT CAMP	FRESH WATER TO NUNA/ SHENKO CAMP	CONSTR. WATER	NOT USED
Construction Phase - Design (m^3/h)	1.000	42.86	0.480	11.10	42.86	42.9	42.86	5.09	2.78	2.31	0.92	
Construction Phase - Nominal (m^3/h)	0.043	0.25	0.013	1.50	0.21	0.04	0.00	0.69	0.38	0.31	0.01	
Operation Phase - Design (m3/h)	1.000	42.86	0.480	11.10	42.86	42.9	42.86	5.09	2.78	2.31	0.00	
Operation Phase - Nominal (m3/h)	0.043	0.00	0.013	1.50	0.21	0.0	0.00	0.00	0.00	0.00	0.00	

NOTE(S):

1.0 Raw water supply flow rate from Philips Creek (Summer) & KM 32 Lake (Winter/Summer) are equal to or less than Type A Water Licence 2AM-MRY1325 flow rate limit of 68.5 m^3/day (25,000 m^3/year) total.
2.0 Construction phase potable water supply flow rate is 52.5 m^3/day total.
3.0 Operational phase potable water supply flow rate is 36.0 m^3/d total.
4.0 Sewage generated by the Admin. Facilities and the Airstrip reports to the Wash Car Complexes, which provide washroom facilities for these users.
5.0 Option of trucking additional fresh water from Mine Site, if required.
6.0 Option of reusing treated sewage effluent for additional construction water requirements, if required.

LEGEND:

CONTINUOUS FLOW ————

INTERMITTENT FLOW - - - - - - -

REV				
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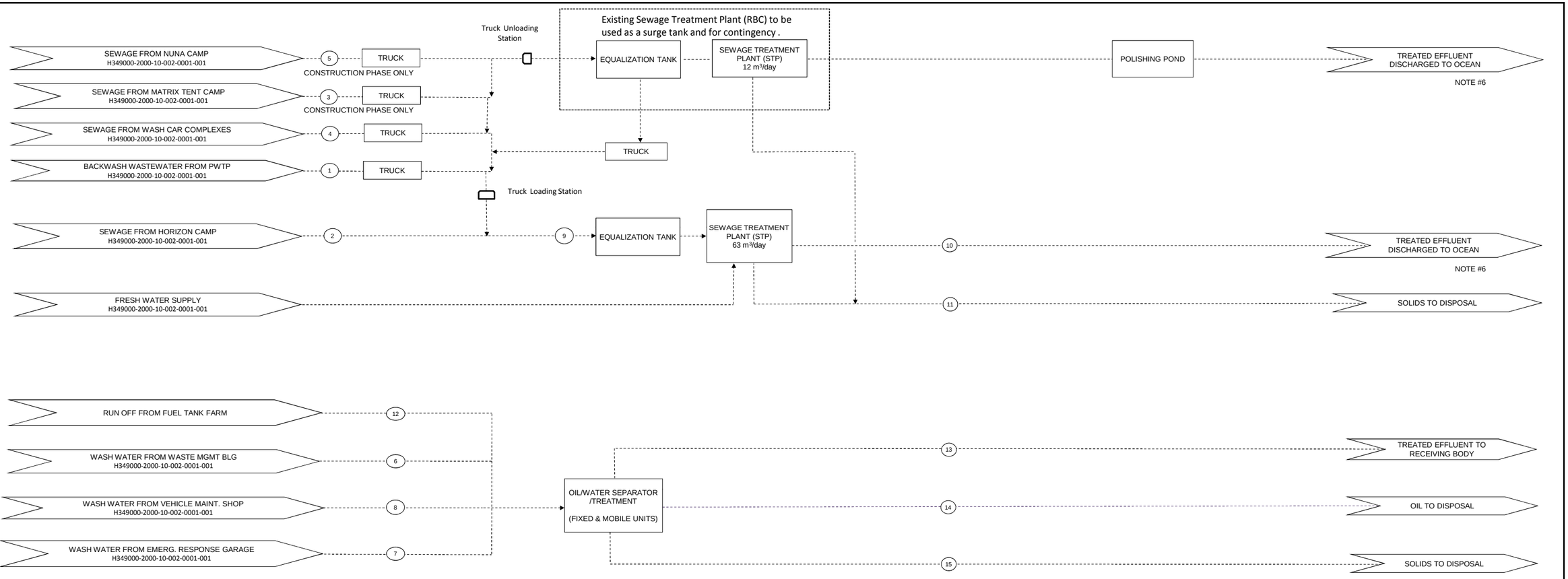
MARY RIVER PROJECT

MILNE INLET
WATER SUPPLY BALANCE
BLOCK FLOW DIAGRAM
2014
(cont'd from DWG# H337697-7000-10-002-0001)

SCALE **NTS** OR AS NOTED

DWG NO. H349000-2000-10-002-0001-001

REV. A



Stream No.	1	2	3	4	5	6	7	8	9	10	11	12
Stream Description	BACKWASH WASTE FROM PWTP	SEWAGE FROM HORIZON CAMP	SEWAGE FROM MATRIX TENT CAMP	SEWAGE FROM WASH CAR COMPLEXES	SEWAGE FROM NUNA CAMP	WASH WATER FROM WASTE MGMT BLG	EMER. RESPONSE GARAGE	WASH WATER FROM VEHICLE MAINT. SHOP	FEED TO EQ TANK/STP	STP EFFLUENT	STP SOLIDS TO DISPOSAL	RUN OFF WATER FROM TANK FARM
Construction Phase - Design (m^3/h)	0.00008	11.10	2.78	42.9	2.31	1.00	1.00	42.86	16.19	2.17	0.017	202.0
Construction Phase - Nominal (m^3/h)	0.00008	1.50	0.38	0.04	0.31	0.04	0.04	0.25	2.19	2.17	0.017	1.4
Operation Phase - Design (m^3/h)	0.00008	11.10	2.78	42.9	2.31	1.00	1.00	42.86	16.19	2.17	0.012	202.0
Operation Phase - Nominal (m^3/h)	0.00008	1.50	0.00	0.04	0.00	0.04	0.04	0.00	1.50	1.49	0.012	1.4
Stream No.	13	14	15	16	17	18	19	20	21	22	23	24
Stream Description	OIL/ WATER SEP. EFFLUENT	OIL/ WATER SEP. OIL WASTE	OIL/ WATER SEP. SOLIDS WASTE	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
Construction Phase - Design (m^3/h)	1.69	0.003	0.358									
Construction Phase - Nominal (m^3/h)	1.69	0.003	0.358									
Operation Phase - Design (m3/h)	1.69	0.002	0.358									
Operation Phase - Nominal (m3/h)	1.22	0.002	0.260									

NOTE(S): See drawing # H349000-2000-10-002-0001-001 for notes.

LEGEND:

CONTINUOUS FLOW ————

INTERMITTENT FLOW - - - - - - - - - -

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MARY RIVER PROJECT

MILNE INLET
WASTE BALANCE
BLOCK FLOW DIAGRAM
2014
(cont'd from DWG# H337697-7000-10-002-0001)

SCALE	DWG NO.	REV.
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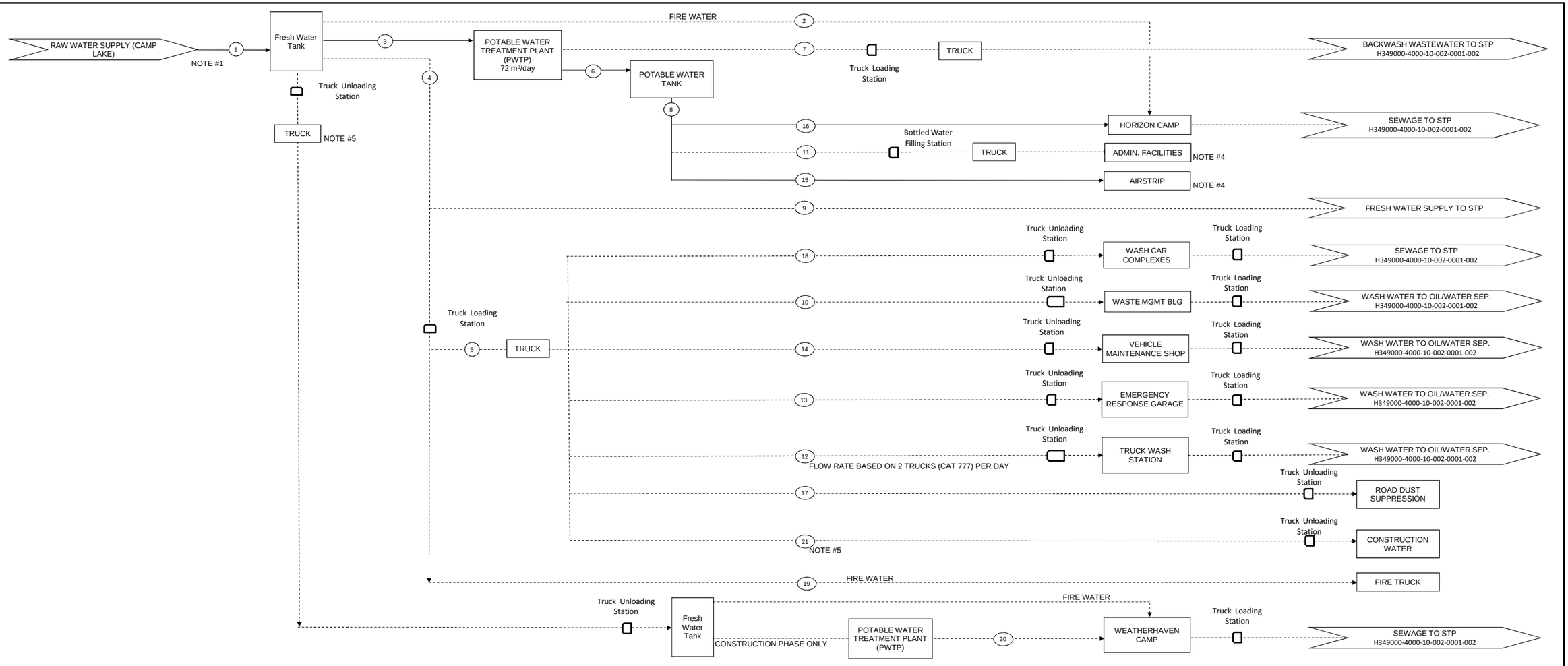

NOTE #1

Stream No.	1	2	3	4	5	6	7	8	9	10	11	12
Stream Description	RAW WATER SUPPLY	FIREWATER	FEED TO POTABLE TREATMENT SYSTEM	PIPED FRESH WATER	TRUCKED FRESH WATER	POTABLE SYSTEM PRODUCT FLOW	POTABLE SYSTEM WASTE FLOW	PIPED POTABLE WATER	FRESH WATER TO STP	WASH WATER TO WASTE MGMT BLG	BOTTLED WATER TO ADMIN. BUILDING	WASH WATER TO TRUCK WASH STATION
Construction Phase - Design (m^3/h)	27.40	300	3.00	43.86	42.86	3.00	0.00013	19.91	1.000	1.000	0.008	9.583
Construction Phase - Nominal (m^3/h)	10.98	-	2.65	8.33	8.27	2.65	0.00013	2.65	0.060	0.043	0.008	7.667
Operation Phase - Design (m3/h)	27.40	300	3.00	43.86	42.86	3.00	0.00013	19.91	1.000	1.000	0.008	9.583
Operation Phase - Nominal (m3/h)	10.70	-	2.65	8.06	8.00	2.65	0.00013	2.65	0.060	0.043	0.008	7.667
Stream No.	13	14	15	16	17	18	19	20	21	22	23	24
Stream Description	WASH WATER FOR EMERG. RESPONSE SHOP	WASH WATER FOR VEHICLE MAINT. SHOP	POTABLE WATER TO AIRSTRIP	POTABLE WATER TO HORIZON CAMP	FRESH WATER FOR DUST SUPPRESS	WASH CARS COMPLEXES	FIRETRUCK	POTABLE WATER TO WEATHERHAVEN CAMP	CONSTR. WATER	NOT USED	NOT USED	NOT USED
Construction Phase - Design (m^3/h)	1.000	42.86	0.480	19.43	42.86	42.9	42.86	2.78	0.92			
Construction Phase - Nominal (m^3/h)	0.043	0.25	0.013	2.63	0.21	0.04	0.04	0.38	0.03			
Operation Phase - Design (m3/h)	1.000	42.86	0.480	19.43	42.86	42.9	42.86	2.78	0.00			
Operation Phase - Nominal (m3/h)	0.043	0.00	0.013	2.63	0.21	0.0	0.00	0.00	0.00			

NOTE(S):

1.0 Raw water supply flow rate from Camp Lake are equal to or less than Type A Water Licence 2AM-MRY1325 flow rate limit of 657.5 m3/day (240,000 m3/year) total.
2.0 Construction phase potable water supply flow rate is 72.0 m^3/day total.
3.0 Operational phase potable water supply flow rate is 63.0 m^3/day total.
4.0 Sewage generated by the Admin Facilities and the Airstrip reports to the Wash Car Complexes, which provide washroom facilities for these users.
5.0 Option of trucking extra fresh water to Milne Site, if required.

LEGEND:

CONTINUOUS FLOW ————

INTERMITTENT FLOW ----------

REV				
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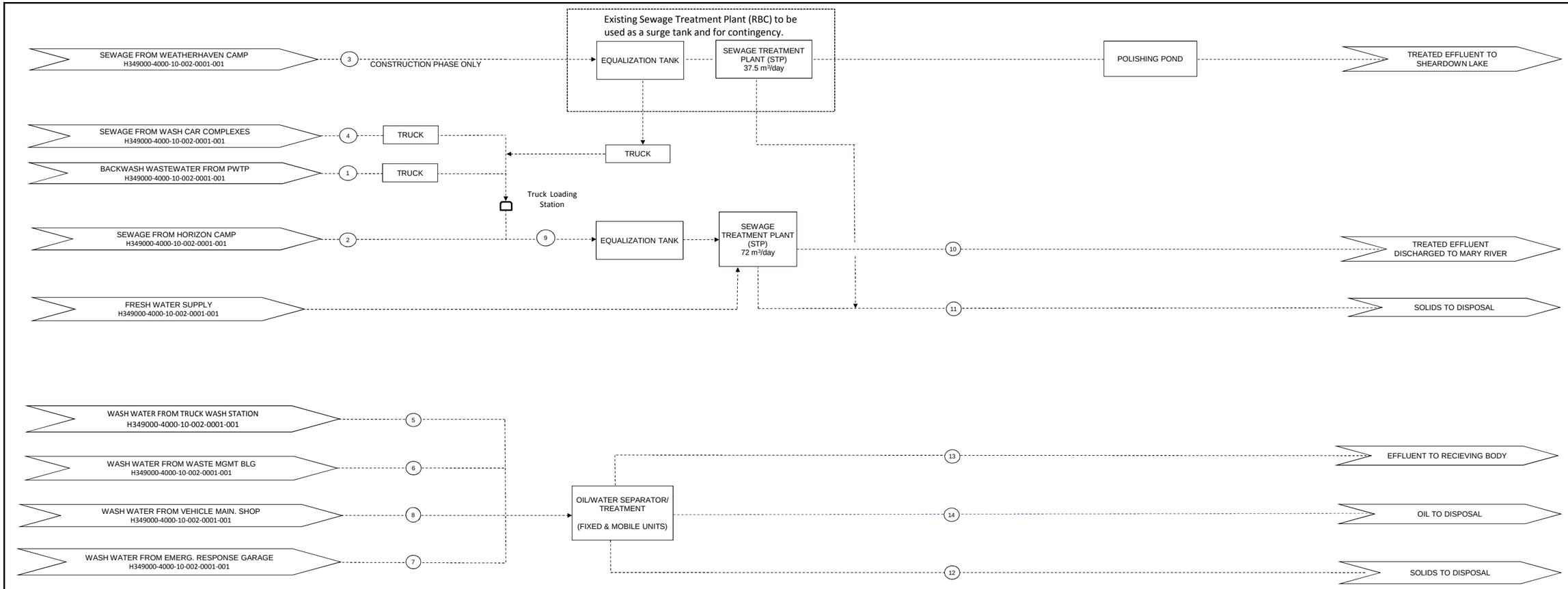
MARY RIVER PROJECT

MINE SITE
WATER SUPPLY BALANCE
BLOCK FLOW DIAGRAM
2014
(cont'd from DWG# H337697-4210-10-002-0001)

SCALE **NTS** OR AS NOTED

DWG NO. H349000-4000-10-002-0001-001

REV. A



Stream No.	1	2	3	4	5	6	7	8	9	10	11	12
Stream Description	BACKWASH WASTE FROM PWTP	SEWAGE FROM HORIZON CAMP	SEWAGE FROM WEATHERHAVEN CAMP	SEWAGE FROM WASH CAR COMPLEXES	WASH WATER FROM TRUCK WASH STATION	WASH WATER FROM WASTE MGMT BLG	EMER. RESPONSE GARAGE	WASH WATER FROM VEHICLE MAINT. SHOP	FEED TO EQ TANK/STP	STP EFFLUENT	STP SOLIDS TO DISPOSAL	OIL/ WATER SEP. SOLIDS WASTE
Construction Phase - Design (m^3/h)	0.00013	19.4	2.78	42.9	9.58	1.00	1.00	42.86	22.20	2.98	0.02	2.74
Construction Phase - Nominal (m^3/h)	0.00013	2.63	0.38	0.04	7.67	0.04	0.04	0.25	3.00	2.98	0.02	2.74
Operation Phase - Design (m^3/h)	0.00013	19.4	2.78	42.9	9.58	1.00	1.00	42.86	22.20	2.98	0.02	2.74
Operation Phase - Nominal (m^3/h)	0.00013	2.63	0.00	0.04	7.67	0.04	0.04	0.00	2.63	2.60	0.02	2.70
Stream No.	13	14	15	16	17	18	19	20	21	22	23	24
Stream Description	OIL/ WATER SEP. EFFLUENT	OIL/ WATER SEP. OIL WASTE	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
Construction Phase - Design (m^3/h)	12.90	0.025										
Construction Phase - Nominal (m^3/h)	12.90	0.025										
Operation Phase - Design (m3/h)	12.90	0.024										
Operation Phase - Nominal (m3/h)	12.70	0.024										

NOTE(S): See drawing # H349000-4000-10-002-0001-001 for notes.

LEGEND:

CONTINUOUS FLOW ————

INTERMITTENT FLOW - - - - - -

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MARY RIVER PROJECT

MINE SITE
WASTE BALANCE
BLOCK FLOW DIAGRAM
2014
(cont'd from DWG# H337697-4210-10-002-0001)

SCALE **NTS** OR AS NOTED

DWG NO. H349000-4000-10-002-0001-002

REV. A