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BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT

BULK SAMPLING PROGRAM
LANDFILL DESIGN AND OPERATIONS
(REF. NO. NB102-00181/10-6)

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EXECUTIVE SUMMARY

Baffinland Iron Mines Corporation (Baffinland) is undertaking a Bulk Sampling Program in combination with ongoing exploration, geotechnical drilling, and environmental baseline studies. A permanent landfill site is required to support the needs of these programs.

Based on discussions with the Nunavut Water Board (NWB), the Bulk Sample Landfill Site is considered to be a modified landfill. The landfill has been designed in accordance with the "Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories". The Guidelines state that all new landfills should be planned based on a 40 year planning horizon. However, due to the short-term nature of the Bulk Sampling Program, the landfill has been planned based on 2 years of operations plus 1 year of closure activities. The estimated waste volume for the proposed landfill is 5,000 m^3. Additional capacity could however be available at this site. Toxic or hazardous wastes will be disposed of off site at an approved facility.

An options review was completed to determine the optimum location for the landfill site based on the requirements of the Guidelines. The preferred location is southeast of the upper basin of Sheardown Lake. Due to the granular nature of the existing foundation soils and the presence of permafrost, it was determined that the slope stability of the perimeter berms and bearing capacity of the foundation soils would be adequate for the landfill.

The area method will be used for waste disposal wherein a low height berm will be constructed along two sides of the landfill site and then waste will be disposed of against the berms and directly onto the ground downstream of the berms. Sand and gravel will be used as the cover material. In order to achieve permafrost encapsulation in the landfill site, the final cover will be thicker than the active layer. Appropriate surface water, erosion and sediment control measures will be implemented during operations. No fencing will be required as the inert waste should not attract wildlife, and public access to the area is restricted.

An operations and maintenance manual forms part of this document in accordance with the requirements of the NWB. This includes an internal monitoring and reporting program. This monitoring program will be conducted in conjunction with other programs currently in place for the project. The landfill is not expected to significantly change the quality of surface waters in the area due to the inert nature of the waste and small landfill footprint. Because of permafrost in the area, no groundwater protection system has been included. In addition, landfill gas is not expected to be an issue as the deposited waste will be non-hazardous and inert. Therefore a landfill gas collection system will not be installed in the landfill site.

Annual reporting will be included in the annual water license report. This will include information such as: volume of waste deposited, landfill site development, monitoring results, remaining life expectancy, and select photographs.

Final closure of the landfill site will be conducted in a manner which ensures long-term protection of the environment. In addition, the NWB will be notified at least 6 months in advance of the landfill site closure and provided a post-closure inspection checklist including inspection frequency, list and description of items to be inspected and compliance requirements. Once the final cover is in good shape and post-closure monitoring shows the landfill is physically stable, Baffinland will submit a report to the NWB requesting cessation of the post-closure inspections.

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Baffinland Iron Mines Corporation ᐱᕙᓪᓕᐊᓂᖓ ᑲᔪᓯᕙᓪᓕᐊᓂᖓᓄᑦ ᐱᒋᐊᕈᒪᒃᒪᑕ ᖃᐅᔨᓴᒃᓴᓂᒃ ᐅᔭᖁᒃᓂᐊᕐᓗᑎᒃ. ᐃᓚᒋᓗᓂᐅᒃ ᕿᓂᕐᐸᓪᓕᐊᓂᖏᓐᓄᑦ, ᐅᔭᖁᓂᒃ ᖃᐅᔨᓴᕐᓂᖏᓐᓄᑦ ᓂᐅᕐᖃᑦᑕᕐᑐᑦ ᐊᒻᒪᓗ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ. ᐊᒃᑕᕐᕕᐅᖏᓐᓇᕐᓂᐊᕐᑐᒥᒃ ᐱᔭᓇᐊᖃᓚᒃᒪᑕ. .

ᐅᖃᓪᓚᒃᕕᒋᑲᑕᒃᖢᑎᒍ ᓄᓇᕗᑦᒥ ᐃᒥᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦ ᖃᐅᔨᓴᕐᑎᓪᓗᒋᑦ ᐊᒃᑕᕐᕕᐅᔪᖅ ᓄᑕᖑᓇᐊᖅᑲᕐᓂᕿᕐᑕᐅᒃᒪᑦ. ᐊᒃᑕᕐᕕᒃ ᐊᕿᒃᓯᒪᔪᖅ ᒪᓕᒃᖢᒋᑦ ᒪᓕᒐᐅᔪᑦ ᐊᕿᒃᓯᒪᔪᑦ "ᐸᕐᓇᕐᑕᐅᓂᖏᓐᓄᑦ, ᐊᕿᒃᓯᒪᓂᖓᓄᑦ,ᐊᐅᓚᑕᐅᓂᖓᓄᑦ, ᐊᒻᒪᓗ ᑲᒪᒋᔭᐅᓂᖓᓄᑦ ᐊᕿᒋᐊᕐᓯᒪᔪᑦ ᐊᒃᑕᕐᕕᑦ ᓄᓇᑦᓯᐊᕐᒥ". ᒪᓕᒐᐅᔪᑦ ᐅᖃᕐᓯᒪᒃᒪᑕ ᓄᑕᖑᔪᑦ ᐊᒃᑕᕐᕕᑦ ᐸᕐᓇᒃᑕᐅᔭᕆᐊᖃᕐᓂᖏᓐᓂᒃ ᐃᓱᒪᒋᓗᒍ ᐊᕐᒍᓄᑦ 40-ᓄᑦ ᐊᑐᕐᑕᐅᓚᔭᕐᓂᖓᓂᒃ. ᑭᓯᐊᓂ, ᕿᓚᒻᒥᐅᔪᒃᑯᑦ ᐊᑐᕐᑕᐅᓚᔭᕐᓂᖓᓄᑦ ᖃᐅᔨᓴᒃᓴᓂᒃ ᐅᔭᖁᒃᓂᐊᕐᑎᓪᓗᒋᑦ, ᐊᒃᑕᕐᕕᐅᓂᐊᕐᑐᖅ ᐊᕿᒃᑕᐅᓯᒪᔪᖅ ᐃᓱᒪᒋᔭᐅᓪᓗᓂ ᐊᕐᒍᓄᑦ ᒪᕈᒃᓄᑦ (2) ᐊᑐᕈᓐᓇᕐᖢᓂ ᐊᐅᓚᑎᓪᓗᒍ ᐃᓚᓪᓗᓂᓗ ᐊᑕᐅᓯᕐᒥᒃ ᐊᕐᒍᒥᒃ ᒪᑐᐹᓪᓕᐊᑎᓪᓗᒍ. ᐃᓱᒪᒋᔭᐅᔪᖅ ᐃᓗᓪᓕᕐᑕᐅᔪᓐᓇᕐᓴᕐᒪᖓᑦ ᐊᖏᓂᖃᕐᑐᒥᒃ 5,000 ᑭᑉᐸᓇᒃᓯᓗᒍ ᒥᑕ. ᐊᖏᒃᓕᒋᐊᒃᑲᓐᓂᓇᐊᖅᑲᕈᓂ ᐊᖏᒃᓕᒋᐊᕐᑕᐅᔪᓐᓇᕐᑐᖅ. ᐸᑦᑕᕐᓇᕐᑐᑦ ᐃᒋᐊᑕᐅᔪᑦ ᐊᓯᐊᓄᐊᕐᑕᐅᖃᑦᑕᕐᓂᐊᕐᑐᑦ ᐊᖏᕐᑕᐅᓯᒪᔪᒧᑦ ᐃᒋᑦᑎᕕᐅᔪᒧᑦ.

ᖃᓄᕐᑐᕈᑎᒃᓴᓂᕐ ᕿᒥᕈᓚᐅᕐᑐᑦ ᖃᐅᔨᓇᓱᒃᖢᑎᒃ ᐱᐅᓚᖑᔪᒥᒃ ᐃᓂᒋᔭᐅᔪᓐᓇᕐᑐᒥᒃ ᐊᒃᑕᕐᕕᐅᔪᓐᓇᕐᑐᒥᒃ ᒪᓕᒐᐃᑦ ᒪᓕᒃᖢᒋᑦ ᐱᔭᓇᐊᖃᕐᓂᖏᑦ. ᐊᒃᑕᕐᕕᐅᔪᒥᓇᓚᖑᔪᖅ ᑲᓇᒃᓇᖓᓂ ᐊᑭᓐᓇᕐᐸᓯᐊᓂ ᑕᓯᐅᑦ ᐊᑎᖃᕐᑐᖅ Sheardown Lake. ᑐᐊᐸᖓ ᑕᒃᑯᓪᓗᒍ ᐊᒻᒪᓗ ᖁᐊᖑᓂᖓ ᐃᓱᒪᒋᓪᓗᒍ ᐊᑕᓂᑦᑐᖅ, ᐊᕿᒃᑕᐅᓚᐅᕐᑐᖅ ᓯᕕᖓᔭᕐᑐᒥᓪᓗᓂ ᐊᕙᓗᓯᒪᓗᓂ ᖃᑦᑎᒃᓯᓕᕐᓯᒪᔪᒥᒃ ᑐᐊᐸᒃᒥᒃ.

ᐊᕿᒃᑕᐅᓂᐊᕐᑐᖅ ᐊᒃᑕᕐᕕᐅᓂᐊᕐᑐᖅ ᐳᒃᑭᑦᑐᒥᒃ ᑐᐊᐸᒃᒥᒃ ᖃᑦᑎᒃᓯᓕᕐᓗᒍ ᐊᕙᑕ ᐊᒻᒪᓗ ᐊᒃᑕᕐᑕᐅᔪᑦ ᑭᒃᓕᖓᓄᑦ ᖃᑦᑎᒃᓯᓕᕐᓯᒪᔪᑦ ᓇᐅᕕᑕᐅᖃᑦᑕᕐᓗᑎᒃ ᒪᓂᕋᕐᒧᑦ ᐊᑎᖓᖓᓄᑦ ᖃᑦᑎᒃᓯᓕᕐᓯᒪᔪᑦ. ᓯᐅᕋᕐ ᐊᒻᒪᓗ ᑐᐊᐸᒃ ᐊᑐᕐᑕᐅᓂᐊᕐᑐᑦ ᖃᓕᕐᓯᔪᑕᐅᓗᑎᒃ. ᖁᐊᖑᓂᖓᓄᑦ ᑎᑭᐅᒪᑎᓐᓇᓱᒃᖢᒍ ᓴᐅᔭᐅᓕᕈᓂ ᐃᔪᓂᕐᓴᐅᒐᔭᕐᑐᖅ ᖃᑐᖃᖓᓂᑦ. ᐊᐅᓚᑎᓪᓗᒍ ᐅᔭᖁᒃᓂᐊᓚᐅᑲᒃᑎᓪᓗᒋᑦ ᐃᒥᕈᔪᓂᖓ ᑯᒃᐸᓪᓕᐊᔪᖅ, ᓄᖑᑉᐸᓪᓕᐊᓂᖓᓗ ᐊᒻᒪᓗ ᑲᑕᒐᕐᐸᓪᓕᐊᓂᖓ ᖃᐅᔨᓴᕐᑕᐅᖃᑦᑕᕿᔭᕐᑐᖅ. ᐊᕙᓗᔭᐅᔨᐊᖏᑦᑐᖅ ᓴᕕᖁᔭᒃᒥᒃ ᐱᔪᑎᒋᓪᓗᒍ ᐊᒃᑕᕐᑕᐅᖃᑦᑕᕐᑐᑦ ᓇᒧᖓᐅᕙᓪᓕᐊᒐᔭᖏᒻᒪᑕ ᐊᒻᒪᓗ ᐅᒪᔪᓄᑦ ᐱᓇᓱᒃᑕᐅᒐᔭᖏᒻᒪᑕ ᐊᒻᒪᓗ ᐃᓄᒃᓄᑦ ᐅᐸᒃᑕᐅᔭᕆᐊᖃᔭᐊᖏᓐᓂᖓᓄᑦ.

ᐊᐅᓚᑕᐅᓂᖓᓄᑦ ᑲᒪᒋᔭᐅᓂᖓᓄᓪᓗ ᐊᑐᐊᒐᐅᔪᑦ ᐃᓚᒋᓕᐅᑎᓯᒪᔪᑦ ᑕᓱᒧᖓ ᑎᑎᕋᕐᒧᑦ ᐱᔭᓇᐊᖃᕐᓂᖏᑦ ᒪᓕᒃᖢᒋᑦ ᓄᓇᕗᑦᒥ ᐃᒥᓕᕆᔨᒃᑯᑦ. ᐱᖃᓯᐅᑎᓪᓗᒋᑦ ᐃᖃᓇᐃᔭᕐᑎᓄᑦ ᑲᒪᒋᔭᐅᓗᓂ ᐅᖃᐅᓯᐅᖃᑦᑕᕐᓗᓂᓗ. ᖃᐅᔨᓴᕐᓂᐅᔪᖅ ᒪᓕᒃᓯᒪᓂᐊᕐᑐᖅ ᐊᓯᖏᓄᑦ ᖃᐅᔨᓴᕐᑕᐅᕙᓪᓕᐊᔪᓄᑦ ᐃᓚᖃᓯᐅᔭᐅᓗᓂ. ᐊᒃᑕᕐᕕᒃ ᖃᓄᐃᔪᑕᐅᔭᐊᖏᑦᑐᖅ ᐃᒥᕐᒧᑦ ᑯᒃᐸᓪᓕᐊᔪᒧᑦ ᐱᔪᑎᒋᓪᓗᒍ ᓇᒧᖓᐅᕙᓪᓕᐊᒐᔭᖏᒻᒪᑦ ᐃᒥᑕᐅᕐᑕᑐᑦ. ᐊᒻᒪᓗ ᖁᐊᖑᓂᖓᓄᑦ ᓄᓇ ᐊᑕᓂᑦᑐᖅ, ᐊᕿᒃᓯᔪᖃᕐᑐᖅ ᓄᓇᒥᖓᑦ ᐃᒥᐅᓂᖓ ᐱᐅᑎᓐᓇᓱᒃᑲᓐᓂᕐᒥᒃ. ᐊᒻᒪᓗ ᓴᕿᑦᑎᕙᓪᓕᐊᐳᐊᖏᓗᓂ ᓱᕐᓇᕐᑐᖃᒃᓯᕐᒪᑕ, ᓂᕿᕕᓂᐅᖏᓪᓗᑎᒃ ᐊᒻᒪᓗ ᓇᒧᖓᐅᕙᓪᓕᐊᖏᓪᓗᑎᒃ ᐃᒋᑕᐅᖃᑦᑕᕐᑐᑦ. ᑕᐃᒪᐃᓂᖓᓄᑦ ᐳᔪᕐᓗᒃᒧᑦ ᓴᐳᓐᓂᐊᕈᑎᑦ ᐃᓕᔭᐅᔨᐊᖏᑦᑐᑦ ᐊᒃᑕᕐᕕᒥ.

ᐊᐅᓕᓂᖏᑦ ᐃᓕᒋᓗᓂᐅᖅ ᐊᕿᒍᓪᑦ ᐅᓂᒃᓕᐊᖓᔪᓪᑦ ᐃᓕᖅᓴᐅᑎᑐᕐᕿᑦ ᖃᓄᑎᑦ ᐊᖏᑎᑎᔪᒥᖅ ᐊᐱᑦᕕᖅᓗᐊᕐᓴᖅᓗᖏᑦ, ᐊᐱᑦᕕᖅ ᓴᓇᓵᐅᓂᖏᓂᖅ, ᖃᐅᔨᓴᕐᑕᐅᓴᒪᓂᖏᓂᖅ, ᖃᓄᐃᓗ ᐊᑯᓂᐅᑎᑎᔪᒥ ᐊᑐᐢᓇᖏᓐᓂᑦ, ᐊᖏᓗ ᐊᐢᐅᓕᑎᓐᓂᖅ ᐱᖃᓴᐅᐢᐅᓗᑎᒃ.

ᒪᑐᐅᓕᕐᓴᑦ ᐊᐱᑦᕕᖅ ᐊᖏᖅᑕᐅᓂᐊᕐᓂᖅ ᐊᑯᓂᐅᔪᒪᑦ ᖃᓄᐃᐅᕐᑕᐃᓕᓚᓗᒍ ᐊᐸᑎᑦᑎᐢᓄᑦ. ᐊᖏᓚᓗ ᓄᓇᕗᑦ ᐃᒥᓕᓴᕆᓄᑦ ᖃᐅᔨᑎᑕᐅᓂᐊᕐᓂᑦ ᑕᖏᑦ 6 ᓯᕗᓂᐊᓂ ᐊᐱᑦᕕᖅ ᒪᑐᐅᓂᐊᕐᔨᕐᓴᑦ ᐊᖏᓗ ᖃᐅᔨᓴᕐᑕᐅᓭᐅᑲᑎᖅᑎᐢᓗᒍ ᒪᑐᓂᐊᕐᓂᖅᓄᑦ ᖃᐅᔨᓴᕐᑕᐅᓗᓂ ᖃᖅᖏᓄᑦᓂᓗ ᖃᐅᔨᓴᕐᑕᐅᔪᓐᓇᐅᒪᖅᓯᖅᓴᑦ, ᑎᑎᕐᓯᒪᓗᑎᒃ ᑭᓯᑦ ᖃᐅᔨᓴᕐᑕᐅᒪᖅᓴᖅᓱᑦ ᐊᖏᓗ ᒪᓕᓴᓯᒪᓂᖅᓯᓂᓄᑦ ᒪᓕᖅᓱᓂ. ᖃᓕᕐᑕᐅᓯᒪᓕᕐᓴᑦ ᓴᐅᔨᐅᓗᓂ ᖃᖅᓚᓗ ᖃᓄᐃᖅᑎᑐᐊᕐᓗᓂ, ᒪᑐᓯᓯᒪᓗᑎᒃ ᑭᓯᑦ ᖃᐅᔨᓴᕐᑕᐅᒪᖅᓴᖅᓱᑦ ᐊᖏᓗ ᒪᓕᓴᓯᒪᓂᖅᓯᓂᓄᑦ ᒪᓕᖅᓱᓂ. ᖃᓕᕐᑕᐅᓯᒪᓕᕐᓴᑦ ᓴᐅᔨᐅᓗᓂ ᖃᖅᓚᓗ ᖃᓄᐃᐅᖅᑎᑐᐊᕐᓗᓂ, ᒪᑐᓯᒪᓕᕐᑎᓐᓗᒍ ᖃᐅᔨᓴᕐᑕᐅᓴᖅᓱᑦ ᓄᓇᕗᑦ ᖃᓄᐃᐅᓕᓕᕐᑕᐊᕐᓂᖅᓯᓂᓄᑦ ᑕᕆᔨᐊ Baffinland ᑎᑎᕋᖅᓯᑦ ᐅᓂᒃᓕᐅᖅᓗᓂᖅ ᓄᓇᕗᑦ ᐃᒥᓕᓴᕆᓄᑦ ᐊᑐᕐᕿᓂᐅᔨᓗᒍ ᖃᐅᔨᓴᕐᑕᐅᔪᓐᓇᖅᓱᑦ ᓴᐅᔨᐅᓯᒪᓕᕐᑎᓐᓗᒍ ᐊᖏᓕᖅᓴᖅ.

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MARY RIVER PROJECT

BULK SAMPLING PROGRAM
LANDFILL DESIGN AND OPERATIONS
(REF. NO. NB102-00181/10-6)

TABLE OF CONTENTS

PAGE

FIGURES

DRAWINGS

APPENDICES

BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT

BULK SAMPLING PROGRAM
LANDFILL DESIGN AND OPERATIONS
(REF. NO. NB102-00181/10-6)

SECTION 1.0 - INTRODUCTION

1.1 PROJECT BACKGROUND

Baffinland Iron Mines Corporation (Baffinland) is developing its Mary River iron ore deposits in the North Baffin region of Nunavut, Canada. The location of the Mary River Project is shown on Figure 1.1. Site coordinates are approximately Latitude 71°20' north and Longitude 79°14' west.

Baffinland is currently undertaking advanced exploration at the Mary River Project site, consisting of delineation drilling of the iron ore deposit. Baffinland started mineral exploration activities at the Mary River Project in 2004.

1.2 BULK SAMPLING PROGRAM

Baffinland is undertaking a Bulk Sampling Program in 2007 and 2008 in order to prove the marketability of the Mary River Project ore and secure long-term customers. The program includes the extraction of 250,000 t of iron ore from one small open pit from Deposit No. 1 and the provision of the material to potential customers.

The Bulk Sampling Program involves upgrades to the existing Tote Road to support haul truck traffic, construction of a larger camp to support the program and development of a small landfill site. An ore stockpile will be required at Milne Inlet and in August 2008 the ore will be loaded on ships for transport to steel mills in Europe.

1.3 EXISTING WASTE MANAGEMENT OPERATIONS

Prior to initiation of the bulk sample program, all solid waste generated as part of the work program was returned to Mary River for disposal. Solid waste such as domestic kitchen refuse and paper was incinerated daily at the Mary River Camp in a two-stage commercial incinerator. Upon commencement of the bulk sample program, a commercial two-stage incinerator was also commissioned for use at Milne Inlet. Incinerators will be installed at Steensby and Rail Camps in 2008. Non-hazardous wastes too bulky and/or not suitable for incineration are temporarily stored in designated locations at Mary River and Milne Inlet. These wastes generally consist of wood, plastics, metals as well as the ashes generated from the camp incinerators. These wastes will be disposed of at the landfill upon commissioning. The locations of the camp incinerators and designated waste storage areas are shown on Figures 1.2 to 1.5.

1.4 SCOPE OF REPORT

The existing, temporary waste management system is not adequate to support the needs of the Bulk Sampling Program. Therefore, a new, permanent landfill site is required. Based on discussions with the Nunavut Water Board (NWB), the Bulk Sample Landfill Site is considered to be a modified landfill. Therefore, the landfill has been designed in accordance with the "Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories" (Ferguson, Simek Clark Engineers & Architects, 2003) (the Guidelines).

This report presents the landfill design and operations for the Bulk Sampling Program. The report discusses the siting criteria and other design criteria, details on the waste (i.e. composition, volumes), disposal method and monitoring programs.

SECTION 2.0 - PLANNING OF THE LANDFILL SITE

2.1 GENERAL

As indicated in the previous section, a permanent landfill site is required for the Mary River Project. Non-hazardous waste, including ashes from the incineration process and waste which cannot be salvaged or incinerated will be deposited in the new landfill site. This section discusses the physical characteristics of the waste, reasoning for the landfill location, operational monitoring requirements and geotechnical characteristics of the site.

2.2 SOLID WASTE PHYSICAL CHARACTERISTICS

Non-hazardous wastes will report to the landfill from the Mary River Camp as well as from remote support camps. Various physical characteristics for the waste were determined as part of the design process for the landfill. These include the approximate waste volume and density, materials composition and compaction rates (the Guidelines, Section 2.2, Page 8). Each of these is discussed below.

2.2.1 Approximate Waste Volume

The design quantity for the landfill site was selected based on estimated waste volumes for similar projects. In the Screening Document (Knight Piésold, 2006) the volume of waste material to be placed in the landfill as a result of the Bulk Sampling Program, including waste currently stored in the temporary area and the camps noted above, was estimated to be 2,000 m^3. This volume is based on the projected schedule for the Bulk Sampling Program of 2 years. Using this volume plus cover material and some room for contingency, the estimated volume of waste for the proposed landfill is 5,000 m^3. It is noted that the area is capable of a larger capacity.

2.2.2 Waste Density

The Guidelines (Section 2.2.2, Page 9) state that a density of 0.099 t/m^3 is acceptable for uncompacted waste in the Northwest Territories (NWT). The density of waste within the landfill site will most likely be greater than this due to the high percentage of high density materials, such as scrap steel and plastics.

2.2.3 Materials Composition

As indicated above, the majority of the non-hazardous waste being produced at the Mary River Project is either salvaged or incinerated. The remainder of the non-hazardous waste will be deposited in the landfill and mainly consists of scrap steel, plastics, rubber, wood, and ashes from the incineration process. Hazardous wastes will not be deposited in the landfill. Therefore, the landfill will contain non-hazardous solid industrial waste, ashes and sand and gravel cover material. Bulky wastes from the 1960s exploration program, currently being stored in the temporary laydown area, will be inspected for any hazardous

contents and will also be placed into the proposed landfill if acceptable. Any hazardous wastes encountered will be disposed of as indicated in the next sub-section.

2.2.4 Hazardous and Bulky Wastes

The following wastes will not be accepted at the landfill:

- Liquid industrial wastes
- Wastes that are toxic or hazardous in nature

Liquid industrial wastes will be disposed of in accordance with the Used Oil and Waste Fuel Management Regulations (NWT, January 2000). Toxic or hazardous wastes will be disposed of off site at an approved facility, in accordance with the Guideline: General Management of Hazardous Waste in Nunavut (Nunavut, January 2002).

Bulky wastes (the Guidelines, Section 2.2.5, Table 10) which cannot feasibly be salvaged may be deposited into the landfill site. These items will be drained of all fluids (i.e. fuel, hydraulic fluids, oils) prior to disposal. The fluids will be disposed of in the same manner as liquid industrial wastes or hazardous wastes, as applicable.

2.2.5 Compaction Rates

A compaction rate of 3:1 is recommended for a modified landfill, as indicated in the Guidelines (Section 2.2.6, Page 10). Due to the high density materials to be deposited into the landfill, a conservative compaction rate of 1:1 has been used.

2.3 PLANNING HORIZON

The Guidelines state that all new landfills should be planned based on a 40 year planning horizon (the Guidelines, Section 2.3, Page 11). However, due to the short-term nature of the Bulk Sampling Program, the landfill has been planned based on 2 years of operations plus 1 year of closure activities. Additional capacity could be available at this site if required in the future.

2.4 WASTE COLLECTION FREQUENCY AND PRACTICES

Waste will be collected by designated Baffinland employees and disposed of in the landfill on a regular basis. Waste will be transported by pickup truck/all terrain vehicle or dump truck, depending on the size and nature of the waste.

2.5 SITING OF THE LANDFILL

An options review was completed to determine the optimum location for the landfill site based on the requirements of Section 2 (Page 8 - 18) of the Guidelines. The preferred location is southeast of the upper basin of Sheardown Lake as shown on Drawing 101. The area is undisturbed and gently slopes towards Sheardown Lake.

The location was selected using the Guidelines and specific Bulk Sampling Program related requirements. The specific rationale for the preferred landfill site location is as follows:

Criterion (The Guidelines, Table 2.3, Page 13 – 14)	Details
Area sufficient for a facility with a capacity for at least a 40-year life	The landfill has been sized for the 2 year life of the Bulk Sampling Program and 1 year of closure. Additional capacity could be available at this site if required in the future.
Areas in flood plain	The landfill is not located in a floodplain.
Climatic conditions of region; geological and terrain conditions of site	These have been considered and taken into account in the design.
Cover material availability	Cover material will come from a local borrow source (as shown on Drawing No. 101).
Distance from airport to avoid hazard to aircraft from scavenging birds	The landfill site is located approximately 1.5 km from the end of the airstrip, which is greater than Transport Canada's requirement of 1 km.
Distance from community to avoid unsightliness, odour, and smoke	The landfill is on the far side of a low hill from the mine site infrastructure and is not highly visible from the main road. No communities are nearby.
Distance from community to minimize construction and maintenance costs of access road	The access road has been located to minimize these. The site is located less than 1 km from the proposed Bulk Sampling Program stockpile area to reduce the footprint of the operations and to keep the access road short. No communities are nearby.
Distance from housing	The landfill is more than 2 km from the camp to reduce any possible visual impacts, as well as noise from equipment.
Distance from public roads, railways, right-of-ways and cemeteries	N/A: no public roads, railways, right-of-ways or cemeteries are present in the proposed landfill site area.
Distance from surface water to minimize fisheries habitat impacts	The landfill is more than 30 m from the high water mark for Sheardown Lake and any potential fish habitat streams.
Distance from tree line	N/A
Geotechnical features of the site	These have been considered. Drillhole MRL 004 encountered bedrock at 2 m depth.

Criterion (The Guidelines, Table 2.3, Page 13 – 14)	Details
Located to ensure protection of drinking water	The landfill site is located in a separate watershed from the drinking water source, ensuring that the water supply for the Bulk Sampling Program, Camp Lake, will not be impacted by the landfill.
Located to ensure protection of national/territorial parks, game and wildlife reserves, special fisheries areas	Fisheries and wildlife studies of the project area have been completed and the landfill has been sited in consideration of these studies. The stream which the landfill site access road crosses is not fish habitat.
Minimize impacts to land, birds, animals, vegetation	The waste will be inert and therefore should not impact these. Programs will be put in place to monitor this.
Zoning	N/A
Wind direction	N/A: no significant odours are expected to originate from the landfill.
Snow Accumulation	This has been considered. If necessary, snow fences will be installed to help minimize snow drifting.

In addition to the above criterion, the limits of the landfill site will remain a minimum of 33 m away from any recorded archaeological sites.

The proposed location of the landfill was submitted to Transport Canada for approval. Transport Canada regulations generally require that a landfill be situated at least 3 km from an airstrip. Because the inert waste at the landfill will not attract birds that could be potentially harmful to aircraft, Transport Canada has indicated that a minimum distance of 1 km is required. The landfill site is located approximately 1.5 km from the end of the airstrip.

2.6 MONITORING

2.6.1 Groundwater

According to the Guidelines, groundwater monitoring is not required as the population to be served by the landfill will be less than 1000 (The Guidelines, Table 2.4, Page 15). In addition, the landfill will be situated in a permafrost area and so there is essentially no groundwater present as it is frozen or extremely deep below surface. Therefore, impacts to groundwater are not expected.

2.6.2 Surface Water

Surface water in the area of the landfill generally flows towards Sheardown Lake. Extensive surface water monitoring has been ongoing at the Mary River Project site since 2005.

There are surface water monitoring locations downstream of the landfill site and in the receiving body for the proposed landfill site. There are no waterbodies directly upstream of the landfill site.

The surface water sampling generally takes place on a seasonal basis and the samples are analysed by Accutest Laboratories Ltd. in Ottawa and ALS Laboratory Group in Vancouver (metals only).

The landfill is not expected to significantly change the quality of surface waters in the area due to the inert nature of the waste and small landfill footprint.

The site topography is shown on Drawing No. 101 and in more detail on Drawing No. 500. The site drainage for the area surrounding the landfill site during operations and following closure will be relatively unchanged from the existing conditions. All surface water runoff from the site currently flows to Sheardown Lake and it will continue to flow there after the landfill site is constructed.

2.7 GEOTECHNICAL INVESTIGATION PROGRAM

The Mary River Project is located in the high arctic at approximately Latitude 71°20' north and Longitude 79°14' west. It is within the zone of continuous permafrost. Permafrost in the Mary River Project area can reach thicknesses of up to 500 m. The active layer extends from ground surface to depths of approximately 1 to 2.5 m. In coarser overburden with limited organic cover, the thickness of the active layer is anticipated to vary between 1.5 and 2.5 m based on a review of preliminary thermistor data collected in 2007. In finer materials or where organic cover is present, an active layer less than 1 m may be present.

A drilling program was completed for a proposed railway loop and included one drillhole (MRL 004) within the limits of the proposed landfill site. This drillhole was completed in June 2006 to identify the subsurface conditions in the area and a copy of the log is provided in Appendix A. The investigation program is described in detail in the Knight Piésold report "Rail Infrastructure - 2006 Site Investigation Summary Report" (2007).

The subsurface conditions recorded for drillhole MRL 004 are as follows:

- 0 to 1 m - organics
- 1 to 2 m - till
- 2 to 16.6 m - sandstone bedrock

Groundwater was not encountered as the area is underlain by permafrost. Based on the conditions recorded in drillhole MRL 004, an active layer thickness of 1 m has been assumed for the landfill site.

SECTION 3.0 - LANDFILL DESIGN

3.1 GENERAL

The landfill design was completed as specified by the Guidelines as described below. The project site layout, including the borrow source for the cover material, is shown on Drawing No. 101. Plans of the various stages of the landfill (i.e. pre-development, operations and closure) as well as sections and details of the landfill site are shown on Drawing Nos. 500 and 501.

3.2 DESIGN LIFE

The Guidelines stipulate that a modified landfill must be designed for a minimum 40-year life (Section 2.3, Page 11). However, due to the short-term nature of the Bulk Sampling Program, a design life of approximately 3 years, including closure, was used.

3.3 PERMAFROST ENCAPSULATION DURING OPERATION AND CLOSURE

In order to achieve permafrost encapsulation in the landfill site, the final cover will be thicker than the active layer (The Guidelines, Section 3.3, Page 19). Based on an active layer approximately 1 m thick, the final cover will be 1.5 m thick.

3.4 WASTE DISPOSAL METHOD

The area method will be used for waste disposal (The Guidelines, Section 4.2.1, Page 26). As shown on Drawing Nos. 500 and 501, low height berms (2 m high) will be constructed along two sides of the landfill site and then waste will be disposed of against the berms and directly onto the ground downstream of the berms. Heavy equipment, such as a bulldozer, will pack the waste against the berms.

Sand and gravel will be used as the cover material for the landfill site (The Guidelines, Section 4.2.1, Page 26). This cover material will come from the Mary River borrow area located approximately 4 km northwest of the landfill site as shown on Drawing No. 101. The operational cover will be approximately 0.1 m thick between cells and approximately 0.3 m thick over the cells (The Guidelines, Section 4.1, Page 26). This cover will be placed during the spring or fall or when the waste deposited is 3 m wide (The Guidelines, Section 4.2.1, Page 26).

The placement of waste will progress down slope towards the northwest end of the site. Once waste has been disposed of over the entire area, the entire area will be covered with 0.3 m of cover material (The Guidelines, Section 4.2.1, Page 26). The cover material will be compacted and graded until the surface is level. Then a second 2 m high berm will be constructed on top of the material and the process will begin again. Further details, including the sequence of activities, are provided on Drawing No. 501.

3.5 FENCING

No fencing will be required as the inert waste should not attract wildlife, access to the area is restricted to authorized personnel, and waste will be regularly covered to reduce the risk of wind-blown material.

3.6 SIGNAGE

Signs will be posted at the access point to the area to advise those working on the Bulk Sampling Program, and the public, that the site is being used for solid waste disposal (as per The Guidelines, Section 3.10, Page 23). If applicable, hours of operation, emergency numbers, recycling information, etc., may be included on the signs.

3.7 WATER

3.7.1 Surface Water Flow

Flowing surface water will be prevented from entering the landfill site by the construction of a berm along the upper end of the site (i.e. the berm constructed above for waste placement) and berms along the sides of the site. The berms will be constructed as shown on Drawing No. 500, with a maximum height of 2 m, upstream (inside) side slopes of 3H:1V and downstream (outside) side slopes of 2H:1V. The crest width of the berms will depend on the equipment available. The landfill site area will be graded as required to promote drainage away from the landfill and to prevent pooling of water within the landfill or against the berms (as per the Guidelines, Section 3.11.1, Page 23).

Appropriate erosion and sediment control measures will be implemented as required through the use of silt curtains/fences, etc. Temporary sediment control measures will be used during all construction activities at the site.

3.7.2 Surface Water Quality

As indicated above, surface water monitoring will continue on a seasonal basis for baseline monitoring purposes.

3.8 GEOTECHNICAL ASSESSMENT

Due to the granular nature of the existing foundation soils and the presence of permafrost, it was determined that the slope stability of the perimeter berms and bearing capacity of the foundation soils would be adequate for the landfill. It was also felt that differential settlement of the foundation soils would not be an issue.

If settlement of the perimeter berms occurs, additional fill will be placed in the settled area to bring the berm crest back up to grade.

3.9 LEACHATE CHARACTERISTICS

Leachate is not expected as the waste to be deposited in the landfill will be relatively dry, inert and non-hazardous. Therefore no leachate collection system has been included in the design.

Also as indicated above, a perimeter berm will be constructed surrounding the landfill site. This will redirect surface runoff originating upstream of the landfill site, thereby minimizing the amount of water which might infiltrate the deposited waste.

3.10 GROUNDWATER PROTECTION SYSTEM

Due to the permafrost in the area, no groundwater protection system has been included.

3.11 LANDFILL GAS ASSESSMENT

Landfill gas is not expected to be an issue as the deposited waste will be non-hazardous, non-organic and inert. Also all chemicals will be diverted for proper hazardous waste disposal. Therefore a landfill gas collection system will not be installed in the landfill site.

SECTION 4.0 - SITE PREPARATION

4.1 SURVEY

A survey of the landfill site area will be completed after all site preparation work is completed and prior to construction of the initial berm and placement of any waste. The survey will be used to assist in estimating the volume of waste deposited in the landfill.

4.2 SITE PREPARATION OF LANDFILL AREA

Prior to any placement of waste, the existing ground within the landfill site limits will be filled and graded as required to provide a gently sloping surface. Low areas will be filled with sand and gravel material and the entire area will be graded to promote drainage away from the landfill and towards Sheardown Lake.

4.3 ACCESS ROAD

An access road will be constructed from the existing Tote Road to the proposed landfill site. There will be one small stream crossing along the road alignment which will consist of culverts sized accordingly for the upstream catchment area. This stream has already been assessed as not being fish habitat.

SECTION 5.0 - OPERATIONS AND MAINTENANCE MANUAL

5.1 GENERAL

The landfill that is required for the Bulk Sampling program is classified as a modified landfill, and operations and maintenance of the site will be based on the Guidelines to ensure protection of the environment and the health and safety of individuals. The site will be used for non-hazardous solid industrial waste and ashes, with sand and gravel cover material. The estimated volume of waste to be deposited in the landfill is 5000 m^3, which includes the cover material. The total capacity of the site is much greater. The landfill will be situated as shown on Drawing 101. This manual will assist landfill site operators in establishing a proper waste management system and in ensuring that the system operates efficiently and in accordance with the Guidelines.

5.2 OPERATIONS

5.2.1 Responsibilities

Baffinland or an appointed, qualified contractor is responsible for the operation of the landfill. The Operator's duties include, but are not limited to:

- Ensuring that only Baffinland employees and on-site contractors deposit waste at the landfill
- Ensuring that individuals responsible for landfill operation are adequately trained
- Ensuring that only appropriate waste materials enter the landfill site, as described in Section 5.2.6 of this report
- Keeping track of areas filled, areas requiring cover, the need for heavy equipment and cover materials, and other aspects of daily operations
- Applying cover material over waste as required
- Using and maintaining equipment suitable for landfill operations
- Ensuring good housekeeping associated with landfill operations
- Maintaining access routes to the landfill
- Ensuring regular site monitoring occurs
- Operating the landfill in such a way as to minimize closure requirements

5.2.2 Operating Life

The Guidelines stipulate that a modified landfill must be designed for a minimum 40-year life (Section 2.3, Page 11). However, due to the short-term nature of the Bulk Sampling Program, a design life of approximately 3 years was used, which includes 2 years for general operations and one year for closure.

5.2.3 Access

Access to the landfill will be limited to designated Baffinland employees. The project's remote northern location, and the siting of the landfill approximately 2 km from the main

camp, will also aid in this effort. Unauthorized access to the site will be reported to the Operator.

5.2.4 Signage

As per the Guidelines (Section 3.10, Page 23), signs will be posted at all access points to the area to advise those working on the Bulk Sampling Program, and the public, that the site is being used for solid waste disposal, and what types of waste are acceptable. If applicable, emergency numbers, recycling information, etc., may be included on the signs.

5.2.5 Housekeeping

Baffinland will ensure proper housekeeping practices at the landfill site and associated operations. Due to the inert nature of the waste, wildlife issues with bears, birds, rodents, etc. are not anticipated. Regardless, regular housekeeping will be maintained to help ensure human health and protection of the surrounding environment.

5.2.6 Waste Composition

The landfill site will be available for disposal of inert waste associated with the Bulk Sampling Program, and existing waste that is in temporary storage. The refuse will consist mainly of scrap metal, plastic, wood, rubber, and ash generated from the incinerator. Ash will be placed in containers to help prevent wind distribution. Sanitary waste, burnable paper products, liquids, chemicals, and hazardous materials will not be stored or disposed of in the landfill. Any toxic or hazardous waste will be disposed in accordance with applicable regulations and/or off site at approved facilities. Items that may contain fluids will be drained prior to disposal in the landfill. The open burning of inert combustible wastes not otherwise incinerated will not be conducted unless otherwise approved by the appropriate agency.

5.2.7 Placement of Waste

Waste will be collected by designated personnel and disposed of in the landfill on a regular basis. Waste will be transported by pickup truck/all terrain vehicle or dump truck, depending on the size and nature of the waste.

Due to the presence of permafrost and rock, the area method will be used to place waste in the landfill (the Guidelines, Section 4.2.1, Page 26). Waste will be deposited on the ground, worked with appropriate heavy equipment (the Guidelines, Section 4.1, Page 26), and packed against a constructed berm. Construction of the berm will be advanced with the advancing face of the landfill. Once the first layer is complete and covered, a second layer will be formed. The sequence of actions is shown on Drawing No. 501 (the Guidelines, Figure 4-1, Page 28).

Compaction of the waste will be undertaken if required, depending on the nature of the waste. This will typically occur once per week or in combination with collection frequency,

depending on the nature of the waste. Generally, the waste will be worked and compacted as it is dumped (as per the Guidelines, Section 4.1, Page 26). The Guidelines state that a density of 0.099 t/m^3 is acceptable for uncompacted waste (Section 2.2.2, Page 9). This density will probably be exceeded in the landfill due to the dense nature of material being deposited (i.e. scrap metal, plastic). The proposed compaction rate of 3:1 in the Guidelines (Section 2.2.6, Page 10; Section 4.1, Page 26) is not expected to be feasible due to the anticipated high density of waste, so a conservative rate of 1:1 was used for planning purposes.

The placement of waste will progress down-slope towards the northwest end of the site. Once waste has been disposed of over the entire area of the landfill, this area will be covered with 0.3 m of cover material (the Guidelines, Section 4.1, Page 26). The cover material will be compacted and graded until the surface is level. Then a second, 2 m high berm will be constructed on top of the material and the process will begin again, with the berm being advanced as necessary dependent on waste deposited. Further details, including the sequence of activities, are provided on Drawing No. 501.

Sand and gravel will be used as the cover material for the landfill site (the Guidelines, Section 4.2.1, Page 26), and will be obtained from the Mary River borrow area located approximately 4 km northwest of the landfill site, as shown on Drawing No. 101. The operational cover will be about 0.3 m thick over the waste layers. This cover will be placed during the spring or fall or when the waste deposited is 3 m wide (the Guidelines, Section 4.2.1, Page 26). In order to achieve permafrost encapsulation, the final cover will be thicker than the active layer (as per the Guidelines, Section 3.3, Page 19). Based on an active layer of approximately 1 m, the final cover will be about 1.5 m thick.

5.2.8 Emergencies

Baffinland's Safety Program Guidelines (March 2007) will be followed in all aspects of landfill operation. Response to emergency situations will be according to this plan. First aid kits are located in all Baffinland vehicles and employees carry radios. Injuries and accidents must be immediately reported to the employee's supervisor.

5.3 MAINTENANCE

The landfill will be maintained in order to promote human health and protection of the environment. If required, maintenance will be completed as soon as possible.

5.3.1 Berms

Berms will be maintained to define the landfill limits, and to help contain the waste. If settlement of the perimeter berms occurs, additional fill will be placed in the settled area to bring the berm crest back up to grade.

5.3.2 Fencing

No fencing will be required as the inert waste should not attract wildlife, access to the area is restricted to authorized personnel, and waste will be regularly covered to reduce the risk of wind-blown material.

5.3.3 Surface Water Runoff

The site topography is shown on Drawing No. 101 and in more detail on Drawing No. 500. The site drainage for the area surrounding the landfill site during operations and following closure will be relatively unchanged from the existing conditions. All surface water runoff from the site currently flows to Sheardown Lake and it will continue to flow there after the landfill site is constructed. The landfill is not expected to significantly change the quality of surface waters due to the inert nature of the waste and small landfill footprint.

Flowing surface water will be directed away from the landfill site by the construction of a berm along the upper end of the site (i.e. the berm constructed for waste placement) and berms along the sides of the site. The berms will be constructed as shown on Drawing No. 500, with a maximum height of 2 m, upstream (inside) side slopes of 3H:1V and downstream (outside) side slopes of 2H:1V. The crest width of the berms will depend on the equipment available. The landfill site area will be graded as required to promote drainage away from the landfill and to prevent pooling of water within the landfill or against the berms (the Guidelines, Section 3.11.1, Page 23).

5.3.4 Erosion

Appropriate erosion and sediment control measures will be implemented as required through the use of silt curtains/fences, etc. If significant erosion is observed, appropriate actions will be taken to stop the process and to correct the problem. This could include the use of surface grading, geotextiles, riprap-lined erosion channels, etc.

5.4 MONITORING

Routine monitoring will be conducted for all aspects of landfill operation to ensure that the site is being operated as intended. Refer to Appendix B for the 'Landfill Facility Inspection Form'.

5.4.1 Volume

Records will be kept of the volume of waste and cover materials placed in the landfill (the Guidelines, Section 4.5.1, Page 31). The annual volume of waste disposed of in the landfill will be determined based on survey information and on records of the amount of cover material used.

5.4.2 Materials Composition

The variety of materials that will be deposited in the landfill is limited as the majority of waste for the Bulk Sampling Program is either salvaged/recycled or incinerated. Therefore materials composition studies will not be undertaken as part of the Bulk Sampling Program to determine if a higher percentage of the waste can be diverted from the landfill (the Guidelines, Section 4.5.2, Page 32). However, records will be kept of the nature of the waste and cover materials placed in the landfill.

5.4.3 Water and Soil Sampling

The "Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites" (CCME, 1993) will be followed for water and soil quality monitoring (the Guidelines, Section 4.5.4, Page 32).

Seepage sampling will be undertaken annually at two locations downstream of the landfill. Sampling parameters will include: pH, alkalinity, conductivity, total dissolved solids (TDS), total suspended solids (TSS), phenols, nutrients, anions, total organic carbon (TOC), dissolved organic carbon (DOC), metals, and Oil & Grease. An appropriate number of samples (generally 10% of the total number of samples) will be collected for Quality Assurance / Quality Control.

Water sampling is being undertaken in the receiving water (Sheardown Lake) as part of routine baseline studies. Groundwater monitoring is not required as the landfill serves a population less than 1000 (the Guidelines, Table 2.4, Page 15). In addition, the landfill will be situated in a permafrost area with essentially no groundwater present. Thus, impacts to groundwater are not expected.

A baseline soil sampling program will be undertaken at several locations around the landfill site prior to construction of the initial perimeter berm. Sampling parameters will include: pH, alkalinity, conductivity, phenols, nutrients, anions, metals, and hydrocarbons. An appropriate number of samples (generally 10% of the total number of samples) will be collected for Quality Assurance / Quality Control.

5.4.4 Ground Temperature Monitoring

It is expected that the active layer will progress into the landfill waste and cover material. Therefore, ground temperatures are not expected to increase due to the presence of the landfill and the types of non-hazardous waste disposed of in the landfill.

During regular landfill inspections, signs of ground warming will be monitored by watching for evidence of soil creep, for example.

5.4.5 Leachate Monitoring

Leachate production from the landfill is not expected based on the relatively dry, inert nature of the waste to be placed in the landfill. Seepage monitoring described above will be used to confirm the negligible levels of leachate production.

5.4.6 Reporting System

Records of all site operations, including inspections, maintenance, and monitoring will be recorded on designated forms and kept together in the Baffinland office (or other on-site facility used for such purposes). This will be performed and maintained by the landfill Operator. If the Operator is a contractor employed by Baffinland, the Operator will report all information to the Baffinland site manager and will forward records for inspections, monitoring and maintenance as they are completed.

5.4.7 Routine Inspections

Routine visual inspections will be completed every two weeks by the Operator or designate for various components of the landfill, including, but not limited to: berms, fencing, surface water runoff, stray debris, erosion, ground warming, and any other evidence of conditions which depart from appropriate landfill operations. Records will be kept of all inspections and maintenance measures completed and will form part of the annual landfill site report.

5.4.8 Audits

Management will review records of all routine inspections to ensure that the site Operator is fulfilling their obligations.

5.4.9 Regulatory Reporting

Annual reporting regarding the landfill will be incorporated into the Annual Water License Report and will be submitted to the Nunavut water Board. The report will consist of information such as:

- Total volume of waste deposited in the landfill site during the previous calendar year
- Progression of the landfill site development, indicating the landfill site location currently in use, and any areas that have been closed
- Monitoring results
- Remaining life expectancy of the landfill site
- Photographs

Bulk Sampling Landfill Operation - Monitoring Summary			
Monitoring/Reporting	Frequency	Person Responsible	QA/QC
Overall Site Inspection (berms, runoff, stray debris, erosion, ground warming, etc.)	Every two weeks	Site Operator	Management review of records to confirm proper site operation
Volume Deposited in Landfill	Annual	Site Operator	Management review of records to confirm proper site operation
Materials Composition of Waste	Every two weeks	Site Operator	Management review of records to confirm proper site operation
Seepage Sampling downstream of landfill	Annually	Baffinland or Consultant	Routine QA/QC Sampling (equivalent to 10% of sampling locations)
Baseline Soil Sampling: Minimum of three sites within landfill footprint and two background locations (depending on final design size)	Prior to landfill construction	Baffinland or Consultant	Routine QA/QC Sampling (equivalent to 10% of sampling locations)
Landfill Report - incorporated into Annual Water License Report	Annual	Baffinland or Consultant	n/a

SECTION 6.0 - CLOSURE

6.1 GENERAL

Final closure of the landfill site will be conducted in a manner which ensures long-term protection of the environment, as discussed below. This will be conducted as part of the overall closure plan for the Bulk Sampling Program, and is referenced in the Abandonment and Reclamation Plan (Knight Piésold Ref. No. NB102-00181/6-7, Rev. 2, dated March 31, 2008). The NWB will be notified at least 6 months in advance of the landfill site closure.

6.2 CLOSURE REPORT

A Closure Report will be produced for the landfill and submitted for approval at least 6 months prior to closure (the Guidelines, Section 5.2, Page 35). The report will include discussions on the following:

- Future land use
- Leachate prevention and monitoring
- An implementation schedule
- Mapping which shows all disturbed areas and borrow material areas
- Consideration of altered drainage patterns
- Type and source of cover materials

6.3 GRADING AND CAPPING

The closure cover will consist of a 1.5 m thick soil cover over the entire surface of the landfill. The cover will be compacted and contoured to shed precipitation from the surface. It is anticipated that this cover will comprise 1.5 m of sand and gravel material. The entire area will then be allowed to revegetate naturally.

6.4 SURVEY

A final survey of the landfill site will be completed after completion of the closure cover. The survey will include any designated waste disposal areas, etc. (the Guidelines, Section 5.6, Page 36).

6.5 REGISTRATION

The landfill site will be identified as a Modified Solid Waste Management Facility on the land title documents (the Guidelines, Section 5.7, Page 37).

6.6 SIGNS

A sign will be posted to advise people that the site is closed and indicate an alternate facility for waste disposal (the Guidelines, Section 5.8, Page 37).

SECTION 7.0 - POST CLOSURE

7.1 INSPECTIONS

A post-closure inspection checklist will be filed with the NWB at least 6 months prior to closure. The checklist will include the following (the Guidelines, Section 6.2, Page 38):

- Inspection frequency
- List and description of items to be inspected
- Compliance requirements

The cover material will be allowed to settle and will be regraded as required to prevent standing water on the cover (the Guidelines, Section 6.1, Page 38). Perimeter berms will be inspected regularly to ensure they are performing as designed.

Once the final cover is in good shape Baffinland will submit a report to the NWB requesting cessation of the post-closure inspections.

7.2 MONITORING

The monitoring program established during operations (i.e. annual seepage and stability monitoring) will continue for a 5 year period, or earlier if it can be demonstrated that monitoring is no longer necessary. A report will be submitted to the appropriate regulatory body requesting cessation of post-closure monitoring (the Guidelines, Section 6.3, Page 38).

7.3 POST-CLOSURE REPORT

A post-closure report will be prepared as part of the Bulk Sampling Program abandonment and reclamation that summarizes the results of site inspections and monitoring, including maintenance completed (the Guidelines, Section 6.3, Page 38). The post-closure report will include the following:

- The results and an interpretive analysis of the results of all leachate, surface water and soil cover monitoring, including justification to cease the monitoring and inspection programs
- An assessment of the operation, maintenance and performance of, and a discussion of corrective action taken concerning the final cover i.e. erosion and/or vegetative cover and control, treatment, disposal and monitoring facilities for leachate and surface water
- Photographs

SECTION 8.0 - REFERENCES

1. Canadian Council of Ministers of the Environment, 1993. Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites, Volume I: Main Report and Volume II: Analytical Method Summaries. Winnipeg, Manitoba.

2. Ferguson, Simek Clark Engineers & Architects, 2003. Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories. April 21, 2003. Yellowknife, Northwest Territories.

3. Government of the Northwest Territories. Environmental Protection Act. Used Oil and Waste Fuel Management Regulations (Draft). Regulation 037. March 16, 2000. Yellowknife, Northwest Territories.

4. Government of the Nunavut. Guideline: General Management of Hazardous Waste in Nunavut. January 2002. Nunavut.

5. Knight Piésold Ltd., 2006. Baffinland Iron Mines Corporation, Mary River Project, Bulk Sampling Program, Environmental Screening Document, Volume I Report and Volume II Appendices, Ref. No. NB102-00181/6-1, Rev. 0. November 20, 2006. North Bay, Ontario.

6. Knight Piésold Ltd., 2007. Baffinland Iron Mines Corporation, Mary River Project, Bulk Sampling Program, Rail Infrastructure - 2006 Site Investigation Summary Report, Ref. No. NB102-00181/3-3, Rev. 0. March 26, 2007. North Bay, Ontario.

7. Knight Piésold Ltd., 2007. Baffinland Iron Mines Corporation, Mary River Project, Comprehensive Environmental Monitoring Plan, Ref. No. NB102-00181/10-3, Rev. 0. October 4, 2007. North Bay, Ontario.

SECTION 9.0 - CERTIFICATION

This report was prepared, reviewed and approved by the undersigned.

Prepared by: _____

Deena M.M. Duff, P.Eng.
Senior Engineer

Reviewed by: _____

Steven R. Aiken, P.Eng.
Manager Environmental Services

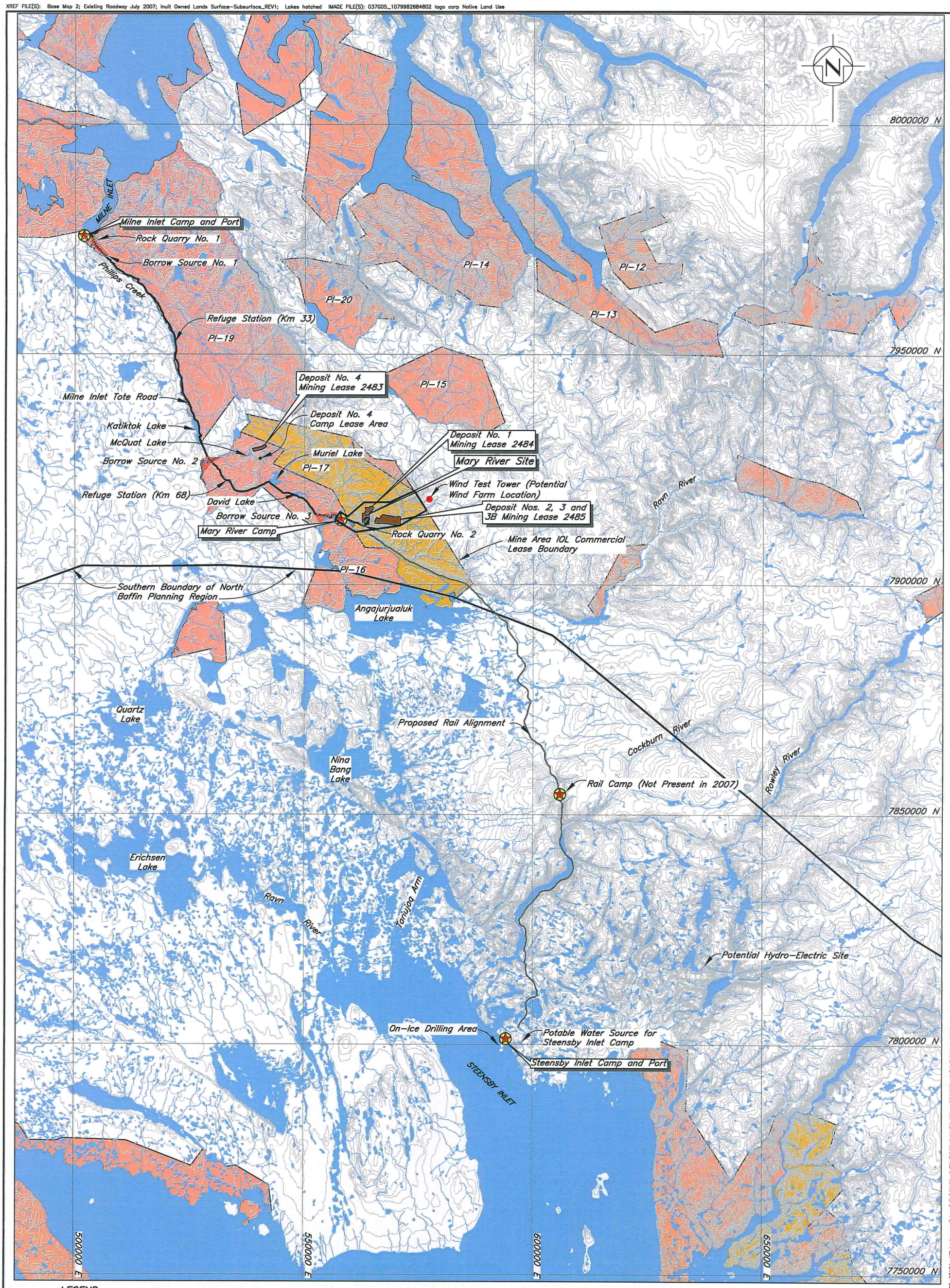
REGISTERED PROFESSIONAL ENGINEER
S.R. AIKEN
LICENSEE
MAR 31 2008
NWT/NU

PERMIT TO PRACTICE
KNIGHT PIESOLD LTD.
Signature _____
Date March 31 /2008
PERMIT NUMBER: P 547
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

Approved by: _____

Ken D. Embree, P.Eng.
Managing Director

XREF FILE(S): Base Map 2; Existing Roadway July 2007; Inuit Owned Lands Surface-Subsurface_REV1; Lakes hatched IMAGE FILE(S): 037G05_1079982884802 logo corp Native Land Use



LEGEND:

- River/Stream/Drainage
- Milne Inlet Tote Road
- Proposed Rail Alignment
- Contour
- Water
- Inuit Owned Land-Surface Only Excluding Minerals
- Inuit Owned Land-Surface and Subsurface Including Minerals
- Mineral Lease Boundary
- Crown Land
- Existing Borrow Area (IOL Commercial Lease)
- Existing Rock Quarry (IOL Commercial Lease)

NOTES:

1. Base Map: © Her Majesty the Queen in Rights of Canada, Department of Natural Resources (2004). All rights reserved.
2. Coordinate grid is shown in UTM (NAD83) Zone 17 and is in metres.
3. Contours are in metres. Contour interval varies.
4. Proposed Rail Alignment provided by Canarail Consultants Inc. in late 2007.

Scale 10 5 0 10 20 30 40 Kilometres

Baffinland Iron Mines Corporation

MARY RIVER PROJECT

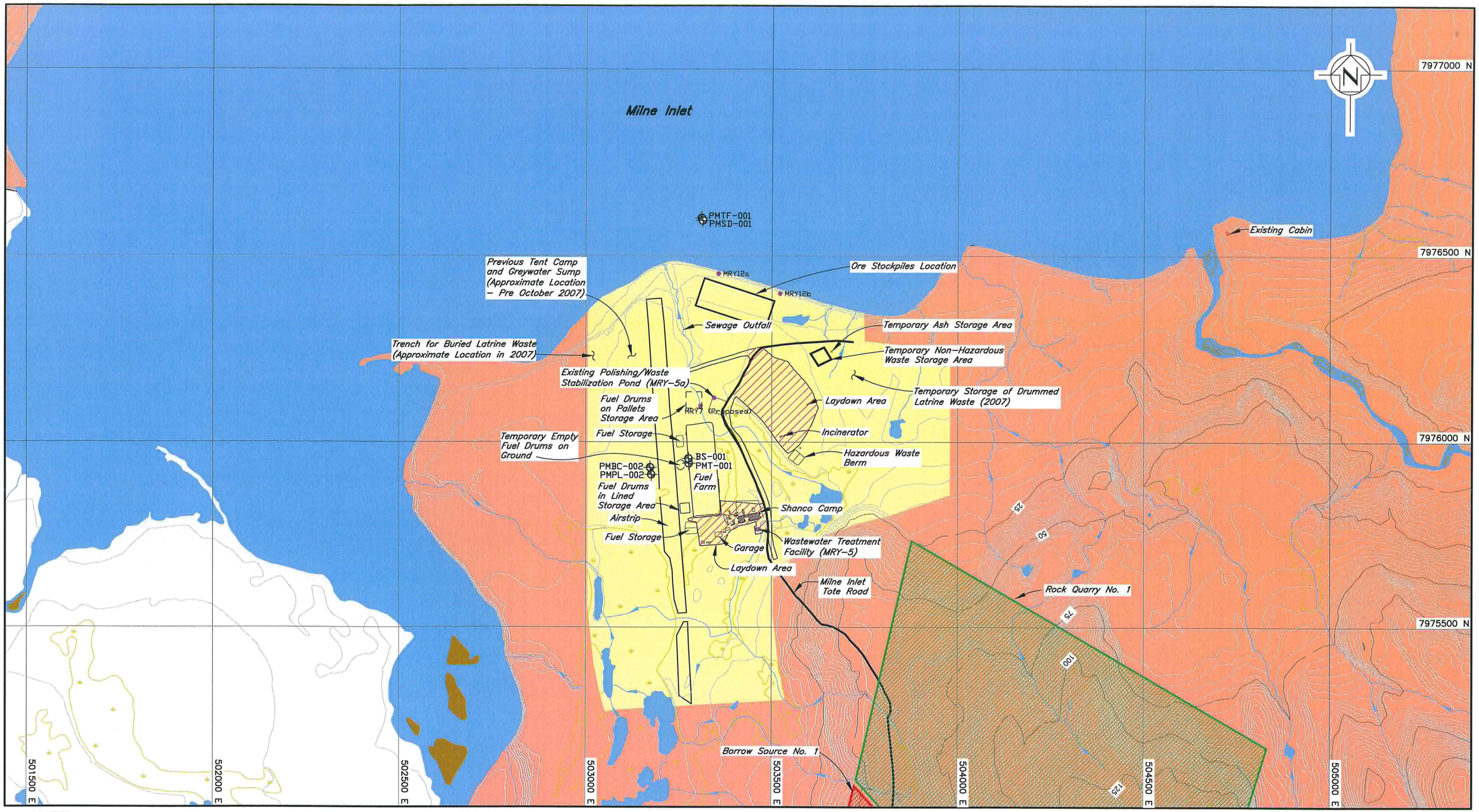
LOCATION OF PROJECT ACTIVITIES

Knight Piésold CONSULTING

P/A NO.	REF.	REV.
NB102-00181/10	8	1

FIGURE 1.1

NORTH BAY ON. SAVED: I:\102-00181-10\Assignment\Acad\Fig\B158, 3/31/2008 9:44:34 AM PRINTED: 3/31/2008 9:45:58 AM, LAYOUT, rjohnson



LEGEND:

- Water
- Inuit Owned Land–Surface Only Excluding Minerals
- Crown Land
- Laydown Area
- Surface Rights Area (IOL Commercial Lease)
- Existing Borrow Area (IOL Commercial Lease)
- Existing Rock Quarry (IOL Commercial Lease)
- Wetland
- Drillhole Completed in 2007
- River/Stream/Drainage
- Direction of surface water runoff
- Milne Inlet Tote Road
- Road
- MRY-5 Water Licence Monitoring Location

NOTES:

1. Topography provided by Eagle Mapping (2005).
2. Coordinate grid is shown in UTM (NAD83) Zone 17 and is in metres.
3. Contours are in metres. Contour interval is 2.5 metres.
4. Layout provided by BH Martin/Genivar and Baffinland (as of December 31, 2007).

Scale 100 50 0 100 200 300 400 500 Metres

Baffinland
Iron Mines Corporation

MARY RIVER PROJECT

MILNE INLET CAMP AND PORT LAYOUT

Knight Piésold CONSULTING

P/A NO.	REF.	REV.
NB102-00181/10	6	1

FIGURE 1.2

LEGEND:

- River/Stream/Drainage
- Spill Kit
- Tent

NOTES:

1. Airphotos provided by Eagle Mapping (2005) and ALS contour data provided by Terrapoint (2006).
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. Layout as of December 31, 2007 provided by BH Martin/Genivar and Baffinland.

Scale 30 15 0 30 60 90 120 150 Metres

Baffinland IRON MINES CORPORATION

MARY RIVER PROJECT

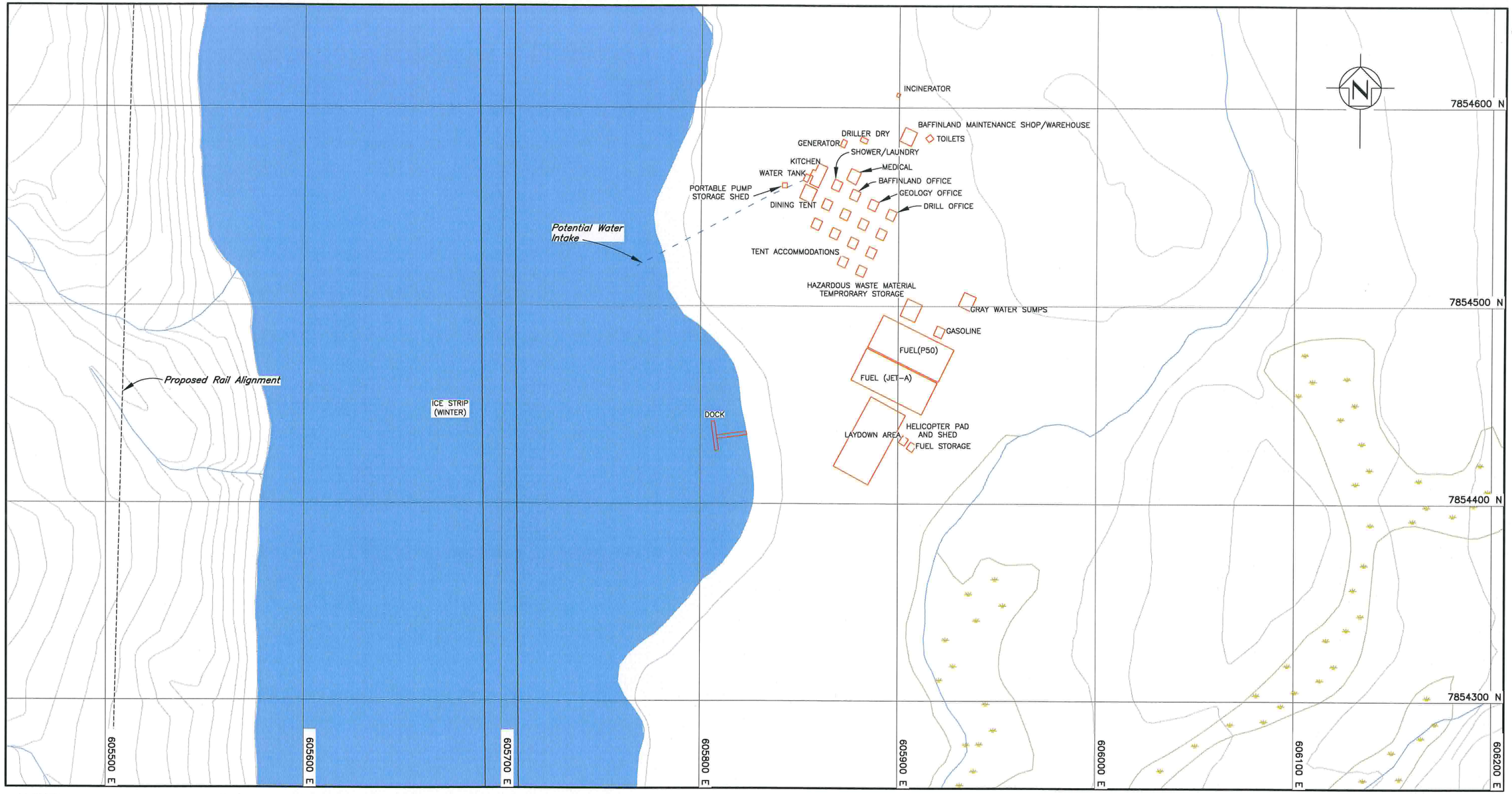
MARY RIVER SITE LAYOUT

Knight Piésold CONSULTING

P/A NO.	REF.	REV.
NB102-00181/10	6	1

FIGURE 1.3

XREF FILE(S): Mine Site Lidar; Mine_Site_Water Hatch; PROJECT SITE PLAN 2m INTERVAL_REV3 IMAGE FILE(S): logo-big corp edh Mary River 070820_Sheardown_Lake_North_BathyL Baffinland logo-big corp EagLogo
NORTH BAY ON. SAVED: I:\NB102-00181-10\Assignment\Vcad\Fig\Fig180. 3/31/2008 9:44:51 AM PRINTED: 3/31/2008 9:45:22 AM Layout1, bpark



LEGEND:

- Water
- Wetland
- River/Stream/Drainage
- Proposed Rail Alignment

NOTES:

1. *Topography provided by Eagle mapping (2005).*
2. *Coordinate grid is shown in UTM (NAD83) Zone 17 and is in metres.*
3. *Contours are in metres. Contour interval is 2.5 metres.*
4. *Proposed Rail Alignment provided by Canarail Consultants Inc. in late 2007.*
5. *Location of the proposed Rail Camp infrastructure is approximate and subject to field adjustment.*

Scale 20 10 0 20 40 60 80 100 Metres

Baffinland Iron Mines Corporation

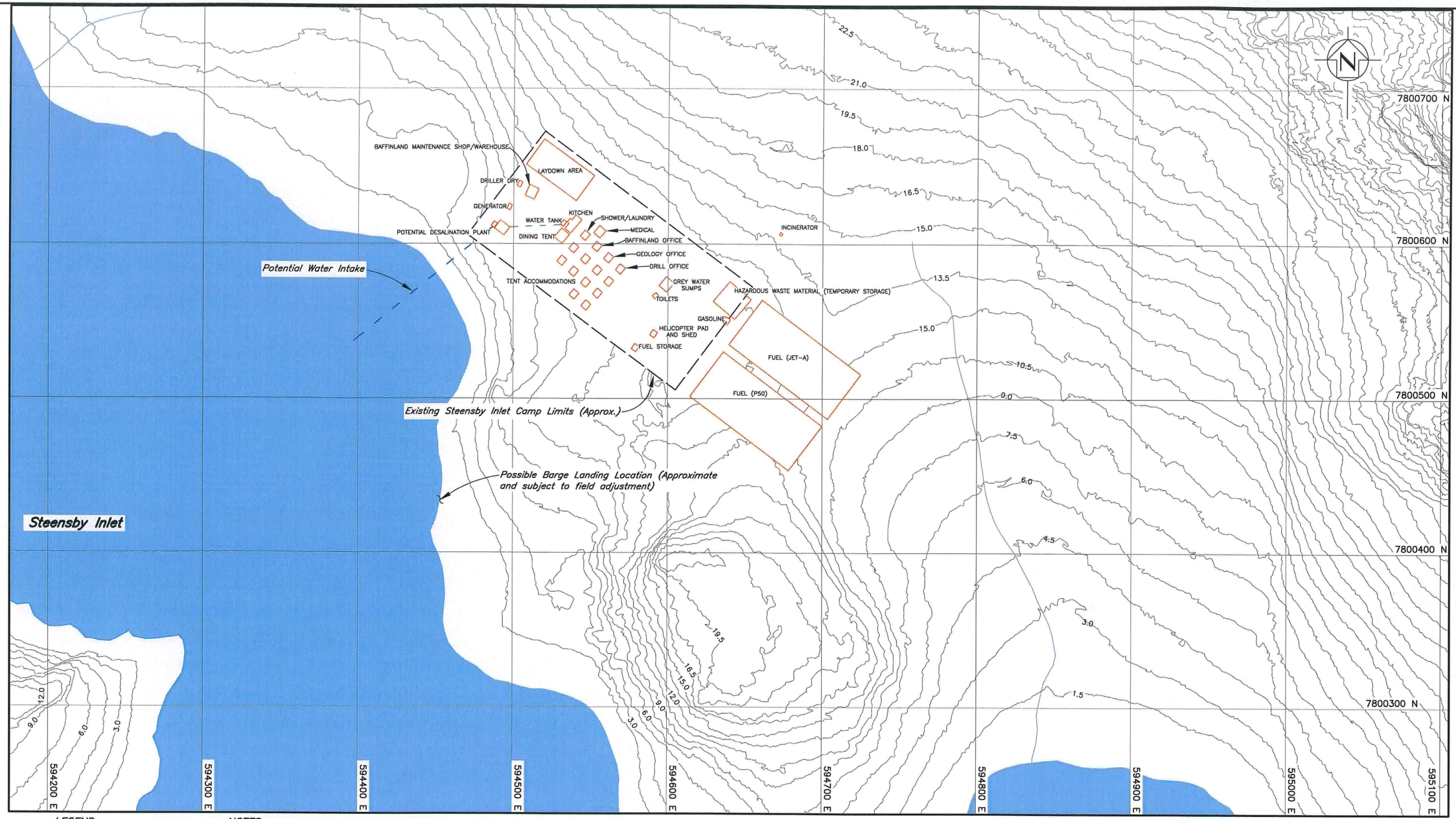
MARY RIVER PROJECT

RAIL CAMP
PROPOSED CAMP LAYOUT

Knight Piésold CONSULTING

P/A NO.	REF.	REV.
NB102-00181/10	6	1

FIGURE 1.4



LEGEND:

- Water
- Wetland
- River/Stream/Drainage

NOTES:

1. ALS contour data was provided by Terrapoint (2006).
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. No location details available for 2007 Steensby Inlet Camp with the exception of three existing tent structures including a kitchen/wash tent), an outhouse and two lined fuel storage areas, all infrastructure shown is proposed. Location of the proposed Steensby Inlet Camp infrastructure is approximate and subject to field adjustment.
5. The camp will consist of either tents (ie. weatherhaven) or trailers (ie. Shanco style). A tent camp is shown.

Scale 25 13 0 25 50 75 100 125 Metres

Baffinland Iron Mines Corporation

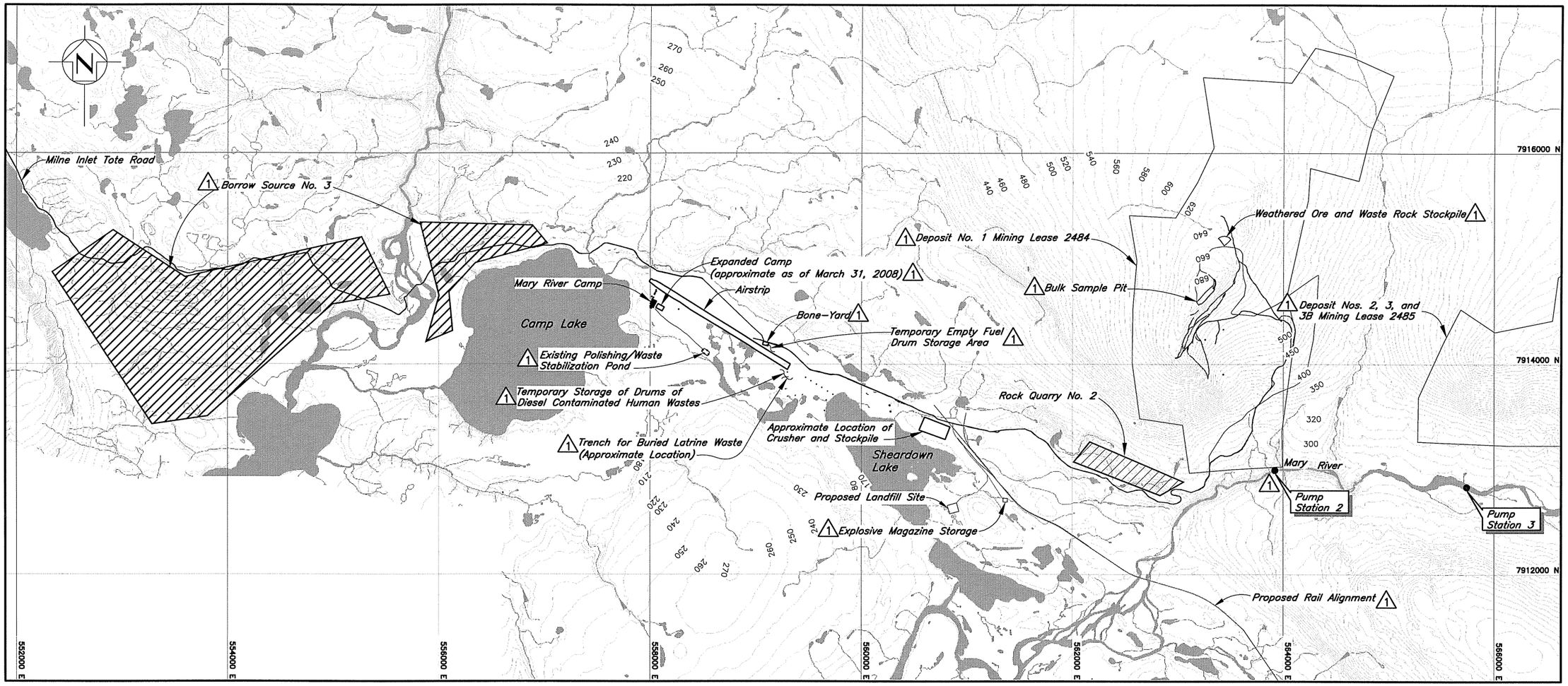
MARY RIVER PROJECT

STEENSBY INLET AREA PROPOSED CAMP LAYOUT

Knight Piésold CONSULTING

P/A NO.	REF.	REV.
NB102-00181/10	6	1

FIGURE 1.5



LEGEND:

- Water
- Borrow Source Location
- Rock Quarry Location
- River/Stream/Drainage
- Direction of surface water runoff
- Milne Inlet Tote Road
- Drill Road
- Proposed Rail Alignment
- Pump Station

NOTES:

1. Topography provided by Eagle Mapping (2005).
2. Coordinate grid is shown in UTM (NAD83) Zone 17 and is in metres.
3. Contours are in metres. Contour interval varies.
4. Layout as of December 31, 2007 provided by BH Martin/Genivar and Baffinland.
5. Some infrastructure not shown for clarity.

Scale 400 200 0 400 800 1200 1600 2000 Metres

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
REVISIONS						

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
1	27MAR08	UPDATED AND REISSUED	DD	MD/BSP		
0	13NOV07	ISSUED IN FINAL	DD	MD/BSP	BP	KDE
REVISIONS						

Knight Piésold CONSULTING

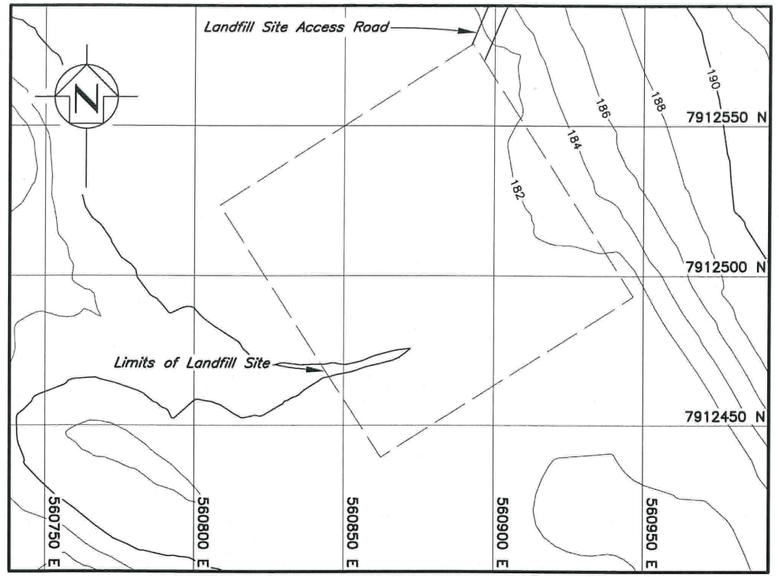
Baffinland Iron Mines Corporation

MARY RIVER PROJECT

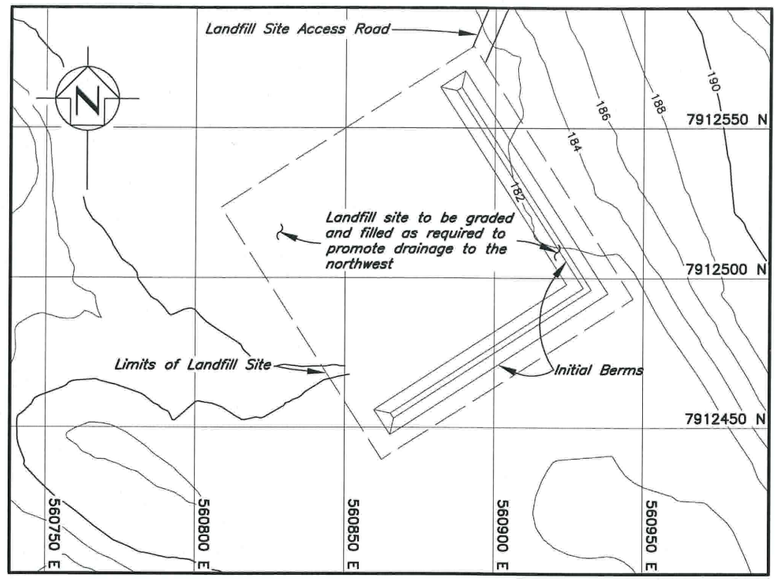
OVERALL SITE PLAN AND BORROW AREA LOCATION

P/A NO.	DRG. NO.	REV.
NB102-00181/10	101	1

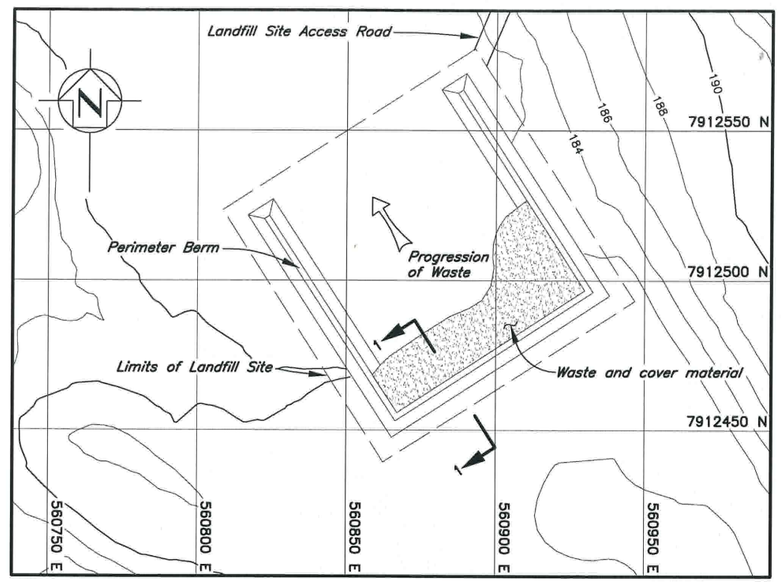
XREF FILE(S): Mine_Site_Water Hatch; WASTE DUMP AREA; Basemap_2.5m intervalA; ROCK SAMPLE LOCATION; Milne Routes Lakes; PROJECT SITE PLAN 2m INTERVAL_REV2 IMAGE FILE(S): Baffinland logo-big corp Baffinland logo-big corp_b+W Baffinland logo-big corp EsqLogo
NORTH BAY ON, CREATED BY: mdemers SAVED: I:\102-00181-10\Assignment\Acad\Dwg\101R1, 3/31/2008 4:25:52 PM PRINTED: 3/31/2008 4:27:00 PM, Layout1, rjohnson



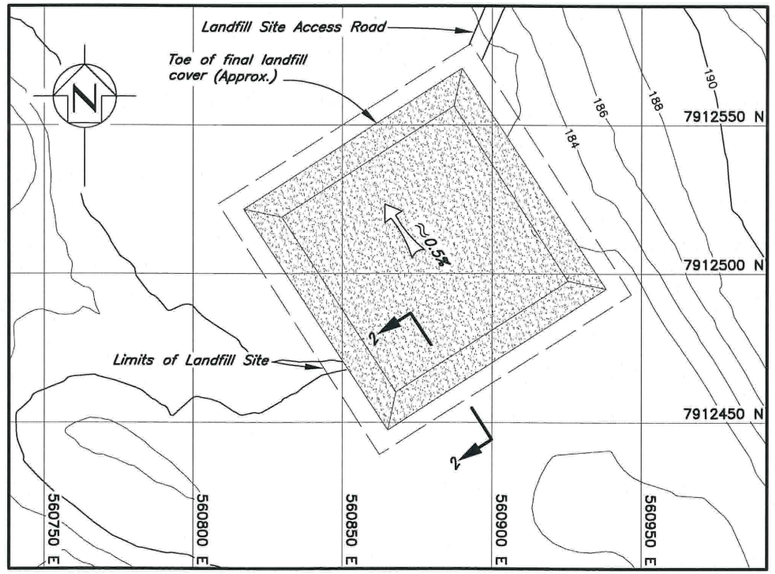
Existing Conditions



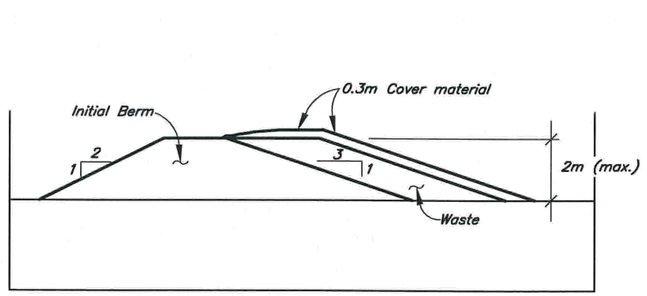
Site Preparation



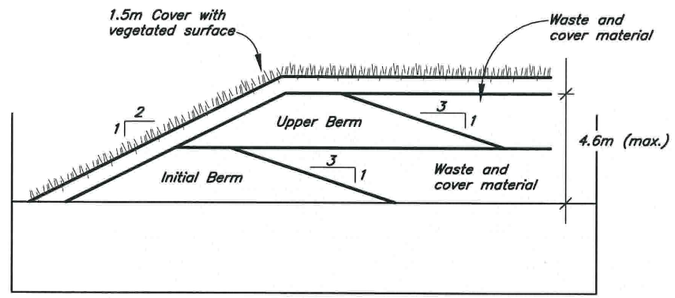
Operations



Closure



SECTION 1
N.T.S



SECTION 2
N.T.S.

LEGEND:

- Cover material
- Stream/River
- Road

NOTES:

1. Topography provided by Eagle Mapping (2005).
2. Coordinate grid is shown in UTM (NAD83) Zone 17 West and is in metres.
3. Contours are in metres. Contour interval is 2 metres.

Scale 20 10 0 20 40 60 80 100 Metres

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
REVISIONS						

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	13NOV07	ISSUED IN FINAL	DD	BSP		
REVISIONS						

Knight Piésold CONSULTING

Baffinland Iron Mines Corporation

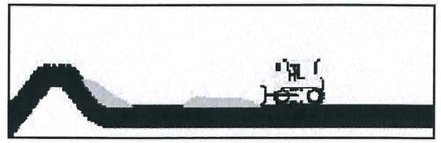
MARY RIVER PROJECT

LANDFILL SITE PLANS AND SECTIONS

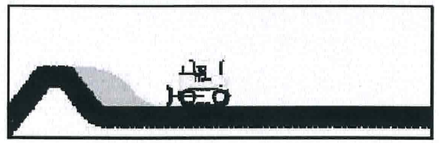
P/A NO.	DRG. NO.	REV.
NB102-00181/10	500	0

XREF FILE(S): MaryRiverPhs; Mine Site Ortho Photos; common_rev1; PROJECT SITE PLAN 2m INTERVAL IMAGE FILE(S): Baffinland logo-big corp Baffinland logo-big corp Baffinland logo-big corp_b+w Baffinland logo-big corp_b+w Baffinland logo-big corp EagLogo
NORTH BAY ON. CREATED BY: Bpark SAVED: I:\102-00181-10\Assignment\Acad\Dwg\500R0, 11/9/2007 4:38:52 PM PRINTED: 3/31/2008 8:39:48 AM, Layout1, rjohnson

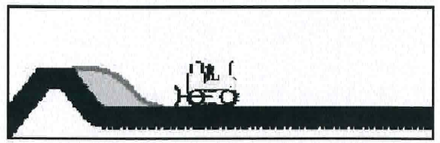
1. Build berm, 2 m high. Dump garbage near the berm.



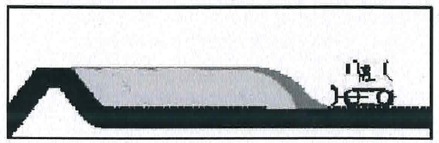
2. Drive over the garbage 3 to 5 times. Work the garbage up the berm a little at a time to pack it. Do this once per week.



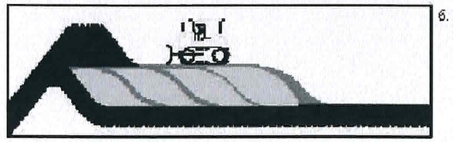
3. Alternate between dumping and packing garbage until packed garbage is 2 m high.



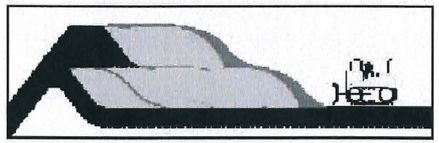
4. In spring or fall, or when garbage is 3 m wide, cover garbage with 0.3 m of granular material to make a cell.



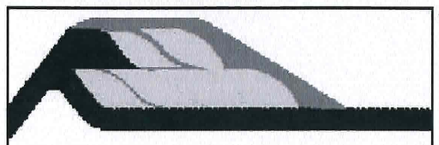
5. Repeat steps 1 to 4 until site is full. Then cover all garbage with 0.3 m of granular material. Pack and add more granular material until top is level.



6. Build new 2 m berm on top of cells.



7. Repeat steps 1 to 5.



8. To close out site, put 0.6 m of granular material on cells then pack with bulldozer so that water runs off.

AREA METHOD FOR WASTE DISPOSAL WITH A SECOND LAYER
N.T.S

NOTES:

1. *Information taken from "Guidelines for the Planning, Design, Operations and Maintenance of Modified Landfill Sites in the NWT" (Ferguson, Simek Clark Engineers & Architects, 2003).*

DRG. NO.	DESCRIPTION
REFERENCE DRAWINGS	

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
REVISIONS						

REV.	DATE	DESCRIPTION	DESIGN	DRAWN	CHK'D	APP'D
0	13NOV07	ISSUED IN FINAL	DD	BSP		
REVISIONS						

Knight Piésold CONSULTING

Baffinland Iron Mines Corporation

MARY RIVER PROJECT

LANDFILL SITE SEQUENCE OF ACTIVITIES FOR OPERATIONS AND CLOSURE

P/A NO.	DRG. NO.	REV.
NB102-00181/10	501	0

Knight Piésold
CONSULTING

APPENDIX A

MRL 004 DRILLHOLE LOG

- MRL Drillhole Log — 1 page
- (Previously issued with report Ref. No. NB102-00181/3-3, Rev. 0)

Project:	Mary River Project	Drill Hole No.	MRL 004	PAGE	1 of 1
Drilling Co:	Boart Longyear	In Situ Sampler:		Date Started:	17 Jun 06
Drilling Method:	Rotary Core - Longyear Fly 38	Elevation:	187.142 m	Date Completed:	17 Jun 06
Location:	Mary River, Baffin Island	Total Depth:	16.6 m	Logged by:	RLV
Coordinates:	7,912,576 N , 560,962 E	Inclination:	-90	Reviewed by:	KEH

DEPTH (m)	ELEVATION (m)	GRAPHIC LOG	DESCRIPTION OF MATERIALS	RUN RECOVERY (%)	FROZEN SOIL DESCRIPTION	SAMPLE RECOVERY (%)	SAMPLES	SAMPLE NO.	BLOW COUNT/ RQD (%)	SPT 'N' VALUE/ RMR	FIELD VANE SHEAR STRENGTH (Remould (▲) Peak (△)) / SPT TEST DATA 'N' VALUES (Uncorrected (×) Corrected (□)) PL MC LL 20 40 60 80	INSTRUMENTATION DEPTHS (m)	INSTRUMENTATION DETAILS
0	186.0		**1 - ORGANICS** (0 to 1) Nearby excavation indicated at least 1m of organics and dark grey silty fine grained sand. Poor recovery of this material due to washing of material by drilling fluid.					2					
2			**2 - TILL** (1 to 2) Light brown to grey, fine grained sand and silt. Low recovery of fines due to thawing and washing of soil by drilling fluid.	41	Vx Vc Vs ICE								
	184.0		**4 - SANDSTONE BEDROCK** (2 to 16.6) Light brown to grey, poorly consolidated, weak sandstone. Highly fractured with rubblized infill zones throughout. Frozen soils consist of ice inclusions and coatings within the rubble zones and 1mm to 1cm ice infilled fractures and joints throughout. Total visible ice was less the 5 percent.					1					
4													
	182.0												
6			Sample 1 (3.3m to 3.5m) - Well graded sand and gravel with some silt. Material consists of joint infill.	100	Vx Vc Vs								
	180.0		One 10cm ice lense encoutered at 7.2m depth.										
8													
	178.0			100	Vx Vc Vs ICE								
10													
	176.0												
12				100	Vx Vc Vs								
	174.0												
14			More competant sandstone starting at approximately 14m depth										
	172.0			100	Vx Vc Vs			3					
16													
			End of Drillhole: 16.6 m										

FROZEN SOIL DESCRIPTIONS:

Nf - POORLY BONDED
Nbn - WELL BONDED, NO EXCESS ICE
Nbe - WELL BONDED, EXCESS ICE
Vx - INDIVIDUAL ICE INCLUSIONS
Vc - ICE COATINGS ON PARTICLES
Vr - RANDOM OR IRREGULARLY ORIENTED ICE FORMATIONS
Vs - STRATIFIED OR DISTINCTLY ORIENTED ICE FORMATIONS
I+C - ICE WITH SOIL INCLUSIONS
ICE - ICE WITHOUT SOIL INCLUSIONS

SAMPLE SYMBOL:

AUGER | SPLITSPOON | THERMISTOR | CORE | SHELBY TUBE

Baffinland
Mary River Project

Knight Piésold CONSULTING

Project No.	Ref. No.	Rev.
NB102-00181/3	3	0

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I:\102-00181-3\ASSIGNMENT\DATA\GINT\PROJECTS\MINE SITE RAIL LOOPS.GPJ

Knight Piésold
CONSULTING

APPENDIX B

▲R1

LANDFILL FACILITY INSPECTION FORM

- Landfill Facility Inspection Form 2 pages

Baffinland
Iron Mines Corporation

Landfill Facility Inspection Form

Date: _____
Inspector name: _____
Inspector's position: _____

Please review and complete the checklist as applicable.

Surface Water and Site Runoff

Please inspect within landfill area, around berms and follow drainage to observe the following:

	Yes	No
Any pooling of water present within landfill area or against berms?		
If so, where?		
Any leachate developing in and around landfill area?		
If so, where?		
Is site runoff draining properly around landfill and directed towards Sheardown Lake?		
If no, explain.		

Geotechnical Assessment

Please examine the integrity of the berms and floor of landfill area to observe the following:

	Yes	No
Any evidence of ground temperature warming? i.e. soil creep, subsidence, heaving, etc.		
If so, where?		
Any indication of berm settlement?		
If so, where?		

Waste Composition and Placement

Please inspect contents of landfill and areal placement to observe the following:

	Yes	No
Are there any hazardous wastes present or proposed for landfill?		
Where and of what material type?		
Any recyclable or salvageable material present?		
Where and of what material type?		
Any burnable wastes such as cardboard, paper, food wastes or light plastics present?		
Where and of what material type?		
Do the wastes appear to be compacted on a regular basis?		

Other

Please observe the following:

	Yes	No
Is the route to the landfill in suitable condition to provide truck access?		
If not, describe location and problem.		
Is open burning occurring or is there evidence of open burning?		
If so, list the applicable permit.		

Other comments:

Please note, any non-conformances with the landfill should be reported to the Site Manager(s) in writing, for action.

SITE (CIRCLE ONE): **LANDFILL**

Date: **Observers:**
Time start: **Time end:** **Duration:**

Estimated time since last turnover (circle one): **hours days weeks**

Attractants:	Attractant Levels (circle one):			
Food	None	1-5 pieces	6-10 pieces	>10 pieces
Food packaging	None	1-5 pieces	6-10 pieces	>10 pieces
Oil products and containers	None	1-5 pieces	6-10 pieces	>10 pieces
Oil contaminated waste	None	1-5 pieces	6-10 pieces	>10 pieces
Aerosol cans	None	1-5 pieces	6-10 pieces	>10 pieces
Batteries	None	1-5 pieces	6-10 pieces	>10 pieces
Other_____	None	1-5 pieces	6-10 pieces	>10 pieces
Other_____	None	1-5 pieces	6-10 pieces	>10 pieces

Wildlife Observations

Species	Number	Comments

Wildlife Sign (tracks, scats, or chews)

Species	Type of Sign	Number	Comments

Additional Comments