Baffinland Iron Mines Corporation

Q1 Quarry Management Plan

BAF-PH1-830-P16-0017

Rev 0

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TRACK CHANGES TABLE

A review and update of the Q1 Quarry Management Plan has been undertaken, the following revisions have been completed.

Index of Major Changes/Modifications in Revision 0, July 2017:

Item No.	Description of Change	Relevant Section
1	Updated Hatch document to reflect Baffinland document format, Early Revenue Phase operations and proposed quarry design.	Document wide.

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1 INTRODUCTION

1.1 Purpose and Scope

The Mary River Project requires aggregate to sustain current production levels (4.2Mt per annum). This document outlines the site description, operations and reclamation for the Milne Inlet Q1 Quarry (Q1 Quarry). This plan will be periodically revised to ensure the plan reflects current operations and the aggregate volumes to be extracted from the Q1 Quarry.

1.2 Regulatory Context

The guidelines provided by the Nunavut Impact Review Board (NIRB) and Indigenous and Northern Affairs Canada (INAC) with regards to a Quarrying Permit Application state:

1. A Quarry Operations Plan is required with (this) application and must be approved by a Land Use Inspector prior to approval and issuance of the quarry permit if:
2. The volume being applied for is greater than 1,000 m^3 and/or
3. The quarry site is being operated by multiple users

Q1 Quarry near Milne Port exceeds the volume threshold of 1,000 m^3, and therefore this plan is required. This plan should be used in conjunction with the Borrow Pit and Quarry Management Plan (BAF-PH1-830-P16-0004), and other plans referred to in this document. In the case of the Q1 Quarry, because the quarry is situated on Inuit Owned Lands, the Qikiqtani Inuit Association (QIA) is the regulatory body that approves the quarry operation. As such, revisions of this plan will be submitted to QIA for approval under the Quarry Concession Agreement that forms part of the Commercial Lease No. Q13C301 (Commercial Lease) agreed upon by the QIA and Baffinland Iron Mines Corporation (Baffinland).

1.3 Site Description

The following physical description and environmental setting are summaries from the Mary River Final Environmental Impact Statement (FEIS). For a more complete description, refer Baffinland Iron Mines Corporation, Final Environmental Impact Statement, 2012, Volumes 6, 7, and 8. Site Physical Description. The drainage plan, quarry permit limits and proposed quarry design for the Q1 Quarry are shown Appendix A. The basic quarry specifics are shown in Table 1-1 below:

TABLE 1-1: Q1 QUARRY SPECIFICATIONS

Requirement	Description
NTS Map Sheet (1:50,000)	37 H/16 Edition 1 ASE Series A 713
Corresponding Plan of Property Drawing	Refer to Appendix A for quarry location.
Canada Lands Survey	Conducted in February 2014 by Montieth and Sutherland and provided to QIA.
Topographic Survey Data	Conducted by Baffinland Operations. Provided upon request.
Quarry Vertices Coordinates (UTM)	504192E 7975079N (centre point) 503725E 7975078N (W extent) 504830E 7975176N (E extent) 504527E 7974191N (S extent) 503889E 7975727N (N extent)
Total Area of Quarry (ha)	89.47
Current Volume Removed	Approx. 500,000 banked cubic metres (BCM)
Total Volume to be Removed with Contingency	2,500,000 BCM
Total Area of Proposed Quarrying	Appendix A shows the quarry permit limits, current development and proposed quarry design boundaries. The total area of the proposed quarrying (existing and additional) and associated land disturbance is 20.1 hectares (201,000 m^2).
Topsoil / Overburden Storage Area	None is required as the site is primarily exposed rock
Access Roads/Trails	The historical Milne Inlet Tote Road (Km 1 – 2) currently cuts through the southwestern corner of quarry permit limits, adjacent to the area to be quarried. As part of quarry operation and development, temporary access roads will be constructed. Current access roads are presented in Appendix A.
Camp Locations	No camp will be built specifically for the quarry operation. Personnel will be housed at the existing Milne Port camps.

Topography varies considerably across the Project area. The dominant landforms in the Milne Inlet area are typically a result of glacial activity, marine and mechanical forms in various degrees. Glacial activity is not overly apparent on the immediate Milne Port site but is more pronounced in the higher elevations south of the site where the proposed quarry is located. The Milne Inlet area consists of a series of variably dipping, dissected terraces sloping towards the waters of Milne Inlet. The surficial deposits are marine and glacial marine sediments, ranging from coarse beach sediments (gravel and sand), to finer deltaic sediments (clay, silt, sand, and gravel), to even finer deep water periglacial silt veneers (silt, clay and fine sand). The soils in the area are often covered by a thin layer of organics at the ground surface. The soils were noted to typically be frozen below 2 m depth and locally can contain ice lenses.

The nearest receivers that are considered to be fish habitat, as measured along interpreted flow paths, are between 1.6 and 2.2 km (Northeast to Phillips Creek estuary and North to Milne Inlet) (refer to Appendix A). There are some small ephemeral channels discharging seasonally into several shallow ponds that are not fish habitat. The streams or oriented generally in a northwest direction from the planned quarry area.

1.3.1 Environmental Setting

The existing surficial deposits near the quarry site range from coarse beach sediments (gravel and sand) to clay, silt, sand and gravel to even finer silt veneers (silt, clay and fine sand). The soils in the area are often covered by a thin layer of organics at the ground surface, creating a productive growing zone of topsoil for local vegetation.

Vegetation within the Mary River Project area is described in the Vegetation Baseline Study Report in Volume 6 of the FEIS (Appendix 6C). A total of 155 vascular plant species were recorded through the total Project area, a vegetation classification system was developed and a species list was compiled. No plant species considered to be “rare” in Canada were found to occur in the survey locations. Vegetation is present in the area of the proposed quarry, and exists in small patches where organic soil deposits occur along the hill slopes, and within the depressions between hills.

The existing surficial deposits near the quarry site range from coarse beach sediments (gravel and sand) to clay, silt, sand and gravel to even finer silt veneers (silt, clay and fine sand). These soils in the area are often covered by a thin layer of organics at the ground surface, creating a productive growing zone of topsoil for local vegetation.

Several species of songbirds and shorebirds migrate to this area annually to breed, and were predominately found in the various types of lowland habitats (river deltas, coastal plains, tundra, and near wetlands) that offer an abundant source of insects and vegetation for foraging and nesting habitat. This type of habitat is absent within and near the proposed quarry site, but is relatively abundant to the north and northwest. It should be noted that the Peregrine Falcon habitat is abundant in the area south of Milne Port, although the area itself is rated as not suitable. No major sea bird colonies or nesting areas were identified in the coastal waters near the quarry site.

Terrestrial wildlife on North Baffin Island is described in the terrestrial wildlife baseline report (Volume 6: Terrestrial, Appendix 6F). Terrestrial wildlife includes caribou, wolves, foxes, arctic hares, ermine, and small mammals. Occurrence of most wildlife species on North Baffin Island is relatively sparse, and this is expected to be especially true at the quarry site given the type of terrain.

Marine mammals present in the area include polar bear, ringed seal, bearded seal, walrus, beluga whale, and narwhal. With the exception of the polar bear, the quarry site is displaced from shoreline habitat sufficiently to avoid being regarded as suitable habitat.

2 BAFFINLAND POLICIES

2.1 Health Safety and Environment (HSE) Policy

This Baffinland Iron Mines Corporation Policy on Health, Safety and Environment 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 goals.

We implement 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 Environmental 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.
- Reclamation of lands to a condition acceptable to stakeholders.

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

- As evidenced by our motto "Safety First, Always" and our actions Health and safety of personnel and protection of the environment are values not priorities.
- All injuries, occupational illnesses and environmental impacts can be prevented.
- Employee involvement and active contribution through courageous leadership is essential 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 health and safety of all people working at our operation and responsible management of the environment are core values to Baffinland. In ensuring our overall profitability and business success every Baffinland and business partner employee working at our work sites is required to adhere to this Policy.

Brian Penney
Chief Executive Officer
March 2016

2.2 Baffinland Sustainable Development Policy

At Baffinland Iron Mines Corporation (Baffinland), we are committed to conducting all aspects of our business in accordance with the principles of sustainable development & corporate responsibility and always with the needs of future generations in mind. Baffinland conducts its business in accordance with the Universal Declaration of Human Rights and ArcelorMittal's Human Rights Policy which applies to all employees and affiliates globally.

Everything we do is underpinned by our responsibility to protect the environment, to operate safely and fiscally responsibly and with utmost respect for the cultural values and legal rights of Inuit. We expect each and every employee, contractor, and visitor to demonstrate courageous leadership in personally committing to this policy through their actions. The Sustainable Development and Human Rights Policy is communicated to the public, all employees and contractors and it will be reviewed and revised as necessary on a regular basis. These four pillars form the foundation of our corporate responsibility strategy:

1. Health and Safety
2. Environment
3. Upholding Human Rights of Stakeholders
4. Transparent Governance

1.0 HEALTH AND SAFETY

- We strive to achieve the safest workplace for our employees and contractors; free from occupational injury and illness, where everyone goes home safe everyday of their working life. Why? Because our people are our greatest asset. Nothing is as important as their health and safety. Our motto is "Safety First, Always".
- 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, awareness and promoting active courageous leadership. We allow our employees and contractors the right to stop any work if and when they see something that is not safe.

2.0 ENVIRONMENT

- Baffinland employs a balance of the best scientific and traditional Inuit knowledge to safeguard the environment.
- Baffinland applies the principles of pollution prevention, waste reduction 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 more sustainable practices.
- Baffinland ensures that an effective closure strategy is in place at all stages of project development to ensure reclamation objectives are met.

3.0 UPHOLDING HUMAN RIGHTS OF STAKEHOLDERS

- We respect human rights, the dignity of others and the diversity in our workforce. Baffinland honours and respects the unique cultural values and traditions of Inuit.
- Baffinland does not tolerate discrimination against individuals on the basis of race, colour, gender, religion, political opinion, nationality or social origin, or harassment of individuals freely employed.
- Baffinland contributes to the social, cultural and economic development of sustainable communities in the North Baffin Region.
- 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.
- We expect our employees and contractors, as well as community members, to bring human rights concerns to our attention through our external grievance mechanism and internal human resources channels. Baffinland is committed to engaging with our communities of interest on our human rights impacts and to reporting on our performance.

4.0 TRANSPARENT GOVERNANCE

- Baffinland will take steps to understand, evaluate and manage risks on a continuing basis, including those that may impact the environment, employees, contractors, local communities, customers and shareholders.
- Baffinland endeavours to 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 safety, health, environmental, socio-economic commitments and set annual targets and objectives.
- Baffinland conducts all activities in compliance with the highest applicable legal & regulatory requirements and internal standards.
- We strive to employ our shareholder's capital effectively and efficiently and demonstrate honesty and integrity by applying the highest standards of ethical conduct.

5.0 FURTHER INFORMATION

Please refer to the following policies and documents for more information on Baffinland's commitment to operating in an environmentally and socially responsible manner:

Health, Safety and Environment Policy
Workplace Conduct Policy
Inuktitut in the Workplace Policy
Site Access Policy
Hunting and Fishing (Harvesting) Policy
Annual Report to Nunavut Impact Review Board
ArcelorMittal Canada Sustainability and Corporate Responsibility Report

If you have questions about Baffinland's commitment to upholding human rights, please direct them to contact@baffinland.com.

Brian Penney
Chief Executive Officer
March 2016

3 SITE SECURITY AND SAFETY

Copies of all safety and management documents will be made available to on site personnel. On site personnel involved with operations at the Q1 Quarry are required to take mandatory operational and safety training. The active supervisor, with support from the onsite Environment and Health & Safety departments, will ensure that quarry operations are consistent with other management plans, terms and conditions of the issued permits and safety procedures for the Project.

Security signage will be posted at the entrance to the quarry. The remoteness of the quarry and the onsite presence of operations personnel will make perimeter fencing unnecessary.

Blasting and processing operations will be suspended if incursions into the quarry occur, or if observations of wildlife in the immediate quarry area are made. Personnel working in the area will provide warnings if approach by any animals are noted. All employees working on the quarry operation will receive wildlife awareness training. Baffinland's Operations Blasting Procedure (BAF-PH1-340-PRO-0003) further describes safety protocols followed onsite.

4 QUARRY OPERATIONS

4.1 Development and Operation

The quarry is accessed by a section of the historical Milne Inlet Tote Road which runs adjacent to the southwest corner of the Q1 Quarry. Current operations transports the following equipment to and from the quarry, as required:

- Drilling equipment
- Rock hauling trucks
- Excavators
- Blasting equipment
- Portable crusher/screener units

4.2 Current Quarry Development and Proposed Design

Development of the Q1 Quarry began in 2013 near Milne Port to support the construction of the Mary River Project's Early Revenue Phase. Following the completion of construction in 2014, the quarry continues to be used to support current operations at Milne Port and the Tote Road.

To ensure operations at Milne Port and the Tote Road continue to have access to the required amount of aggregate to support production, an updated quarry design that allows for an additional 2,000,000 BCMs (approx. 2,500,000 BCMs total since quarry development began in 2013) to be removed, as shown in Figure 4-1, is proposed in this plan. The current quarry development and the limits of the proposed quarry design are within the Q1 Quarry permit limits and are presented in Appendix A.

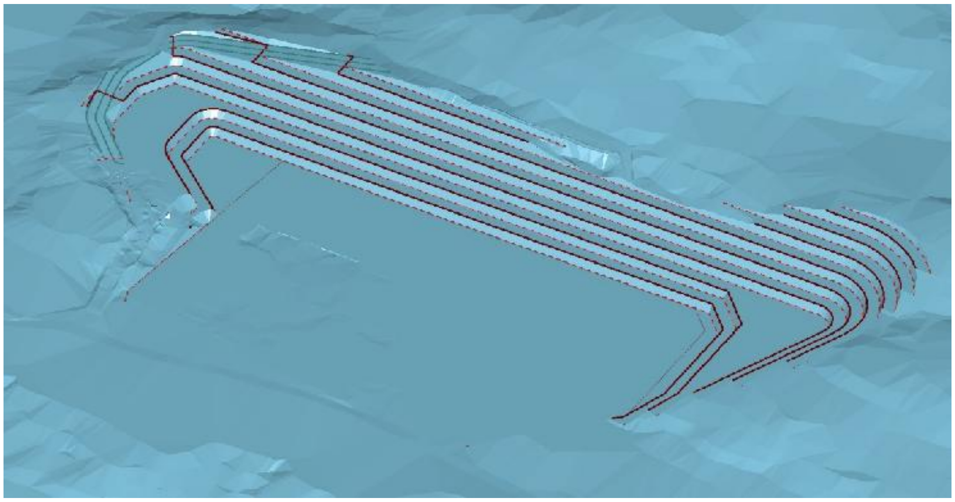


FIGURE 4-1– PROPOSED Q1 QUARRY DESIGN

4.3 Quarry Development

The following steps provide a general description of how Q1 Quarry was developed and provides details of the different activities associated with quarry development. Since there may be several faces where quarry mining is progressed at Q1, the following steps apply to each quarry face.

1. Access Road: Construct an access road with culvert water crossings and sediment and erosion controls from the crusher pad to the quarry face using fill material from a previously developed borrow/quarry site. This access road is used to transport the blasted quarry rock to a designated crusher pad.
2. Pioneer Bench and Loading Pad: Using a pioneer track drill, the first bench is drilled and blasted at some higher elevation so the bench bottom elevation is similar to the desired loading pad elevation. A portion of the initial blasted quarry rock will be utilized at the quarry face to create a level pad for loading quarry rock into haul trucks. After the loading pad is finished, blasted quarry rock is hauled to the crushing pad as crusher feed material to produce rock products.
3. Bench Drilling: As each drill round is blasted out, the drill either stays at this elevation to expand the bench in a longitudinal direction along the face, or the drill climbs up the quarry site to a higher elevation to drill and blast subsequent higher elevation benches. These benches are expanded in length as required for subsequent blasting of rock at that bench elevation. Benches are created for safety and for efficient drill/blast operations.
4. Subsequent Bench Development: Additional benches are created at higher elevations, starting at the open face of the site. Each bench proceeds toward the main body of rock at that elevation. Lower benches follow behind upper benches and drilled and blasted to move toward the main body of rock. Ramps may be constructed to the upper benches for truck loading near the blasted rock. Material is excavated from benches and loaded onto trucks for delivery to the crusher.
5. Drilling Quarry Rock: Drilling of the quarry rock is normally completed with the use of one drill rig. The boreholes are laid out by a surveyor to the engineered spacing and burden for each particular rock type, geology, and desired product size. The drill is removed from the area for loading explosives and blasting. The drill can proceed along the bench to continue drilling or proceed to a new bench.

6. Blasting Operations: Blasting rock is completed by installing high explosive detonating boosters with initiation wires, followed by dropping pre-packaged sticks of explosives, or pouring from pre-packaged bags, or by pumping bulk explosives (i.e. emulsion) from an explosives truck into the boreholes. Detonation and initiation is carried out with the use of delays to time the detonators in a very fast millisecond sequence of smaller blasts for efficient rock breakage. Blasting lags behind the drill as more drilling is completed. As each new drill round is completed, the drill moves on and the drilled round is loaded with explosives and blasted.
7. Hauling Quarry Rock: The blasted rock is loaded onto trucks for delivery to the crusher.
8. Crushing Operations: Quarry rock is fed to the crusher and screening equipment to size and produce the desired rock product, stored in stockpiles and loaded into trucks for delivery to construction sites.

4.4 Quarry Activities

4.4.1 Explosives Management and Blasting

A Blasting Management Framework has been developed and is presented in Annex 3 of the Borrow Pit and Quarry Management Plan. The framework focuses on the control and mitigation of key potential risks arising from the management and use of ammonium nitrate explosives at Project quarries.

The blasting operations will be carried out by Operations and/or an experienced contractor(s). Quarry operations will be using a combination of Ammonium Nitrate Emulsion (ANE), manufactured onsite at the Mary River Mine Site Emulsion Plant, and pre-packaged explosives. Transportation of ANE and pre-packaged explosives to and from the quarry site will occur from the magazine storage area(s) and the Mary River Mine Site Emulsion Plant via Project roadways.

Blast hole drilling will take place on an appropriate grid pattern, determined by field testing, in an effort to optimize blast rock size and blasting efficiency. Blasting will normally take place at the beginning and end of each shift on a seven days per week basis. The management of explosives for the Q1 Quarry will be consistent with the Project's Explosives Management Plan developed by Dyno Nobel (Dyno Nobel, 2013).

4.4.2 Excavation and Crushing

The entire operation takes place in an area of permafrost, and groundwater is therefore not an issue. Drilling will be monitored to avoid creating run off and drainage issues. Washing of aggregate is not required.

Some minor organic surface soils are present in the quarry area. If these overburden soils cannot be avoided, then they will be stripped and stored separately at the storage area for later re-use. Quarrying will work along the exposed rock faces and will be terraced to minimize run off from the site. Efforts will be made during blasting operations to avoid creating depressions which might collect run off or melt waters. Drilling and extraction exercises may occur concurrently, depending on issues of safety and schedule. Blasted rock will be cleared by loader and/or scraper and put into rock trucks for transport to the crusher/screener units. Loaders will feed rock to the crushing and screening operation.

Crushing and stockpiling areas will be located as near as practical to the southern extent of the quarry within easy access to the road location. Topsoil is present at the site, and will be retained in the stockpiling area for later re-use.

Crushing operations and screening operations will take place as required, occurring during night and day shift, seven days per week, if necessary. Crushing operations will process rock from the quarry, and may also process rock from other areas if required. Final material will be cleaned and stored by aggregate size in stockpiles for transport to the appropriate locations.

4.5 Site Management Measures

Best management practices for quarry operations will be followed for the Q1 Quarry. The following management activities are incorporated into the site operations:

4.5.1 Pre-Development Assessment for Metal Leaching and Acid Rock Drainage (ML/ARD)

The Milne Inlet Q1 Quarry was initially assessed prior to development utilizing the Protocol for the Assessment for the Potential for Acid Rock Drainage (Borrow Pit and Quarry Management Plan, Annex 2). AMEC was retained in the summer and fall of 2010 to undertake an assessment of proposed quarries to assess metal leaching and acid rock drainage (ML/ARD). One of the quarries assessed was the Q1 Quarry. The AMEC report presenting these results is provided in Appendix B. Industry standard methods have confirmed that aggregate materials used have a low potential for ARD/ML.

Field observations and sampling from quarry operations to date continue to confirm the low potential for ARD/ML at the Q1 Quarry. Operational sampling results for the Q1 Quarry are provided to QIA annually in the Annual Report, required by the Commercial Lease.

4.5.1.1 Review of Geological Information and Site Reconnaissance

Prior to quarry development, a review was conducted of existing site information and a visual inspection of surface portions of the proposed quarry development area was undertaken by means of a walk around. The review indicated that the quarry and surrounding areas are underlain by Archean age Precambrian rocks consisting of migmatitic gneisses. The gneisses are heterogeneous commonly with inclusions and bands of mafic, metasedimentary and other granitic rocks. Visual observations of the quarry development area indicated that outcrop exposure was excellent with little soil covering. Trace to no sulphides was observed during the site visit and there were no surface areas of visible sulphide oxidation.

4.5.1.2 Sampling

Prior to quarry development, one borehole (BH10-04) was advanced to a depth of 15 metres. Refer to Appendix A for the borehole location. Three representative samples of the rock core were sent for laboratory analyses. The intervals for rock sample selection were based on review of available drill logs and photographs. The strategy for sample selection and collection was based upon guidance found in MEND 2009 (Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials). Visual inspection of the core from BH10-04 indicated only the rare presence of sulphide minerals, primarily on fracture surfaces.

4.5.1.3 Analytical Testing Methods

Analytical tests included the following:

- Acid base accounting (ABA) including paste pH, modified Sobek neutralization potential (NP), total sulphur, sulphate sulphur, sulphide sulphur by difference, total carbon (TC) and total inorganic carbon (TIC)
- Total metals analysis
- Leachable metals by shake flask extraction (SFE)
- Mineralogy by X-ray diffraction (XRD) with Rietfeld refinement.

4.5.1.4 Results

The results of the above analyses for BH10-04 indicate that the bedrock gneiss underlying the Milne Inlet (Q1) quarry development area exhibit the following characteristics:

- Paste pH is weakly alkaline (9.56 to 9.92).
- Sulphide content was less than 0.01% for all samples.
- All samples had neutralization potential ratios (NPR) well in excess of 2. These materials are considered non potentially acid generating.
- Neutralization potential (NP) values were low and ranged from 7.9 to 8.8.
- In a comparison of total metal results of samples to crustal abundances, no notable elevation of metals were noted.
- There were no concerns regarding the results of the SFE tests.
- The Rietveld XRD analyses indicated no acid producing sulphide minerals identified, showing consistency with the low Acid Potential (AP) of all the samples analyzed. Calcite was identified in the sample.

4.5.1.5 Key Conclusions and Recommendations from Pre-Development ML/ARD Assessment

- Based on the results of geochemical and mineralogical analyses and general surface and subsurface geological observations there is a low potential for ML/ARD and the materials are therefore expected to be a suitable quarry source.

- Based on the work to date, both locally and regionally, in other areas of gneiss that have been investigated along the Tote Road, there is no evidence of elevated sulphide. Regardless, the relatively low NP in the material sampled suggests that the presence of low sulphide could potentially result in ML/ARD conditions.

Based on the conclusions, above, an operational testing program is recommended during the quarry extraction process. It is recommended that to start, approximately one composite sample of quarry material representative of a blast (muck sample or blast hole cuttings) be collected per 10,000 m^3 of material quarried. The analytical methods to be adopted will be as for the predictive sampling (MEND, 2009) or a defined alternative that has been shown to be predictive of ARD/ML. The sampling frequency should be adjusted to account for ongoing results. The quarried material can also be visually inspected for the presence of sulphides.

4.5.1.6 Future Reporting

Operational testing results will continue to be included in the Annual Report prepared for the QIA as required by the Commercial Lease.

4.5.2 Blasting Operational Management

A Blasting Management Framework has been developed and is presented in Annex 3 of the Borrow Pit and Quarry Management Plan. The framework focuses on the control and mitigation of key potential risks arising from the management and use of ammonium nitrate explosives at Project quarries.

In addition, blasting operations at the Q1 Quarry will adhere to the protocols outlined in Baffinland's Operations Blasting Procedure (BAF-PH1-340-PRO-0003).

4.5.3 Drainage Management

The potential exists to alter drainage patterns of overland flow paths and to cause minor affects to local water quality. The hydrological regime around the quarry site has been defined, and the appropriate direction of flows from site will be managed to maintain the natural flow patterns as much as possible. Poorly developed overland flow paths that intersect with the quarry development area will be modified as required to accommodate flows around the quarry development. This can be accomplished by means of diversion berms or excavation of shallow ditches. The quarry is currently designed to avoid fish bearing streams. The nearest downstream fish bearing fish bearing receiver is over one kilometre as measured along the interpreted flow paths. A drainage plan showing interpreted flow paths and downstream receivers for the Q1 Quarry is presented in Appendix A.

Sources of contamination from the operation that could affect water quality include dust from blasting and refuelling of equipment. Blasting residue from explosives will be managed by following best practices to ensure that all material is fully consumed during the blasting process. Vehicle re-fuelling will be conducted at a centralized fuelling facility off site that has proper containment and spill response capability. Refuelling of stationary onsite equipment, such as generators, will take place in a secured area with approved spill containment.

4.5.4 Ground Ice and Permafrost Management

Current development of the Q1 Quarry has uncovered no significant amounts of permafrost (frozen unconsolidated rock) and/or ground ice. Due to this and the limited amount of data available, the depth of the permafrost active layer in unconsolidated rock near the Q1 Quarry is assumed to be consistent with the Project area's typical depth of 1 to 2 metres.

In the event that significant sections of permafrost and/or ground ice are uncovered during quarry development, a specific action plan will be developed and submitted for approval to the relevant agencies prior to executing the mitigation measures outlined in the action plan. In general, mitigation measures to prevent degradation of uncovered permafrost and/or ground ice will consist of removing any ponding water and backfilling the impacted permafrost and/or ground ice with available material to reinstate the original topography.

Until the uncovered permafrost and/or ground ice can be addressed, the condition of the uncovered permafrost and/or ground ice will be periodically monitored by Operations personnel and inspected twice a year during the summer months by a Geotechnical Engineer as part of the biannual Geotechnical Inspections required by Baffinland's Type "A" Water Licence (2AM-MRY1325 – Amend. 1). The condition of the permafrost and/or ground ice at the quarry will be included in the biannual Geotechnical Inspection Reports and provided to the Nunavut Water Board and QIA as required.

4.5.5 Dust Management

The primary sources of dust associated with activities at the Q1 Quarry are blasting, loading and crushing and screening of aggregates. Very little topsoil exists at the quarry site, and is not considered a primary source of dust. The management of dust will be accomplished by minimizing the creation of dust at source. Crushing activity will take place as far from surface water or dust sensitive areas as is practical at the site. If possible, protection from prevailing winds will be accomplished by situating the crushing operation to take advantage of the local topography for shelter. Transport of material will be subject to speed limit restrictions to help reduce dust.

Dust management activities will include dustfall monitoring. Dustfall monitoring for the Q1 Quarry will consist of monitoring the snow near the quarry for deposits of quarry dust by means of visual observations in concert with the Project's Dustfall Monitoring Program, developed to quantify the extent and magnitude of dust fall generated by Project activities. If significant dust deposits are observed, an action plan will be developed to mitigate potential risks to receiving water bodies. The Project's current Dustfall Monitoring Program is presented in Baffinland's Terrestrial Environment Mitigation and Monitoring Plan (BAF-PH1-830-P16-0027) and includes several monitoring locations at and around Milne Port.

4.5.6 Noise Management

Quarry activities will generate noise from equipment operation, blasting and crushing and screening operations. Noise receptors within the area are restricted to wildlife and accommodation camps at Milne Port.

During quarry operations, wildlife monitors will inform management if significant wildlife activity, such as caribou movements, is occurring. Depending on the concentrations and likely effect of the noise generating activity, management may temporarily suspend operation of the quarry.

4.5.7 Chance Finds ("Carving Stone" Deposits and Cultural Heritage Sites)

The Mary River Project area has been occupied by humans for over 4,000 years. Archaeological sites are very common throughout the region, mostly consisting of stone structures that usually represent tent rings and shelters, caches, traps, hunting blinds, cairns and inukshuks. Therefore the potential exists to encounter undiscovered cultural heritage or archaeological resources (Chance Finds) during quarry development.

The quarry permitted limits, as shown in Appendix A, for the Q1 Quarry were fully assessed for cultural heritage and archaeological sites as well as "carving stone" deposits during 2007 and 2008. No sites or deposits were found in the permitted quarry limits during the assessment.

In the event that a cultural heritage or archeological site is discovered, the discovery will be managed as outlined in the Section 2.1 of Baffinland's Environmental Protection Plan (BAF-PH1-830-P16-008).

Similarly, discoveries of "carving stone" deposits, as defined in the Commercial Lease, will be reported to the onsite Environment Department and confirmed by the onsite Project geologist. If confirmed, Baffinland will notify the QIA and relevant agencies of the discovery and manage the deposit in accordance with Article 19 of the IIBA between the QIA and Baffinland.

4.6 Monitoring

Operation of the Q1 Quarry must be monitored to ensure compliance with the Borrow Pit and Quarry Management Plan and to meet the terms and conditions of the regulations and land-use permits granted for the Project. Current monitoring focuses on:

- Regular inspection of site-preparation measures
- Regular inspection of drainage from the quarry site
- Volume and quality estimates of the granular resource material produced
- Monitoring for permafrost and ground-ice presence
- Monitoring for presence of avian, terrestrial and marine mammals in the area
- Monitoring of water quality for changes
- Monitoring of snow surrounding quarries for dust deposition
- Any additional reporting requirements as outlined in any permits

Water quality monitoring stations established will be sampled and compared to the relevant discharge criteria in accordance with Baffinland's Type A Water Licence 2AM-MRY1325 (Type A Water Licence). The current water quality monitoring stations are provided below in Table 4-1. As the Q1 Quarry continues to be developed additional water quality monitoring locations will be established as required.

TABLE 4-1: Q1 QUARRY WATER QUALITY MONITORING LOCATIONS

Monitoring Location	UTM Coordinates (NAD83)		Latitude	Longitude	Flow Path No.[1]
	Easting (m)	Northing (m)			
MP-Q1-01	503,828	7,975,062	71° 52' 32" N	80° 53' 23" W	1
MP-Q1-02	503,811	7,975,272	71° 52' 39" N	80° 53' 25" W	2

[1] Drainage flow paths are identified on the Q1 Quarry Drainage Layout in Appendix A.

In the event that water quality at monitoring locations exceed the relevant discharge criteria, additional investigative water sampling will be conducted to identify the source of elevated water quality parameters and prescribe the appropriate corrective actions to ensure water quality meets the relevant discharge criteria outlined in the Type A Water Licence.

5 SUPPORTING MANAGEMENT PLANS

This plan should be viewed in concert with the following additional plans:

- Emergency Response Plan (BAF-PH1-830-P16-0007)
- Spill Contingency Plan (BAF-PH1-830-P16-0036)
- Surface Water and Aquatic Ecosystems Management Plan (BAF-PH1-830-P16-0026)
- Terrestrial Environment Mitigation and Monitoring Plan (BAF-PH1-830-P16-0027)
- Explosives Management Plan (Dyno Nobel, 2013)
- Waste Management Plan (BAF-PH1-830-P16-0028)
- Acid Rock Drainage Testing Protocol (refer to Borrow Pit and Quarry Management Plan, Annex C)
- Blasting Management Framework Protocol (refer to Borrow Pit and Quarry Management Plan, Annex B)
- Operations Blasting Procedure (BAF-PH1-340-PRO-0003)

6 CLOSURE AND RECLAMATION ACTIVITIES

The closure and reclamation of the Q1 Quarry and access roads have been integrated into the Projects Interim Closure and Reclamation Plan (BAF-PH1-830-P16-0012). Specific activities required for closure and reclamation of the Q1 Quarry are described in the subsections below. Closure of the active quarry face will involve removing all materials, equipment and infrastructure and reclaiming the site to a self-sustaining productive ecosystem.

6.1 Closure of Active Quarry Face

The active quarry face will be terraced during operation to closely manage issues related to drainage and will not be altered for closure. The quarry development will minimize the creation of pits and depressions to the degree practicable to reduce the potential for standing water. The quarry pit floor will be left as free draining.

6.2 Waste Disposal

All site waste will be collected and placed in appropriate containers for removal. Pre and post waste removal inspections will be made to ensure the thoroughness of the program. Waste will include metallic waste, construction material waste and domestic waste.

At the current time, no washroom facilities for personnel are expected at the quarry site. Any requirement for such facilities will be met by easily removable portable toilets. These will be operated in a manner consistent with regulations, and disposal will be in accordance with Baffinland's Waste Management Plan (BAF-PH1-830-P16-0028).

6.3 Stockpile Removal

Quarrying activities will be closely managed to avoid the accumulation of unnecessary stockpiles of aggregate. Any stockpiles that do remain will be dealt with as follows:

- Large rock will be spread out on the landscape or used as rip-rap for erosion control
- Medium sized rock will be used to re-contour affected areas to re-establish a more natural appearance to the area
- Small crushed rock will be used to assist in drainage restoration, and spread on the landscape to re-establish more natural contours
- Any collected soils will be spread to allow for the re-establishment of vegetation. No vegetation planting or seeding operations will take be undertaken to avoid introducing invasive species and natural re-vegetation will be allowed to take place

6.4 Road Reclamation

The Q1 Quarry access road(s) and the historical Milne Inlet Tote Road will be rehabilitated under Baffinland's Interim Closure and Reclamation Plan for the Mary River Project. Road bed will be removed as required to re-establish natural contours throughout the area.

6.5 Soil Remediation for Contaminated Soils

A pre-closure inspection of the entire quarry site will be made. Any contaminated soils, snow or ice packs, or overburden will be flagged. The extent of the contamination will be determined, and the material removed. Hydrocarbon contaminated soils or overburden will be transported to the Milne Port Landfarm Facility for bio treatment. Other contamination, such as heavy metals or toxins, will require containerization for shipment off site to an appropriate facility (refer to Interim Closure and Reclamation Plan)

6.6 Permafrost and Ground Ice

Reclamation of uncovered permafrost and ground/ice will involve removing any ponding water and backfilling the impacted permafrost and/or ground ice with available material as described in Section 6.3 of this plan.

7 ENVIRONMENTAL RESPONSIBILITIES

7.1 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 5-1 below. Communication channels are described as liaisons in the tables outlining the responsibilities and accountabilities in the following sections.

7.1.1 Environmental Project Team

7.1.1.1 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 5-1.

TABLE 7-1: BAFFINLAND IRON MINES CORPORATION SENIOR MANAGEMENT

Baffinland Senior Management	
Position	**Responsibilities and Accountabilities**
Chief Operating Officer	- 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	- Reports to Baffinland's CEO - Establish corporate environmental policies and objectives - Monitors and reports on Baffinland's performance related to environmental policies and objectives - Liaise with regulatory authorities - Obtains necessary permits and authorizations - Monitors compliance with terms and conditions of permits and licences
Chief Procurement Officer	- Reports to Baffinland's CEO - Accountable for procurement and purchasing - Ensure that environmental commitments, policies and objectives are included in all contract documents

Baffinland Senior Management	
Position	**Responsibilities and Accountabilities**
Director Inuit, Government and Stakeholder Relations	- Reports to VP Sustainable Development - 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
Director of Sustainable Development	- Reports directly to VP Sustainable Development and indirect reporting and coordination with Chief of Operations - Liaises with the senior management, regulators and stakeholders - Ensures effective monitoring and auditing of environmental performance of departments and contractors on site and identifies opportunities for improvement - Monitors compliance with permits, licenses and authorizations - Ensures all regulatory environmental monitoring and reporting requirements (monthly, annual) are met - Leads and coordinates site permitting requirements. - Initiates and oversees environmental studies

The Baffinland Environmental Team will oversee all environmental activities on site. These responsibilities on-site are outlined in 5-2.

TABLE 7-2: BAFFINLAND IRON MINES CORPORATION ON-SITE ENVIRONMENTAL TEAM

Baffinland Project Environmental Department (Onsite)	
Position	**Responsibilities and Accountabilities**
Environmental Superintendent	- Reports to Director of Sustainable Development and indirect reporting and coordination with Chief of Operations - Overall accountability for environmental staff and performance at site - Coordinates implementation and monitors the performance of the Environmental Management System at site - Serves as the liaison for regulators during onsite inspections and visits - Provides ongoing environmental education and environmental awareness training to all employees and contract workers - Oversees investigations and reporting of environmental incidents to regulatory bodies, stakeholders and senior management - Reviews updates for management plans
Environmental Coordinator	- Reports to the Environmental Superintendent - Specific accountabilities for environmental monitoring and reporting - Provides day to day direction to Environmental staff onsite - Serves as a liaison for regulators during onsite inspections and visits. - Provides ongoing environmental education and environmental awareness training to all employees and contract workers - Assists with environmental database management

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

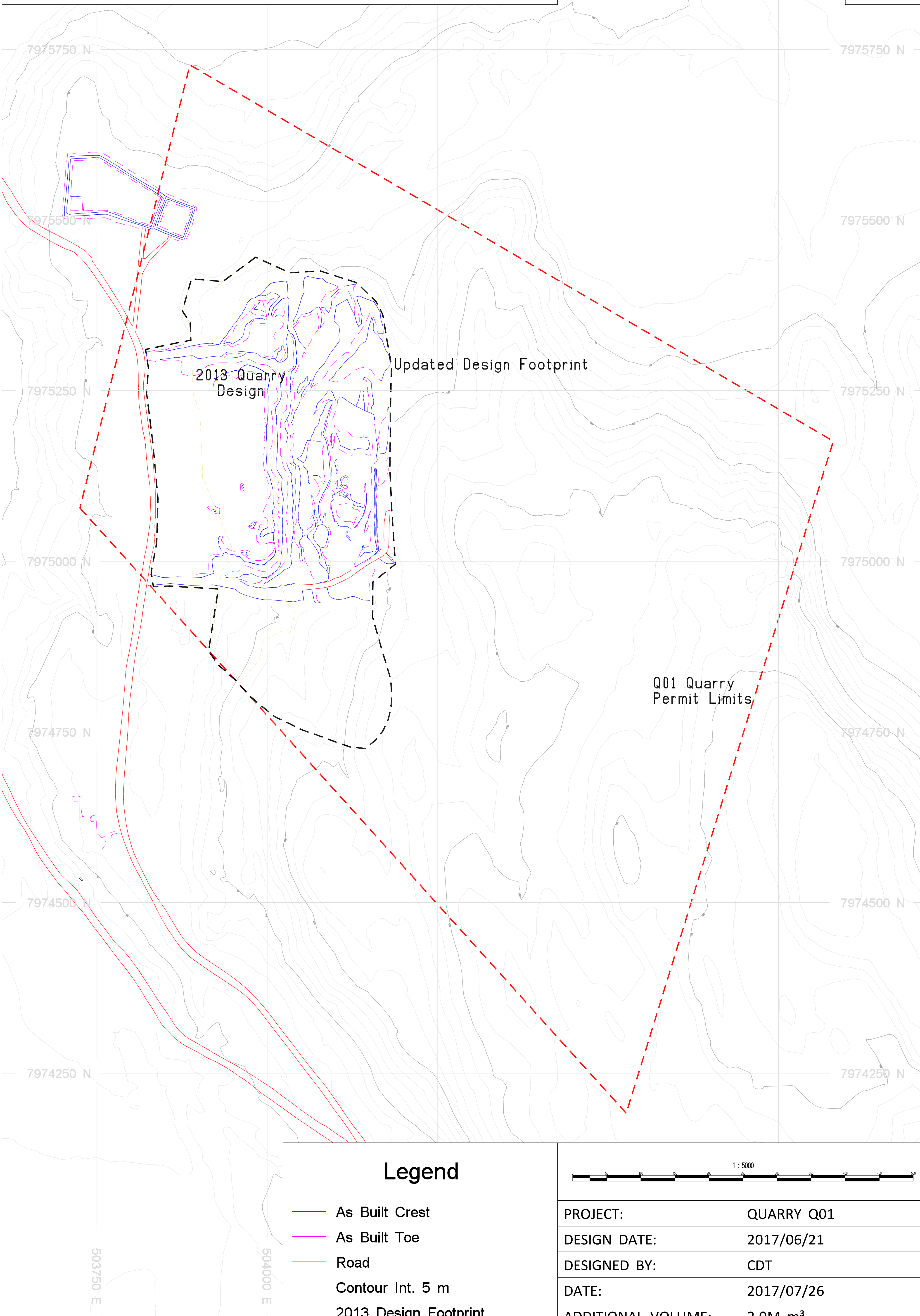
8 REFERENCES

Dyno Nobel. 2013. Baffinland Iron Mines: Mary River Project – Explosives Management Plan

APPENDIX A

Q1 Quarry Drainage Drawing and Updated Quarry Design

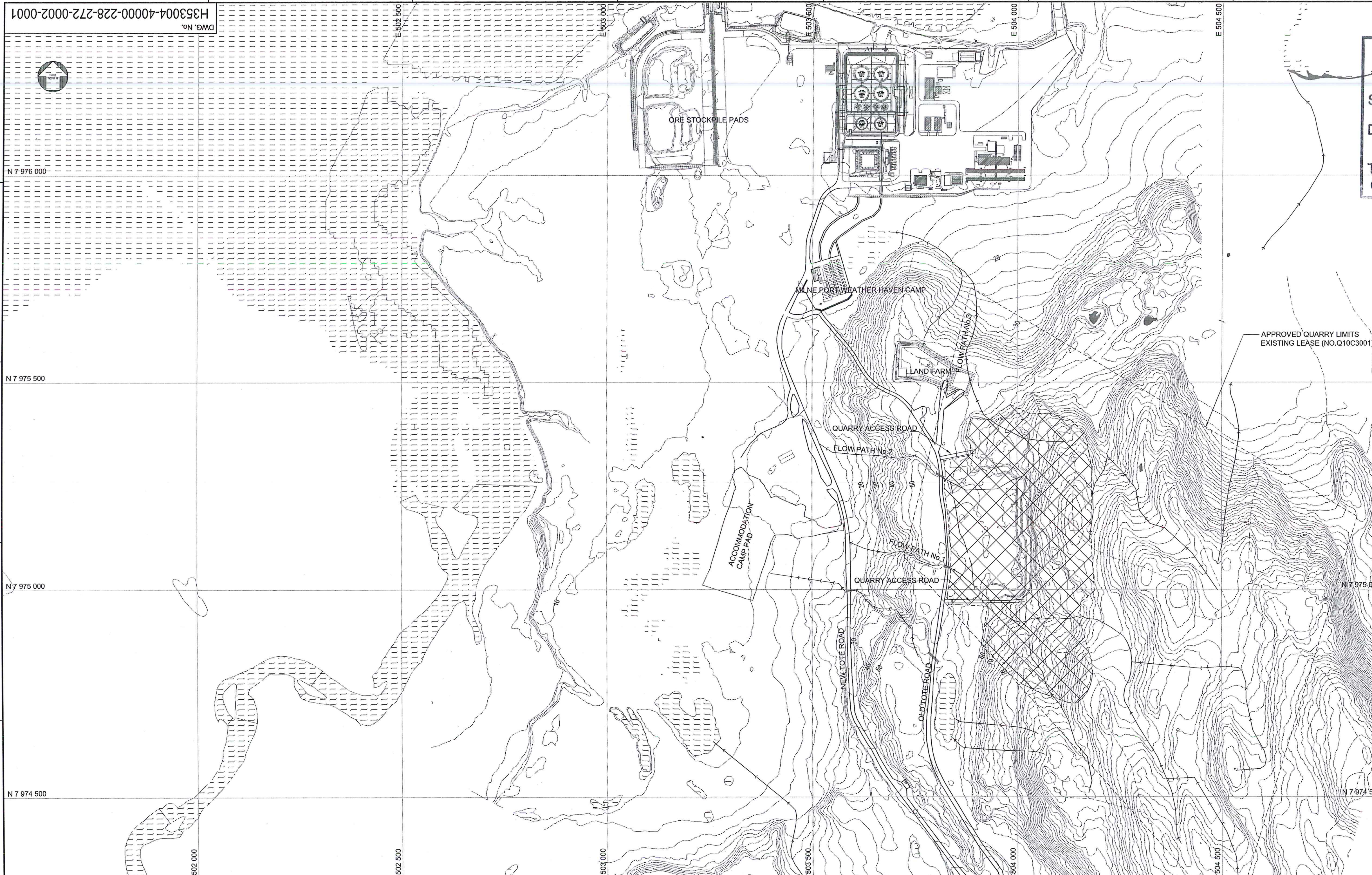
Baffinland



Legend

- As Built Crest
- As Built Toe
- Road
- Contour Int. 5 m
- 2013 Design Footprint

PROJECT:	QUARRY Q01
DESIGN DATE:	2017/06/21
DESIGNED BY:	CDT
DATE:	2017/07/26
ADDITIONAL VOLUME:	2.0M m^3



LAYOUT
SCALE 1:5000

PERMIT TO PRACTICE
HATCH LTD.
Signature (signed)
Date 28 July 2017
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
RAH
L1247
R. A. HALIM
LICENSEE
28/7/2017
NWT/NU

FOR USE

NOTES:

1. LIDAR SURVEY PROVIDED BY PHOTSAT (2016)
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. ALL DIMENSIONS ARE IN METERS.
4. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 2m.
5. FLOW PATH No. 1 DISTANCE FROM QUARRY TO RECEIVER No. 1 IS APPROXIMATELY 390m.
6. FLOW PATH NO. 2 DISTANCE FROM QUARRY TO RECEIVER NO. 2 IS APPROXIMATELY 410m.
7. FLOW PATH NO. 3 DISTANCE FROM QUARRY TO RECEIVER NO. 3 IS APPROXIMATELY 600m.
8. RECEIVER FOR FLOW PATHS 1 AND 2 IS ON THE MAIN DRAINAGE DITCH ALONG THE NEW TOTE ROAD. RECEIVER FOR FLOW PATH 3 IS THE LOW LYING AREA WEST OF THE NEW TOTE ROAD.

LEGEND:

- RIDGE LINE (HIGH POINT)
- STREAMS
- WATER BODY
- PROPOSED FOOTPRINT FOR QUARRY Q1
- LIDAR GROUND CONTOUR
- FLOW DIRECTION

0 50 100 150 200 250
SCALE IN METERS

DRAWING No.	DRAWING TITLE

REFERENCE DRAWINGS

R.HALIM
NAME
RAH
SIGNATURE
L1247
ENG REG NUMBER
28/07/2017
REVISION DATE
03/07/2017
ORIGINAL DATE
REG. PROFESSIONAL

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HATCH

No.	DESCRIPTION	BY	CHK'D	DATE
1	MODIFIED QUARRY FOOTPRINT ADDED	IHB	RG	28/07/2017
0	APPROVED FOR USE	FH	MB	04/07/2017

REVISIONS

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	F HUGO	NR	
DESIGNER	F HUGO	NR	
CHECKER	M BRONDANI	(signed)	28/07/2017
DESIGN COORD.	R GOOSEN	(signed)	28/07/2017
RESP. ENG.	R HALIM	RAH	28/07/2017
LEAD DISC. ENG.	A GROBBELAAR	(signed)	28/07/2017
AREA MANAGER	J HOWES	(signed)	28/07/2017
PROJ. MANAGER	S HEINER	(signed)	28/07/2017
CLIENT			

DRAWING APPROVAL STATUS: Approved for Use

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

MILNE PORT
QUARRY Q1 DRAINAGE
LAYOUT

SCALE 1:5,000 OR AS NOTED
DWG. No. H353004-40000-228-272-0002-0001
REV 1

SHEET SIZE: D

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APPENDIX B

AMEC - Tote Road Aggregate Sources Geochemistry Characterization Report

TECHNICAL MEMORANDUM

To	**Greg Wortman, AMEC** **Doron Golan, AMEC**	Project No. File No.	**TC101510** **017**
From	**Catherine Daniels, AMEC** **Steve Walker, AMEC**	cc	**Brian Lapos – AMEC** **Stephan Theben - AMEC** **Steve Sibbick – AMEC**
Tel	**905-568-2929 x 4104**		
Email	steve.walker@amec.com		
Date	**December 10, 2010**		

Subject **Baffinland Mary River Project – Trucking Feasibility Study**
Interim ML/ARD Assessment of Tote Road Quarry and Borrow Pit Samples
Rev1 – Issued for DEIS

1.0 INTRODUCTION

AMEC was retained by Baffinland Iron Mines Corporation (Baffinland) to conduct environmental studies in support of an environmental impact assessment (EIA). As part of the supporting environmental studies, AMEC assessed the metal leaching and acid rock drainage (ML/ARD) characteristics of rock samples to support future borrow pit and quarry development along the proposed Milne Inlet Tote Road alignment upgrade.

Drill core and unconsolidated surficial materials were collected from potential quarry and borrow pit locations along the Tote Road alignment during a geotechnical investigation aggregate sourcing program. AMEC submitted selected samples to SGS Mineral Services (SGS) of Lakefield for geochemical analyses on the potential quarry and borrow pit materials. This memo reports on a screening level ML/ARD assessment of these materials.

2.0 SITE DESCRIPTION

The Mary River Project is located in the northern region of Baffin Island in Nunavut territory, Canada. This area experiences a mean annual temperature of approximately -12°C and monthly averages below -20°C from December to March. Above freezing temperatures occur only from June to August, with an average high of 4.4°C in July.

The existing all-season Milne Inlet Tote Road (Tote Road) is currently undergoing design for the purpose of upgrades for the transportation of ore from the mine site to Milne Inlet. The road was originally established in the 1960's and runs approximately 107 km from the Mary River exploration camp to Milne Inlet.

The majority of the Tote Road alignment follows the valley of Phillips Creek which is bounded by steep ridges located on either side of the road corridor.

Regional geologic mapping is available for the entire route of the Tote Road (Scott and de Kemp, 1998). Approximately the first 20 km of the Tote Road from Milne Inlet passes through Precambrian terrane. The middle 73 km of the road travels across relatively flat lying Paleozoic rocks and the final 14 km of the road to the Mary River site again passes through Precambrian terrane near the boundary with the Paleozoic units.

Paleozoic rocks along the route include the Cambrian-Ordovician age Gallery and Turner Cliffs Formations, the Ordovician age Ship Point Formation, and the Ordovician Sillurian age Baillarge Formation. The Gallery Formation is ~340 m thick medium to coarse grained quartzose sandstone with minor siltstone, conglomerate and shale, and rare breccia, dolomitic sandstone and dolostone. The Turner Cliffs Formation is an approximately 310 m thick shaly to pure dolostone unit with intra-beds of dolomitic clastic sedimentary rocks. The Ship Point Formation is a 50 to 275 m thick finely crystalline dolostone that is commonly silty or sandy and interbedded with clastic dolomitic rocks. The formation is resistate and forms prominent cliffs in the area. The Baillarge Formation is an ~490 m thick unit of fine-grained limestones interbedded with minor dolostone, breccia, conglomerate, sandstone and cherty beds, and is often fossiliferous.

The Precambrian rocks are interpreted to be Archean age migmatitic gneisses in the region between Milne Inlet and the Paleozoic rocks and again between the Paleozoic sediments and the Mary River site. The migmatitic gneisses are heterogeneous commonly with inclusions and bands of mafic, metasedimentary and other granitic rocks. Archean Mary River Group rocks are present in close proximity to the migmatites along the route near the Mary River site. Mary River Group rocks consist mainly of siliciclastic sedimentary and mafic volcanic rocks. The Mary River Group hosts the Algoman-type iron formation deposits at the site.

3.0 METHODS

3.1 Sampling

During the autumn of 2010, AMEC conducted a geotechnical investigation of proposed quarry and borrow pit locations along the Tote Road alignment. The investigation included the collection of drill core from the quarry locations and the collection of unconsolidated material from borrow pit locations. .

3.2 Sample Selection for Testing

The objective in sample selection for ML/ARD characterization was to collect a set of samples for analysis which are representative of the geochemical variation of the different soil and rock types that will be used as quarry and borrow material for the Tote Road upgrade . Samples were selected from drill core and from the collected borrow pit material.

Intervals for rock sample selection were identified by AMEC after reviewing available drill logs, photographs and following direct inspection of the core. The strategy for sample selection and collection was based upon the guidance found within the document *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials* (MEND 2009). Borehole locations and observed rock types are tabulated below.

Regional Mapped Geology and Borehole Rock Type

Regional Mapped Geology*	Borehole Number	Approximate Tote Road Chainage	Rock Type
Archean Migmatitic Gneiss	BH-10-04	2+100	Granitic Gneiss
	BH-10-05	3+100	Granitic Gneiss
	BH-10-06	4+100	Granitic Gneiss
	BH-10-07	5+000	Granitic Gneiss
	BH-10-08	6+000	Granitic Gneiss
	BH-10-09	7+000	Granitic Gneiss
	BH-10-12	22+000	Granitic Gneiss
Cambrian-Ordovician Gallery or Turner Cliffs Formation	BH-10-13	39+100	Carbonate bound quartz sandstone with silty interlayers
	BH-10-14	45+200	Sandy carbonate
	BH-10-15	50+000	Carbonate with minor shale and mudstone
	BH-10-16	61+500	Carbonate
Archean Migmatitic Gneiss	BH-10-21	85+000	Schist with pegmatite veining

* Scott and de Kemp, 1998

The drill core and material from 14 of the 15 borrow pits were shipped from the site to AMEC offices in Hamilton Ontario where the samples were split for ML/ARD analyses and aggregate testing. For the purposes of ML/ARD characterization, three sections of 1 m lengths of drill core were selected from each of the 12 boreholes. The 1 m lengths of core were split in half with half retained and half submitted for geochemical analysis.

Borrow pit material was crushed and screened to <20 mm. The unconsolidated material from the borrow pits was then split such that approximately two kilograms of each sample was sent for geochemical analyses. The remainder of the borrow pit material and the remainder of quarry material will be used for aggregate source material testing presently underway.

The drill core samples selected represented 21 samples of gneiss and three samples of schist from the Precambrian units, and 12 samples of clastic and carbonate sedimentary rocks from the Paleozoic units. The borrow pit materials were typically sand or silty sand with varying quantities of gravel cobbles and boulders. Some had finer grained material as well as occasional small boulders. Cobbles and boulders in the samples generally consisted of carbonate or gneiss.

Visual inspection of the Precambrian core during the sample collection indicated the rare presence of sulphide minerals, primarily on fractured surfaces. No visible sulphide minerals were observed during inspection of the Paleozoic rock core samples at the time of sample selection. However, there was some iron staining noted in some samples.

3.3 Testing Methods

Split samples were shipped to SGS Lakefield for analysis. Testing methodologies followed those described in MEND (2009).

Analytical tests conducted included:

- Acid base accounting (ABA), including paste pH, modified Sobek neutralization potential (NP), total sulphur, sulphate sulphur, sulphide sulphur by difference, total carbon (TC) and total inorganic carbon (TIC);
- Total metals analysis by aqua regia digestion with ICP-MS finish;
- Leachable metals by shake flask extraction (SFE); and
- Mineralogy by X-ray diffraction (XRD) with Rietveld refinement.

Each sample was analysed for ABA and total metals. Testing by SFE and XRD were performed on a subset of samples, selected from the initial sample set. Considering project time-lines, the subset was selected prior to completion of the ABA and metals analyses. The subset was selected to best represent the entire sample set using the data available at the time.

4.0 GEOCHEMICAL TESTING RESULTS

4.1 Acid Base Accounting (ABA)

Results of ABA testing are summarized in Figures 1 and 2, with complete results presented in Table 1. A statistical summary of the results presented in Table 2. Results for rock samples are subdivided by lithology.

Figure 1 shows the relationship between modified Sobek NP and carbonate NP (CaNP) and indicates that carbonate minerals are the main source of NP in the sedimentary rocks and unconsolidated borrow pit materials. Non-carbonate minerals appear to be the primary source of NP for the schist and gneiss samples (Figure 1).

For the purposes of this screening level assessment, the calculated acid potential of the samples has been conservatively based on the total sulphur content, and is referred to as the maximum potential acidity (MPA) (Figure 2).

Overall findings of the results are summarized as follows:

- Paste pH of all samples were weakly alkaline. Carbonate rocks had a median paste pH of 8.3), whereas the schist and gneiss samples had the higher paste pH with a median of 9.8). Borrow pit materials reported a median paste pH of 8.9.
- Sulphide content of all samples was very low with the maximum concentrations ranging from 0.04% in carbonate sedimentary rocks to 0.02% in schist and 0.01% in gneiss and unconsolidated borrow pit materials.
- All samples had neutralization potential ratios (NPR) well in excess of 2 based on the more conservative MPA (Figure 2). These materials are considered non potentially acid generating (non-PAG).
- Gneiss and schist samples exhibited low NP values (median 8 and 10 kg $CaCO_3$/t respectively).
- Carbonate rich sedimentary rocks exhibited high NP (median carbonate NP of 890 kg $CaCO_3$/t).
- Unconsolidated materials had a generally high NP with most samples reporting >100 kg $CaCO_3$/t (median CaNP of 218 kg $CaCO_3$/t). However, the lowest NP of the sample set (5 kg $CaCO_3$/t) was from an unconsolidated borrow pit sample.

4.2 Metals Analyses

4.2.1 Total Metals

In order to identify metals of potential environmental significance, total metals results were compared to average continental crustal abundances (Price 1997). For screening purposes the concentration of an element was considered enriched if concentrations were greater than ten times the average crustal abundance. Metal results are presented in Table 3 and a statistical summary is provided in Table 4. It should be noted that the total concentration of an element does not determine the metal leaching potential of that element.

In general, the quarry and borrow pit samples demonstrated no notable elevation of elements relative to the average composition of the continental crust. However, the MDL values for bismuth and selenium were greater than ten times the average continental crust values. Therefore, any detectable values for bismuth or selenium were above ten times the average continental concentration.

4.2.2 Shake Flask Extraction Test

Eleven samples representing the three different rock types and four samples of unconsolidated borrow material underwent Shake Flask Extraction (SFE) testing. The SFE testing (Table 5) were compared to Metal Mining Effluent Regulation values (MMER, 2002). More stringent guideline values are also provided for reference purposes only. Guidelines for the protection of aquatic life and the drinking water guidelines (CWQG-PAL and CDWG guidelines in Table 5), which are focused on the preservation of water quality in the receiving waterbody for specific receptors (i.e., aquatic life, drinking water) are conservative since these values represent concentrations at point of use or exposure, not point of discharge. These guidelines are useful to identify parameters of interest when evaluating final discharge to receiving waters.

Results of SFE analyses (Table 5) for all samples, had a final pH that was neutral to alkaline with generally low concentrations of metals and no exceedances of MMER limits. The pH in SFE leachates for a number of these samples exceeded the MMER limit of 9.5. This is not unexpected for freshly exposed rock materials under agitation and at the high solid-solution ratios of the test. The high pH (and corresponding elevated aluminum concentrations) were likely related to the weak alkalinity associated with aluminosilicate mineral dissolution. It is unlikely the elevated pH (and associated aluminum) will be observed under field conditions. A single borrow material sample had an elevated copper concentration in comparison to the rest of the sample set. However, the concentration was an order of magnitude lower than the MMER limit.

4.3 Mineralogy

Rietveld XRD analysis was completed on 15 selected quarry and unconsolidated borrow pit samples. Results are presented in Table 6. The Rietveld method is effective at identifying crystalline phases present in abundance greater than a few weight percent. Lower abundances can be quantified where favourable scattering properties exist.

There were no acid producing sulphide minerals identified by XRD in the quarry or borrow pit samples, which is consistent with the low AP of all samples analysed. There were carbonate minerals identified in most of the samples.

Calcite was identified at low weight percent to trace values (<1.2%) in all but one of the granitic gneiss samples. Trace amounts of dolomite and rhodocrosite were also identified in a single granitic gneiss sample along with similarly low calcite. No carbonates were identified in one granitic gneiss sample and the single schist sample analysed.

Calcite was the dominant mineral (>98 wt.%) identified in the three carbonate samples. Trace dolomite and ankerite were also identified in these samples. In the carbonate cemented sandstone, dolomite (approximately 26%) was the only carbonate mineral identified.

Calcite, dolomite and ankerite were identified in most of the borrow material samples. Rhodocrosite was also identified in one sample. In the fourth sample the only carbonate mineral identified was calcite at very low weight percent (0.2%).

Calcite and dolomite have effective acid neutralizing properties, while the neutralizing ability of iron and manganese bearing carbonate minerals such as ankerite and rhodocrosite is uncertain. Dissolution rates of these minerals may be slower and under oxidizing conditions, hydrolysis of the iron and manganese released leads to no net neutralization. However, for this sample set the iron and manganese carbonates, when present, are always in low abundance compared to calcite and dolomite. Therefore, the presence of these minerals in this case will have only a minor influence on the neutralization potential of the materials.

5.0 CONCLUSIONS

Lithologically-based ML/ARD assessments have been completed on selected quarry and borrow materials along the Tote Road. Based on the results of this assessment, the following conclusions are made:

- The materials investigated in the proposed quarries and borrow pits along the Tote Road route appear to have a low potential for ML/ARD and are expected to be suitable as quarry or borrow sources. However, individual quarry and borrow sites should be subjected to additional site specific ML/ARD characterization with consideration given for additional assessment depending upon the tonnages to be used and anticipated geological variability.

- The relatively low NP in the Precambrian rocks suggests that the presence of low contents of sulphide could potentially result in ML/ARD conditions. Diligence through adequate levels of sampling and monitoring during extraction operations will be necessary to ensure that the low concentrations of sulphide observed in this study are confirmed elsewhere.
- Paleozoic sedimentary rocks selected as potential quarry sources in this study are all carbonate rich and pose no ML/ARD risk. However, other non-carbonate sedimentary rocks are present in the region, so caution should be exercised should other quarry locations in the Paleozoic region be selected.
- Rietveld XRD results are consistent with ABA data for the rock-types analysed. Calcite or dolomite is confirmed to be in abundance in all carbonate rich samples and low to trace carbonate minerals are present in the granitic gneiss samples. For the gneiss samples neutralization from silicate minerals present in greater abundance than the carbonates is inferred.
- Borrow materials tested have high NPR values and pose no apparent ML/ARD risk.
- Carbonate as calcite and dolomite appear to be common components in most borrow materials tested; however, one sample was identified that was carbonate poor and quartz rich, thus having very low NP and suggesting not all borrow sources will have high carbonate NP.
- Ankerite and rhodocrosite were sometimes identified in carbonate-bearing samples, suggesting a portion of the carbonate content may not contribute to neutralization under oxidizing conditions. However, these carbonate forms were always subordinate to calcite or dolomite.

6.0 FUTURE WORK

The following work is planned and proposed.

- Continued collection and analysis of material from any future drilling or excavation programs along the Tote Road alignment to the extent necessary to minimize risk of ML/ARD.

7.0 REFERENCES

Canadian Council of Ministers of the Environment. 2007, Canadian Water Quality Guidelines for the Protection of Aquatic Life.

Health Canada. 2008, Guidelines for Canadian Drinking Water Quality.

MMER. 2002. Metal Mine Effluent Regulations SOR/2002-222.

MEND 2009, Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. Natural Resources Canada.

Price, W.A., 1997. Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia.

Scott, D.J. and de Kemp, E.A. Bedrock geology compilation, northern Baffin Island and northern Melville Peninsula, North West Territories; Geological Survey of Canada, Open File, 3633, scale 1:500,000.

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Attachments:
Table 1 — Acid Base Accounting Results
Table 2 — Acid Base Accounting Statistics
Table 3 — Total Metals Results
Table 4 — Total Metals Statistics
Table 5 — Shake Flask Analysis Results
Table 6 — Rietveld Quantitative Analysis X-ray Diffraction Results
Figure 1 — ABA Results - CaNP vs. NP
Figure 2 — ABA Results – NP vs. MPA

TABLES

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Table 1 Acid Base Accounting Results

Sample ID	Drill Log Lithology	Sample weight(g)	HCl added mL	HCl Normality	NaOH Normality	NaOH to pH=8.3 mL	Final pH units	Fizz Rate ---	Paste pH units
10-TR-001 BH10-04	gneiss	2.05	20.00	0.10	0.10	16.77	1.36	1	9.56
10-TR-002 BH10-04	gneiss	2.01	20.00	0.10	0.10	16.75	1.39	1	9.92
10-TR-003 BH10-04	gneiss	1.98	20.00	0.10	0.10	16.50	1.39	1	9.58
10-TR-004 BH10-05	gneiss	2.03	20.00	0.10	0.10	17.00	1.40	1	9.79
10-TR-005 BH10-05	gneiss	1.97	20.00	0.10	0.10	17.41	1.38	1	9.76
10-TR-006 BH10-05	gneiss	2.03	20.00	0.10	0.10	17.48	1.38	1	9.73
10-TR-007 BH10-06	gneiss	1.98	20.00	0.10	0.10	17.03	1.39	1	9.78
10-TR-008 BH10-06	gneiss	2.01	20.00	0.10	0.10	17.05	1.42	1	9.65
10-TR-009 BH10-06	gneiss	1.98	20.00	0.10	0.10	16.95	1.41	1	9.90
10-TR-010 BH10-07	gneiss	2.00	20.00	0.10	0.10	16.18	1.46	1	9.98
10-TR-011 BH10-07	gneiss	1.98	20.00	0.10	0.10	15.37	1.50	1	9.66
10-TR-012 BH10-07	gneiss	1.96	20.00	0.10	0.10	15.48	1.43	1	9.90
10-TR-013 BH10-08	gneiss	2.00	20.00	0.10	0.10	17.47	1.38	1	9.68
10-TR-014 BH10-08	gneiss	2.04	20.00	0.10	0.10	16.10	1.44	1	9.46
10-TR-015 BH10-08	gneiss	2.04	20.00	0.10	0.10	15.75	1.46	1	9.52
10-TR-016 BH10-09	gneiss	1.98	20.00	0.10	0.10	17.53	1.40	1	10.00
10-TR-017 BH10-09	gneiss	2.04	20.00	0.10	0.10	17.10	1.41	1	9.91
10-TR-018 BH10-09	gneiss	1.99	20.00	0.10	0.10	17.36	1.37	1	9.99
10-TR-019 BH10-12	gneiss	2.05	20.00	0.10	0.10	16.74	1.42	1	9.94
10-TR-020 BH10-12	gneiss	1.98	20.00	0.10	0.10	15.89	1.44	1	9.93
10-TR-021 BH10-12	gneiss	2.04	20.00	0.10	0.10	16.43	1.42	1	9.84
10-TR-034 BH10-21	schist	1.97	20.00	0.10	0.10	15.09	1.26	2	9.97
10-TR-035 BH10-12	schist	2.02	20.00	0.10	0.10	15.86	1.26	1	9.80
10-TR-036 BH10-12	schist	2.03	20.00	0.10	0.10	15.76	1.17	1	9.67
10-TR-022 BH10-13	sandstone	2.01	118.20	0.10	0.10	26.10	1.70	3	9.43
10-TR-023 BH10-13	sandstone	2.00	127.75	0.10	0.10	27.00	1.76	3	9.34
10-TR-024 BH10-13	sandstone	1.95	135.60	0.10	0.10	29.10	1.75	3	9.38
10-TR-025 BH10-14	sandy carbonate	2.03	589.90	0.10	0.10	200	1.51	4	8.27
10-TR-026 BH10-14	sandy carbonate	2.02	643.90	0.10	0.10	268	1.52	4	8.07
10-TR-027 BH10-14	sandy carbonate	2.00	641.20	0.10	0.10	259	1.50	4	8.22
10-TR-028 BH10-15	carbonate	1.97	685.90	0.10	0.10	301	1.50	4	8.22
10-TR-029 BH10-15	carbonate	1.96	640.00	0.10	0.10	266	1.50	4	8.38
10-TR-030 BH10-15	carbonate	1.98	490.00	0.10	0.10	116	1.71	4	8.23
10-TR-031 BH10-16	carbonate	1.99	490.00	0.10	0.10	106	1.74	4	8.23
10-TR-032 BH10-16	carbonate	1.98	474.20	0.10	0.10	93.80	1.78	4	8.27
10-TR-033 BH10-16	carbonate	1.96	470.00	0.10	0.10	96.20	1.76	4	8.26
S449-10	sand/gravel	2.00	393.20	0.10	0.10	122	1.60	4	8.75
S450-10	sand/gravel	2.01	338.10	0.10	0.10	57.00	1.85	4	8.38
S451-10	sand/gravel	1.97	131.70	0.10	0.10	38.20	1.55	4	8.55
S452-10	sand/gravel	1.97	146.40	0.10	0.10	48.00	1.59	4	8.97
S453-10	sand/gravel	1.99	135.30	0.10	0.10	29.10	1.69	4	8.87
S454-10	sand/gravel	1.95	20.00	0.10	0.10	17.94	1.11	1	8.42
S455-10	sand/gravel	1.96	26.00	0.10	0.10	11.31	1.57	1	9.51
S456-10	sand/gravel	1.97	79.10	0.10	0.10	20.21	1.75	3	8.99
S457-10	sand/gravel	2.00	83.90	0.10	0.10	15.24	1.85	3	9.07
S458-10	sand/gravel	1.97	55.40	0.10	0.10	21.25	1.58	3	9.24
S459-10	sand/gravel	2.03	154.20	0.10	0.10	28.60	1.83	4	8.86
S460-10	sand/gravel	1.96	77.40	0.10	0.10	23.81	1.65	4	8.93
S461-10	sand/gravel	1.99	97.90	0.10	0.10	21.30	1.78	3	9.14
S462-10	sand/gravel	2.01	153.10	0.10	0.10	28.40	1.82	3	8.95

Table 1 Acid Base Accounting Results (Continued)

Sample ID	Drill Log Lithology	Total Carbon	CO3	Total Sulphur	Sulphate Sulphur	Sulphide Sulphur	Neutralization Potential	Acid Potential
		%	%	%	%	%	kg $CaCO_3$/t	kg $CaCO_3$/t
10-TR-001 BH10-04	gneiss	0.059	0.103	0.014	0.01	<0.01	7.9	0.31
10-TR-002 BH10-04	gneiss	0.050	0.101	<0.005	<0.01	<0.01	8.1	0.31
10-TR-003 BH10-04	gneiss	0.064	0.137	<0.005	<0.01	<0.01	8.8	0.31
10-TR-004 BH10-05	gneiss	0.041	0.059	0.020	0.02	<0.01	7.4	0.31
10-TR-005 BH10-05	gneiss	0.032	0.033	0.015	0.01	<0.01	6.6	0.31
10-TR-006 BH10-05	gneiss	0.029	0.028	0.038	0.02	0.01	6.2	0.44
10-TR-007 BH10-06	gneiss	0.036	0.048	<0.005	<0.01	<0.01	7.5	0.31
10-TR-008 BH10-06	gneiss	0.028	0.025	0.008	<0.01	<0.01	7.3	0.31
10-TR-009 BH10-06	gneiss	0.035	0.075	0.006	<0.01	<0.01	7.7	0.31
10-TR-010 BH10-07	gneiss	0.027	0.014	0.035	0.02	0.01	9.5	0.36
10-TR-011 BH10-07	gneiss	0.038	0.027	0.036	0.04	<0.01	11.7	0.31
10-TR-012 BH10-07	gneiss	0.036	0.052	0.019	0.02	<0.01	11.5	0.31
10-TR-013 BH10-08	gneiss	0.028	0.035	<0.005	<0.01	<0.01	6.3	0.31
10-TR-014 BH10-08	gneiss	0.044	0.380	0.020	0.02	<0.01	9.6	0.31
10-TR-015 BH10-08	gneiss	0.043	0.062	0.028	0.03	<0.01	10.4	0.31
10-TR-016 BH10-09	gneiss	0.020	0.034	0.012	0.01	<0.01	6.2	0.31
10-TR-017 BH10-09	gneiss	0.070	0.048	0.012	0.01	<0.01	7.1	0.31
10-TR-018 BH10-09	gneiss	0.023	<0.005	0.038	0.04	<0.01	6.6	0.31
10-TR-019 BH10-12	gneiss	0.035	0.018	0.029	0.03	<0.01	8.0	0.31
10-TR-020 BH10-12	gneiss	0.051	0.071	0.028	0.02	0.01	10.4	0.40
10-TR-021 BH10-12	gneiss	0.046	0.065	0.006	<0.01	<0.01	8.8	0.31
10-TR-034 BH10-21	schist	0.096	0.282	0.015	0.02	<0.01	12.5	0.31
10-TR-035 BH10-12	schist	0.052	0.054	0.060	0.04	0.02	10.2	0.77
10-TR-036 BH10-12	schist	0.049	0.023	0.023	0.01	0.01	10.4	0.41
10-TR-022 BH10-13	sandstone	2.77	12.0	<0.005	<0.01	<0.01	229	0.31
10-TR-023 BH10-13	sandstone	2.98	12.5	<0.005	<0.01	<0.01	252	0.31
10-TR-024 BH10-13	sandstone	3.25	14.0	<0.005	<0.01	<0.01	273	0.31
10-TR-025 BH10-14	sandy carbonate	11.1	54.3	<0.005	<0.01	<0.01	959	0.31
10-TR-026 BH10-14	sandy carbonate	10.8	52.3	<0.005	<0.01	<0.01	930	0.31
10-TR-027 BH10-14	sandy carbonate	11.2	54.0	0.071	0.03	0.04	956	1.29
10-TR-028 BH10-15	carbonate	10.9	53.2	0.014	0.01	<0.01	978	0.31
10-TR-029 BH10-15	carbonate	10.7	51.3	0.041	0.02	0.02	953	0.77
10-TR-030 BH10-15	carbonate	10.7	51.5	0.020	<0.01	0.01	945	0.34
10-TR-031 BH10-16	carbonate	10.8	53.5	<0.005	<0.01	<0.01	965	0.31
10-TR-032 BH10-16	carbonate	10.7	52.9	<0.005	<0.01	<0.01	961	0.31
10-TR-033 BH10-16	carbonate	10.7	52.1	<0.005	<0.01	<0.01	954	0.31
S449-10	sand/gravel	7.86	33.9	0.011	0.01	<0.01	678	0.31
S450-10	sand/gravel	8.02	36.0	<0.005	<0.01	<0.01	699	0.31
S451-10	sand/gravel	2.92	11.7	<0.005	<0.01	<0.01	237	0.31
S452-10	sand/gravel	2.89	12.4	0.014	0.01	<0.01	250	0.31
S453-10	sand/gravel	3.22	13.9	<0.005	<0.01	<0.01	267	0.31
S454-10	sand/gravel	0.061	0.016	<0.005	<0.01	<0.01	5.3	0.31
S455-10	sand/gravel	0.410	0.255	<0.005	<0.01	<0.01	37.5	0.31
S456-10	sand/gravel	1.82	6.20	0.007	<0.01	<0.01	150	0.31
S457-10	sand/gravel	1.44	5.37	<0.005	<0.01	<0.01	172	0.31
S458-10	sand/gravel	1.12	4.17	0.007	<0.01	<0.01	86.7	0.31
S459-10	sand/gravel	3.87	16.2	<0.005	<0.01	<0.01	309	0.31
S460-10	sand/gravel	1.71	7.29	<0.005	<0.01	<0.01	137	0.31
S461-10	sand/gravel	2.33	10.2	0.005	<0.01	<0.01	192	0.31
S462-10	sand/gravel	3.75	16.7	0.007	<0.01	<0.01	310	0.31

Table 1 Acid Base Accounting Results (Continued)

Sample ID	Drill Log Lithology	Maximum Potential Acidity	Carbonate Neutralization Potential	Ratio NP/AP	Ratio NP/MPA	Ratio CaNP/AP	Net NP
		kg $CaCO_3$/t	kg $CaCO_3$/t	ratio	ratio	ratio	kg $CaCO_3$/t
10-TR-001 BH10-04	gneiss	0.44	4.92	25.5	18.1	15.9	7.59
10-TR-002 BH10-04	gneiss	0.16	4.17	26.1	51.8	13.4	7.79
10-TR-003 BH10-04	gneiss	0.16	5.33	28.4	56.3	17.2	8.49
10-TR-004 BH10-05	gneiss	0.63	3.42	23.9	11.8	11.0	7.09
10-TR-005 BH10-05	gneiss	0.47	2.67	21.3	14.1	8.6	6.29
10-TR-006 BH10-05	gneiss	1.19	2.42	14.2	5.2	5.5	5.76
10-TR-007 BH10-06	gneiss	0.16	3.00	24.2	48.0	9.7	7.19
10-TR-008 BH10-06	gneiss	0.25	2.33	23.5	29.2	7.5	6.99
10-TR-009 BH10-06	gneiss	0.19	2.92	24.8	41.1	9.4	7.39
10-TR-010 BH10-07	gneiss	1.09	2.25	26.2	8.7	6.3	9.14
10-TR-011 BH10-07	gneiss	1.13	3.17	37.7	10.4	10.2	11.4
10-TR-012 BH10-07	gneiss	0.59	3.00	37.1	19.4	9.7	11.2
10-TR-013 BH10-08	gneiss	0.16	2.33	20.3	40.3	7.5	5.99
10-TR-014 BH10-08	gneiss	0.63	3.67	31.0	15.4	11.8	9.29
10-TR-015 BH10-08	gneiss	0.88	3.58	33.5	11.9	11.6	10.1
10-TR-016 BH10-09	gneiss	0.38	1.67	20.0	16.5	5.4	5.89
10-TR-017 BH10-09	gneiss	0.38	5.83	22.9	18.9	18.8	6.79
10-TR-018 BH10-09	gneiss	1.19	1.92	21.3	5.6	6.2	6.29
10-TR-019 BH10-12	gneiss	0.91	2.92	25.8	8.8	9.4	7.69
10-TR-020 BH10-12	gneiss	0.88	4.25	26.0	11.9	10.6	10.0
10-TR-021 BH10-12	gneiss	0.19	3.83	28.4	46.9	12.4	8.49
10-TR-034 BH10-21	schist	0.47	8.00	40.3	26.7	25.8	12.2
10-TR-035 BH10-12	schist	1.88	4.33	13.3	5.4	5.6	9.43
10-TR-036 BH10-12	schist	0.72	4.08	25.6	14.5	10.0	9.99
10-TR-022 BH10-13	sandstone	0.16	230.85	739	1465.6	744.7	229
10-TR-023 BH10-13	sandstone	0.16	248.35	813	1612.8	801.1	252
10-TR-024 BH10-13	sandstone	0.16	270.85	881	1747.2	873.7	273
10-TR-025 BH10-14	sandy carbonate	0.16	925.06	3095	6137.6	2984.1	959
10-TR-026 BH10-14	sandy carbonate	0.16	900.06	2998	5952.0	2903.4	929
10-TR-027 BH10-14	sandy carbonate	2.22	933.40	742	430.9	723.6	955
10-TR-028 BH10-15	carbonate	0.44	908.39	3155	2235.4	2930.3	978
10-TR-029 BH10-15	carbonate	1.28	891.73	1245	743.8	1158.1	952
10-TR-030 BH10-15	carbonate	0.63	891.73	2749	1512.0	2622.7	945
10-TR-031 BH10-16	carbonate	0.16	900.06	3114	6176.0	2903.4	965
10-TR-032 BH10-16	carbonate	0.16	891.73	3099	6150.4	2876.5	960
10-TR-033 BH10-16	carbonate	0.16	891.73	3076	6105.6	2876.5	953
S449-10	sand/gravel	0.34	655.04	2185	1972.4	2113.0	677
S450-10	sand/gravel	0.16	668.38	2256	4473.6	2156.1	699
S451-10	sand/gravel	0.16	243.35	765	1516.8	785.0	237
S452-10	sand/gravel	0.44	240.85	805	571.4	776.9	249
S453-10	sand/gravel	0.16	268.35	861	1708.8	865.6	266
S454-10	sand/gravel	0.16	5.08	17.1	33.9	16.4	4.99
S455-10	sand/gravel	0.16	34.17	121	240.0	110.2	37.2
S456-10	sand/gravel	0.22	151.68	482	685.7	489.3	149
S457-10	sand/gravel	0.16	120.01	554	1100.8	387.1	171
S458-10	sand/gravel	0.22	93.34	280	396.3	301.1	86.4
S459-10	sand/gravel	0.16	322.52	998	1977.6	1040.4	309
S460-10	sand/gravel	0.16	142.51	441	876.8	459.7	136
S461-10	sand/gravel	0.16	194.18	621	1228.8	626.4	192
S462-10	sand/gravel	0.22	312.52	1001	1417.1	1008.1	310

Note:
CaNP = Carbonate neutralization potential was calculated based on total carbon content (%C)
MPA = Maximum potential acidity was calculated based on total sulphur content (%S)

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Table 2 Statistical Summary of Acid Base Accounting Results

	Paste pH	Total Carbon %	Total Sulphur %	Sulphate Sulphur %	Sulphide Sulphur %	Neutral-ization Potential kg $CaCO_3$/t	Acid Potential kg $CaCO_3$/t	CaNP kg $CaCO_3$/t	Maximum Potential Acidity kg $CaCO_3$/t	Ratio NP/AP (NPR) calculated ratio	Ratio NP/MPA calculated ratio	Ratio CaNP/AP calculated ratio
All Quarry Pit Rock (gneiss, schist, carbonate rocks)												
Min	8.1	0.02	<0.005	<0.01	<0.01	6.2	0.31	1.7	0.16	13	5.2	5.4
Max	10	11	0.071	0.04	0.04	978	1.29	933	2.2	3155	6176	2984
Mean	-	2.99	0.019	0.02	0.01	266	0.37	249	0.58	710	458	666
Median	9.7	0.1	<0.014	<0.01	<0.01	10.3	0.31	4.2	0.44	33	24	13.6
Standard Deviation	0.7	4.7	0.016	0.01	0.01	410	0.19	389	0.51	1191	2111	1130
No. of Samples	36	36	36	36	36	36	36	36	36	36	36	36
5th Percentile	8.2	0.026	0.005	0.01	0.01	6.3	0.31	2.2	0.16	19	5.5	5.6
25th Percentile	9.1	0.036	0.005	0.01	0.01	7.7	0.31	3.0	0.16	24	14	9.4
75th Percentile	9.9	5.1	0.028	0.02	0.01	437	0.31	426	0.88	830	1477	819
95th Percentile	10	11	0.046	0.04	0.02	962	0.77	913	1.43	3103	6141	2910
Gneiss												
Min	9.5	0.02	<0.005	<0.01	<0.01	6.2	0.31	1.7	0.16	14	5.2	5.4
Max	10	0.07	0.038	0.04	0.01	11.7	0.44	5.8	1.19	38	56	19
Mean	-	0.04	0.018	0.02	0.01	8.3	0.32	3.3	0.57	26	14	10
Median	9.8	0.04	0.015	<0.01	<0.01	7.9	0.31	3.0	0.47	25	17	9.7
Standard Deviation	0.17	0.01	0.012	0.01	0.00	1.7	0.03	1.1	0.38	5.6	17	3.7
No. of Samples	21	21	21	21	21	21	21	21	21	21	21	21
5th Percentile	9.5	0.02	0.005	0.01	0.01	6.2	0.31	1.9	0.16	20	5.6	5.5
25th Percentile	9.7	0.03	0.006	0.01	0.01	7.1	0.31	2.4	0.19	23	12	7.5
75th Percentile	9.9	0.05	0.028	0.02	0.01	9.5	0.31	3.8	0.88	28	40	12
95th Percentile	10	0.06	0.038	0.04	0.01	12	0.40	5.3	1.19	37	52	17
Schist												
Min	9.7	0.05	0.015	<0.01	<0.01	10	0.31	4.1	0.47	13.3	5.4	5.6
Max	10	0.10	0.060	0.04	0.02	13	0.77	8.0	1.88	40	27	26
Median	9.8	0.05	0.023	0.02	0.01	10	0.41	4.3	0.72	26	14	10
No. of Samples	3	3	3	3	3	3	3.00	3	3.00	3	3	3

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Table 2 Statistical Summary of Acid Base Accounting Results (Continued)

	Paste pH	Total Carbon %	Total Sulphur %	Sulphate Sulphur %	Sulphide Sulphur %	Neutralization Potential kg $CaCO_3$/t	Acid Potential kg $CaCO_3$/t	CaNP kg $CaCO_3$/t	Maximum Potential Acidity kg $CaCO_3$/t	Ratio NP/AP (NPR) calculated ratio	Ratio NP/MPA calculated ratio	Ratio CaNP/AP calculated ratio
Carbonate Rocks												
Min	8.1	2.8	<0.005	<0.01	<0.01	229	0.31	231	0.16	739	431	724
Max	9.4	11	0.071	0.03	0.04	978	1.29	933	2.2	3155	6176	2984
Mean	-	8.9	0.016	0.01	0.01	780	0.43	740	0.48	1803	1609	1712
Median	8.3	11	<0.005	<0.01	<0.01	954	0.31	892	0.16	3076	6102	2877
Standard Deviation	0.5	3.6	0.021	0.01	0.01	319	0.30	296	0.64	1122	2469	1044
No. of Samples	12	12	12	12	12	12	12	12	12	12	12	12
5th Percentile	8.2	2.9	0.005	0.01	0.01	242	0.31	240	0.16	741	603	735
25th Percentile	8.2	8.8	0.005	0.01	0.01	766	0.31	737	0.16	864	1500	856
75th Percentile	8.2	11	0.005	0.01	0.01	932	0.31	892	0.16	930	1526	912
95th Percentile	9.4	11	0.055	0.02	0.03	971	1.00	929	1.70	3132	6162	2954
Unconsolidated Borrow Material												
Min	8.4	0.1	<0.005	<0.01	<0.01	5.3	0.31	5.1	0.16	17	34	16
Max	9.5	8.0	0.014	0.01	0.01	699	0.31	668	0.44	2256	4474	2156
Mean	-	3.0	0.0065	0.01	0.01	252	0.31	247	0.20	813	1241	795
Median	8.9	2.6	<0.005	<0.01	<0.01	215	0.31	218	0.16	692	1373	702
Standard Deviation	0.3	2.4	0	0	0	207	0	200	0.09	667	1105	646
No. of Samples	14	14	14	14	14	14	14	14	14	14	14	14
5th Percentile	8.4	0.3	0.005	0.01	0.01	26	0.31	24	0.16	85	168	77
25th Percentile	8.8	1.5	0.005	0.01	0.01	140	0.31	126	0.16	451	600	405
75th Percentile	8.9	2.2	0.005	0.01	0.01	185	0.31	180	0.16	598	1024	579
95th Percentile	9.3	7.9	0.012	0.01	0.01	685	0.31	660	0.38	2210	2851	2128

Note:

CaNP = Carbonate neutralization potential was calculated based on total carbon content (%C)

MPA = Maximum potential acidity was calculated based on total sulphur content (%S)

Table 3 Results of Metals Analyses

Sample ID	Drill Log Lithology	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
		%	µg/g	µg/g	µg/g	µg/g	%	µg/g	µg/g	µg/g	µg/g
Average Crustal Abundance		8.23	1.8	425	3	0.0085	4.15	0.15	25	102	60
10x Average Crustal Abundance		82.3	18	4250	30	0.085	41.5	1.5	250	1020	600
10-TR-001 BH10-04	gneiss	0.33	<0.5	21	0.13	<0.09	0.12	<0.02	1.2	100	18
10-TR-002 BH10-04	gneiss	0.36	<0.5	23	0.15	<0.09	0.13	<0.02	1.1	99	5.0
10-TR-003 BH10-04	gneiss	0.35	<0.5	24	0.13	<0.09	0.14	<0.02	1.1	110	8.5
10-TR-004 BH10-05	gneiss	0.41	<0.5	23	0.17	<0.09	0.11	<0.02	1.5	91	2.9
10-TR-005 BH10-05	gneiss	0.39	<0.5	27	0.15	<0.09	0.07	<0.02	1.3	110	8.1
10-TR-006 BH10-05	gneiss	0.37	<0.5	20	0.18	<0.09	0.06	<0.02	1.3	87	3.2
10-TR-007 BH10-06	gneiss	0.43	<0.5	23	0.20	<0.09	0.10	<0.02	2.0	110	5.2
10-TR-008 BH10-06	gneiss	0.50	<0.5	25	0.29	<0.09	0.10	<0.02	2.3	110	6.6
10-TR-009 BH10-06	gneiss	0.49	<0.5	39	0.19	<0.09	0.14	<0.02	2.5	94	8.4
10-TR-010 BH10-07	gneiss	0.78	<0.5	68	0.25	<0.09	0.29	<0.02	5.2	92	17
10-TR-011 BH10-07	gneiss	1.20	<0.5	110	0.40	0.09	0.36	<0.02	8.0	75	17
10-TR-012 BH10-07	gneiss	1.10	<0.5	57	0.27	0.10	0.36	<0.02	9.9	110	16
10-TR-013 BH10-08	gneiss	0.32	<0.5	23	0.16	<0.09	0.07	<0.02	1.4	110	5.3
10-TR-014 BH10-08	gneiss	0.85	<0.5	64	0.49	<0.09	0.21	<0.02	4.4	79	10
10-TR-015 BH10-08	gneiss	1.00	<0.5	78	0.48	<0.09	0.23	<0.02	5.9	78	12
10-TR-016 BH10-09	gneiss	0.43	<0.5	33	0.14	<0.09	0.09	<0.02	2.4	82	4.3
10-TR-017 BH10-09	gneiss	0.45	<0.5	33	0.17	<0.09	0.14	<0.02	2.6	100	7.2
10-TR-018 BH10-09	gneiss	0.39	<0.5	32	0.14	0.13	0.11	0.05	4.9	81	12
10-TR-019 BH10-12	gneiss	0.59	<0.5	30	0.17	<0.09	0.26	<0.02	5.7	100	28
10-TR-020 BH10-12	gneiss	0.83	<0.5	51	0.18	<0.09	0.23	<0.02	6.1	100	14
10-TR-021 BH10-12	gneiss	0.49	<0.5	24	0.15	<0.09	0.19	<0.02	2.8	100	8.8
10-TR-034 BH10-21	schist	0.74	<0.5	36	0.17	<0.09	0.30	<0.02	2.2	67	6.3
10-TR-035 BH10-12	schist	1.10	<0.5	35	0.27	0.09	0.18	0.03	3.6	69	13
10-TR-036 BH10-12	schist	1.30	1.1	37	0.41	<0.09	0.14	<0.02	3.6	70	8.0
10-TR-022 BH10-13	carbonate rocks	0.05	<0.5	5.5	0.06	<0.09	3.9	<0.02	1.3	99	5.0
10-TR-023 BH10-13	carbonate rocks	0.31	<0.5	16	0.32	<0.09	4.1	0.03	2.1	96	6.1
10-TR-024 BH10-13	carbonate rocks	0.23	<0.5	13	0.22	<0.09	4.8	0.02	1.5	82	2.0
10-TR-025 BH10-14	carbonate rocks	0.08	<0.5	3.0	0.06	<0.09	28.8	<0.02	1.6	2.2	4.0
10-TR-026 BH10-14	carbonate rocks	0.16	0.7	5.3	0.14	<0.09	28.3	0.06	2.1	3.4	3.9
10-TR-027 BH10-14	carbonate rocks	0.08	0.5	2.7	0.06	<0.09	27.0	<0.02	1.6	2.6	4.3
10-TR-028 BH10-15	carbonate rocks	0.08	0.6	3.4	0.07	<0.09	28.2	<0.02	1.7	4.1	2.2
10-TR-029 BH10-15	carbonate rocks	0.12	1.8	4.5	0.08	<0.09	26.7	<0.02	1.9	2.2	4.5
10-TR-030 BH10-15	carbonate rocks	0.13	1.2	4.2	0.08	<0.09	28.4	<0.02	2.0	2.6	5.4
10-TR-031 BH10-16	carbonate rocks	0.08	<0.5	3.2	0.06	<0.09	27.4	<0.02	1.7	2.1	2.0
10-TR-032 BH10-16	carbonate rocks	0.08	1.2	3.1	0.07	<0.09	27.3	<0.02	1.7	2.2	3.9
10-TR-033 BH10-16	carbonate rocks	0.13	1.1	3.9	0.07	<0.09	27.5	<0.02	1.9	2.6	2.4
S449-10	borrow pit material	0.26	1.7	11	0.18	<0.09	13.4	0.03	2.9	39	8.1
S450-10	borrow pit material	0.12	<0.5	6.7	0.09	<0.09	17.2	<0.02	1.9	30	3.5
S451-10	borrow pit material	0.29	0.8	16	0.20	<0.09	4.0	0.03	3.0	89	12
S452-10	borrow pit material	0.39	<0.5	29	0.18	<0.09	5.0	<0.02	3.2	64	8.3
S453-10	borrow pit material	0.20	1.2	16	0.27	<0.09	4.8	0.02	3.4	79	7.5
S454-10	borrow pit material	0.08	<0.5	5.0	0.03	<0.09	0.1	<0.02	0.73	110	2.0
S455-10	borrow pit material	0.24	<0.5	20	0.12	<0.09	0.6	0.02	7.0	170	10
S456-10	borrow pit material	0.35	<0.5	16	0.21	<0.09	3.6	<0.02	2.0	75	6.9
S457-10	borrow pit material	0.39	<0.5	25	0.25	<0.09	2.4	<0.02	2.5	90	4.3
S458-10	borrow pit material	0.38	0.7	25	0.21	<0.09	1.8	<0.02	2.0	82	6.7
S459-10	borrow pit material	0.18	<0.5	9.6	0.14	<0.09	7.4	<0.02	1.7	68	4.2
S460-10	borrow pit material	0.20	<0.5	12	0.13	<0.09	3.6	<0.02	1.5	93	19
S461-10	borrow pit material	0.29	<0.5	15	0.17	<0.09	3.6	<0.02	1.8	74	38
S462-10	borrow pit material	0.25	<0.5	14	0.19	<0.09	6.2	<0.02	1.8	73	8.7

Table 3 Results of Metals Analyses (Continued)

Sample ID	Drill Log Lithology	Fe	K	Li	Mg	Mn	Mo	Na	Ni	P	Pb
		%	%	µg/g	%	µg/g	µg/g	%	µg/g	µg/g	µg/g
Average Crustal Abundance		5.63	2.085	20	2.33	950	1.2	2.355	84	1050	14
10x Average Crustal Abundance		56.3	20.85	200	23.3	9500	12	23.55	840	10500	140
10-TR-001 BH10-04	gneiss	0.71	0.15	15	0.12	150	0.4	0.05	3.9	25	11
10-TR-002 BH10-04	gneiss	0.66	0.17	18	0.13	180	0.4	0.05	4.1	28	9.3
10-TR-003 BH10-04	gneiss	0.76	0.17	14	0.13	160	0.4	0.05	3.9	47	7.1
10-TR-004 BH10-05	gneiss	0.88	0.17	13	0.20	200	0.4	0.05	3.8	140	5.4
10-TR-005 BH10-05	gneiss	0.82	0.16	11	0.16	190	0.3	0.05	4.3	67	4.1
10-TR-006 BH10-05	gneiss	0.75	0.11	10	0.16	170	0.6	0.05	3.7	61	4.0
10-TR-007 BH10-06	gneiss	0.88	0.24	15	0.22	140	0.3	0.05	3.8	210	4.2
10-TR-008 BH10-06	gneiss	0.93	0.19	15	0.29	160	0.2	0.05	3.7	230	3.8
10-TR-009 BH10-06	gneiss	1.20	0.33	19	0.24	160	0.2	0.05	4.3	270	6.5
10-TR-010 BH10-07	gneiss	1.90	0.56	23	0.50	280	0.4	0.06	5.6	630	9.3
10-TR-011 BH10-07	gneiss	2.60	0.71	36	0.93	300	0.5	0.05	7.1	1000	2.8
10-TR-012 BH10-07	gneiss	1.86	0.72	34	1.10	290	2.1	0.06	25	440	3.2
10-TR-013 BH10-08	gneiss	0.83	0.17	11	0.16	150	0.3	0.05	3.4	92	5.3
10-TR-014 BH10-08	gneiss	1.40	0.49	26	0.59	240	0.4	0.04	4.9	490	2.5
10-TR-015 BH10-08	gneiss	1.70	0.70	29	0.76	320	0.2	0.04	5.3	670	2.0
10-TR-016 BH10-09	gneiss	1.00	0.28	17	0.23	150	2.5	0.05	3.2	230	6.6
10-TR-017 BH10-09	gneiss	1.20	0.30	20	0.25	180	1.1	0.05	4.2	260	5.8
10-TR-018 BH10-09	gneiss	0.95	0.28	13	0.20	140	1.5	0.05	3.4	220	29
10-TR-019 BH10-12	gneiss	1.10	0.35	10	0.46	180	1.0	0.06	20	160	5.0
10-TR-020 BH10-12	gneiss	1.90	0.54	20	0.64	280	6.8	0.05	15	220	6.8
10-TR-021 BH10-12	gneiss	1.40	0.27	9	0.30	140	3.4	0.05	5.0	250	12
10-TR-034 BH10-21	schist	1.10	0.54	8	0.41	250	0.4	0.03	2.9	120	3.2
10-TR-035 BH10-12	schist	1.60	0.60	12	0.74	280	0.2	0.03	3.1	260	3.3
10-TR-036 BH10-12	schist	1.80	0.50	17	1.00	280	0.4	0.03	3.8	120	1.7
10-TR-022 BH10-13	carbonate rocks	0.40	0.04	<2	2.20	270	0.5	0.01	5.0	370	0.83
10-TR-023 BH10-13	carbonate rocks	0.73	0.17	18	2.60	280	0.4	0.01	8.9	540	0.98
10-TR-024 BH10-13	carbonate rocks	0.58	0.14	13	2.80	340	<0.1	0.02	7.0	1090	0.89
10-TR-025 BH10-14	carbonate rocks	0.16	0.03	<2	0.65	70	<0.1	0.02	14	21	1.0
10-TR-026 BH10-14	carbonate rocks	0.28	0.04	<2	0.41	120	<0.1	0.01	15	43	1.6
10-TR-027 BH10-14	carbonate rocks	0.17	0.03	<2	1.30	71	<0.1	0.01	14	42	1.1
10-TR-028 BH10-15	carbonate rocks	0.19	0.03	<2	0.95	77	<0.1	0.02	14	78	1.3
10-TR-029 BH10-15	carbonate rocks	0.25	0.04	2	0.57	170	<0.1	0.02	15	85	2.0
10-TR-030 BH10-15	carbonate rocks	0.25	0.04	3	0.66	120	<0.1	0.02	15	86	1.6
10-TR-031 BH10-16	carbonate rocks	0.17	0.03	<2	0.98	66	<0.1	0.02	14	57	1.2
10-TR-032 BH10-16	carbonate rocks	0.18	0.03	<2	0.98	62	<0.1	0.02	14	70	1.4
10-TR-033 BH10-16	carbonate rocks	0.26	0.05	3	0.86	89	<0.1	0.02	15	92	1.8
S449-10	borrow pit material	0.59	0.18	24	4.90	140	0.5	0.02	11	130	4.3
S450-10	borrow pit material	0.34	0.07	<2	2.90	100	0.2	0.02	10	120	1.9
S451-10	borrow pit material	0.74	0.12	5	2.50	130	0.3	0.02	10	230	7.0
S452-10	borrow pit material	0.99	0.24	10	2.10	140	0.2	0.03	6.9	200	3.8
S453-10	borrow pit material	0.89	0.09	4	2.80	270	0.1	0.02	8.6	830	2.1
S454-10	borrow pit material	0.30	0.03	<2	0.03	25	0.4	0.01	3.4	16	0.75
S455-10	borrow pit material	1.10	0.09	2	1.20	120	0.3	0.02	110	130	2.7
S456-10	borrow pit material	0.79	0.13	9	1.10	140	0.5	0.03	5.2	140	3.5
S457-10	borrow pit material	0.81	0.15	11	1.20	130	0.2	0.03	5.7	140	3.7
S458-10	borrow pit material	0.87	0.16	9	1.00	130	0.4	0.03	5.1	240	4.5
S459-10	borrow pit material	0.50	0.07	5	2.00	94	0.3	0.02	6.3	120	2.2
S460-10	borrow pit material	0.53	0.09	3	0.77	74	0.6	0.02	5.5	140	2.0
S461-10	borrow pit material	0.70	0.12	8	1.90	130	0.3	0.03	4.6	170	3.8
S462-10	borrow pit material	0.63	0.11	7	2.70	100	0.3	0.02	6.6	110	3.3

Table 3 Results of Metals Analyses (Continued)

Sample ID	Drill Log Lithology	Sb	Se	Si	Sn	Sr	Ti	Tl	U	V	Y	Zn
		µg/g	µg/g	µg/g	µg/g	µg/g	%	µg/g	µg/g	µg/g	µg/g	µg/g
Average Crustal Abundance		0.2	0.05	281500	2.3	370	0.565	0.85	2.7	120	33	70
10x Average Crustal Abundance		2	0.5	2815000	23	3700	5.65	8.5	27	1200	330	700
10-TR-001 BH10-04	gneiss	<0.8	0.8	530	<0.5	6.6	0.02	0.07	4.8	3	2.0	20
10-TR-002 BH10-04	gneiss	<0.8	<0.7	450	<0.5	6.6	0.02	0.09	5.2	3	2.2	20
10-TR-003 BH10-04	gneiss	<0.8	<0.7	480	<0.5	6.2	0.02	0.08	4.4	3	2.4	21
10-TR-004 BH10-05	gneiss	<0.8	<0.7	440	<0.5	5.6	0.02	0.10	5.2	5	4.1	21
10-TR-005 BH10-05	gneiss	<0.8	<0.7	460	<0.5	6.3	0.02	0.07	2.8	3	2.7	22
10-TR-006 BH10-05	gneiss	<0.8	<0.7	440	<0.5	5.6	0.01	0.06	13	3	3.9	18
10-TR-007 BH10-06	gneiss	<0.8	<0.7	490	<0.5	6.5	0.04	0.12	2.1	9	4.1	24
10-TR-008 BH10-06	gneiss	<0.8	<0.7	560	<0.5	6.2	0.03	0.10	2.7	10	4.9	27
10-TR-009 BH10-06	gneiss	<0.8	<0.7	530	0.6	7.6	0.06	0.23	6.0	14	6.7	31
10-TR-010 BH10-07	gneiss	<0.8	<0.7	700	1.2	13	0.17	0.38	4.5	32	16	46
10-TR-011 BH10-07	gneiss	<0.8	<0.7	650	0.8	14	0.19	0.44	4.0	48	14	49
10-TR-012 BH10-07	gneiss	<0.8	<0.7	780	<0.5	7.3	0.14	0.48	3.5	43	9.8	36
10-TR-013 BH10-08	gneiss	<0.8	<0.7	500	<0.5	6.6	0.03	0.07	2.5	5	3.3	19
10-TR-014 BH10-08	gneiss	<0.8	<0.7	690	<0.5	8.5	0.09	0.31	4.7	22	7.1	34
10-TR-015 BH10-08	gneiss	<0.8	<0.7	610	<0.5	8.2	0.13	0.46	3.1	28	8.2	50
10-TR-016 BH10-09	gneiss	<0.8	<0.7	470	<0.5	6.6	0.06	0.17	2.6	13	3.7	23
10-TR-017 BH10-09	gneiss	<0.8	<0.7	460	0.6	7.1	0.07	0.19	4.2	15	4.7	31
10-TR-018 BH10-09	gneiss	<0.8	<0.7	520	<0.5	8.1	0.06	0.22	9.6	12	5.5	29
10-TR-019 BH10-12	gneiss	<0.8	<0.7	470	<0.5	6.8	0.08	0.19	2.9	19	3.5	24
10-TR-020 BH10-12	gneiss	<0.8	<0.7	600	1.2	9.7	0.12	0.31	4.0	30	3.4	38
10-TR-021 BH10-12	gneiss	<0.8	<0.7	600	0.8	17	0.07	0.13	4.9	12	8.2	31
10-TR-034 BH10-21	schist	<0.8	1.5	540	<0.5	5.8	0.06	0.21	2.2	6	3.9	23
10-TR-035 BH10-12	schist	<0.8	2.2	590	<0.5	4.8	0.06	0.21	2.3	6	7.4	26
10-TR-036 BH10-12	schist	<0.8	0.9	630	<0.5	3.4	0.03	0.15	2.2	7	5.2	28
10-TR-022 BH10-13	carbonate rocks	<0.8	<0.7	270	<0.5	14	0.00	0.02	0.31	7	2.3	2.2
10-TR-023 BH10-13	carbonate rocks	<0.8	<0.7	590	<0.5	24	0.02	0.04	0.40	11	5.0	9.9
10-TR-024 BH10-13	carbonate rocks	<0.8	1.0	450	<0.5	22	0.01	0.02	0.41	7	9.1	5.8
10-TR-025 BH10-14	carbonate rocks	<0.8	<0.7	390	<0.5	290	0.00	<0.02	0.30	4	1.5	4.0
10-TR-026 BH10-14	carbonate rocks	<0.8	<0.7	420	<0.5	300	0.00	<0.02	0.34	5	4.0	6.4
10-TR-027 BH10-14	carbonate rocks	<0.8	0.9	350	<0.5	280	0.00	<0.02	0.34	4	1.6	4.5
10-TR-028 BH10-15	carbonate rocks	<0.8	0.9	530	<0.5	270	0.00	<0.02	0.34	4	2.2	3.3
10-TR-029 BH10-15	carbonate rocks	<0.8	1.0	340	<0.5	240	0.00	<0.02	0.39	5	2.8	6.1
10-TR-030 BH10-15	carbonate rocks	<0.8	1.0	430	<0.5	290	0.00	<0.02	0.33	5	2.9	6.2
10-TR-031 BH10-16	carbonate rocks	<0.8	1.5	440	<0.5	270	0.00	<0.02	0.28	4	1.8	3.0
10-TR-032 BH10-16	carbonate rocks	<0.8	1.8	400	<0.5	260	0.00	<0.02	0.32	4	2.2	5.0
10-TR-033 BH10-16	carbonate rocks	<0.8	1.0	420	<0.5	270	0.00	<0.02	0.34	5	2.7	3.9
S449-10	borrow pit material	<0.8	2.1	520	<0.5	85	0.01	0.05	0.37	12	3.5	9.6
S450-10	borrow pit material	<0.8	0.9	350	<0.5	130	0.01	0.03	0.36	7	2.1	4.4
S451-10	borrow pit material	<0.8	1.2	470	<0.5	18	0.03	0.07	0.47	13	4.4	14
S452-10	borrow pit material	<0.8	1.1	530	0.7	31	0.05	0.11	1.2	15	3.2	18
S453-10	borrow pit material	<0.8	1.7	430	<0.5	21	0.01	<0.02	0.57	10	3.4	7.7
S454-10	borrow pit material	<0.8	1.9	310	<0.5	2.2	0.00	<0.02	0.24	1	0.60	1.7
S455-10	borrow pit material	<0.8	2.0	610	<0.5	5.3	0.02	0.03	0.71	8	2.2	13
S456-10	borrow pit material	<0.8	1.8	370	0.6	27	0.02	0.06	1.7	9	3.8	17
S457-10	borrow pit material	<0.8	1.4	440	<0.5	18	0.02	0.07	2.3	10	4.3	14
S458-10	borrow pit material	<0.8	2.0	520	0.6	13	0.03	0.08	2.6	9	4.8	18
S459-10	borrow pit material	<0.8	2.0	380	<0.5	47	0.01	<0.02	0.68	7	2.4	6.9
S460-10	borrow pit material	<0.8	1.7	370	<0.5	27	0.01	<0.02	0.62	6	2.0	12
S461-10	borrow pit material	<0.8	1.9	400	0.8	21	0.02	0.04	1.8	8	3.4	20
S462-10	borrow pit material	<0.8	1.8	400	<0.5	36	0.02	0.03	1.3	8	2.8	13

*Price (1997)

Table 4 Statistical Summary of Metals Analyses

	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn
	%	µg/g	µg/g	µg/g	µg/g	%	µg/g	µg/g	µg/g	µg/g	%	%	µg/g	%	µg/g
Average Concentration (Continental Crust)*	8.2	1.8	425	3	0.0085	4.15	0.15	25	102	60	5.63	2.09	20	2.33	950
Ten Times Average Concentration (Continental Crust)*	82	18	4250	30	0.085	42	1.5	250	1020	600	56	21	200	23.3	9500
All Quarry Pit Rock (gneiss, schist, carbonate rocks)															
Min	0.05	0.50	2.7	0.1	0.09	0.06	0.02	1.1	2.1	2.0	0.16	0.03	2.0	0.12	62
Max	1.30	1.8	110	0.5	0.13	29	0.06	9.9	110	28	2.60	0.72	36	2.80	340
Mean	0.46	0.62	28	0.2	0.09	7.40	0.02	2.9	70	8.1	0.93	0.26	13	0.69	186
Median	0.39	0.50	24	0.2	0.09	0.23	0.02	2.1	85	6.2	0.86	0.17	13	0.54	170
Standard Deviation	0.35	0.29	24	0.1	0.01	12	0.01	2.1	41	5.7	0.62	0.22	9.2	0.66	80
No. of Samples	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
5th Percentile	0.08	0.5	3.1	0.06	0.09	0.07	0.02	1.2	2.2	2.2	0.17	0.03	2.0	0.13	69
25th Percentile	0.15	0.5	5.5	0.12	0.09	0.13	0.02	1.6	51	4.2	0.37	0.05	3.0	0.23	140
75th Percentile	0.63	0.5	35	0.23	0.09	10	0.02	3.6	100	11	1.25	0.39	18	0.94	273
95th Percentile	1.13	1.2	71	0.43	0.09	28	0.04	6.6	110	17	1.90	0.70	30	2.30	305
Gneiss															
Min	0.32	0.5	20	0.13	0.09	0.06	0.02	1.1	75	2.9	0.66	0.11	9.0	0.12	140
Max	1.20	0.5	110	0.49	0.13	0.36	0.1	9.9	110	28	2.60	0.72	36	1.10	320
Mean	0.57	0.5	39	0.22	0.09	0.17	0.02	3.5	96	10	1.21	0.34	18	0.37	198
Median	0.45	0.5	30	0.17	0.09	0.14	0.02	2.5	100	8.5	1.00	0.28	15	0.24	180
Standard Deviation	0.27	0.0	24	0.11	0.01	0.09	0.01	2.5	12	6.2	0.51	0.20	7.7	0.28	60
No. of Samples	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
5th Percentile	0.33	0.5	21	0.13	0.09	0.07	0.02	1.1	78	3.2	0.71	0.15	10	0.13	140
25th Percentile	0.39	0.5	23	0.15	0.09	0.10	0.02	1.4	87	5.3	0.83	0.17	13	0.16	150
75th Percentile	0.78	0.5	51	0.25	0.09	0.23	0.02	5.2	110	14	1.40	0.49	20	0.50	240
95th Percentile	1.10	0.5	78	0.48	0.10	0.36	0.02	8.0	110	18	1.90	0.71	34	0.93	300
Schist															
Min	0.74	0.5	35	0.2	0.09	0.14	0.02	2.2	67	6.3	1.10	0.50	8.0	0.41	250
Max	1.30	1.1	37	0.4	0.09	0.30	0.03	3.6	70	13	1.80	0.60	17.0	1.00	280
Median	1.10	0.5	36	0.3	0.09	0.18	0.02	3.6	69	8.0	1.60	0.54	12.0	0.74	280
No. of Samples	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 4 Statistical Summary of Metals Analyses (Continued)

	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn
	%	µg/g	µg/g	µg/g	µg/g	%	µg/g	µg/g	µg/g	µg/g	%	%	µg/g	%	µg/g
Average Concentration (Continental Crust)*	8.2	1.8	425	3	0.0085	4.15	0.15	25	102	60	5.63	2.09	20	2.33	950
Ten Times Average Concentration (Continental Crust)*	82	18	4250	30	0.085	42	1.5	250	1020	600	56	21	200	23.3	9500
Carbonate Rocks															
Min	0.05	0.5	2.7	0.06	0.09	3.90	0.02	1.3	2.1	2.0	0.16	0.03	2.0	0.41	62
Max	0.31	1.8	16	0.32	0.09	29	0.06	2.1	99	6.1	0.73	0.17	18	2.80	340
Mean	0.13	0.8	5.7	0.11	0.09	22	0.02	1.8	25	3.8	0.30	0.06	4.4	1.25	145
Median	0.10	0.6	4.1	0.07	0.09	27	0.02	1.7	2.6	4.0	0.25	0.04	2.0	0.97	105
Standard Deviation	0.08	0.4	4.3	0.08	0	11	0.01	0.2	41	1.4	0.18	0.05	5.3	0.82	98
No. of Samples	12.0	12	12	12	12	12	12	12	12	12	12	12	12	12	12
5th Percentile	0.07	0.5	2.9	0.06	0.09	4.01	0.02	1.4	2.2	2.0	0.17	0.03	2.0	0.50	64
25th Percentile	0.08	0.5	3.2	0.06	0.09	21	0.02	1.6	2.2	2.4	0.18	0.03	2.0	0.66	71
75th Percentile	0.14	1.1	5.4	0.10	0.09	28	0.02	1.9	24	4.6	0.31	0.04	3.0	1.53	195
95th Percentile	0.27	1.5	14	0.27	0.09	29	0.04	2.1	97	5.7	0.65	0.15	15	2.69	307
Unconsolidated Borrow Material															
Min	0.08	0.5	5.0	0.03	0.09	0.05	0.02	0.7	30	2.0	0.30	0.03	2.0	0.03	25
Max	0.39	1.7	29	0.27	0.09	17	0.03	7.0	170	38.0	1.10	0.24	24	4.90	270
Mean	0.26	0.7	16	0.17	0.09	5.3	0.02	2.5	81	9.9	0.70	0.12	7.2	1.94	123
Median	0.26	0.5	16	0.18	0.09	3.8	0.02	2.0	77	7.8	0.72	0.12	6.0	1.95	130
Standard Deviation	0.10	0.4	7.0	0.06	0	4.8	0.004	1.5	33	9.1	0.23	0.05	5.8	1.21	53
No. of Samples	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
5th Percentile	0.11	0.5	6.1	0.07	0.09	0.41	0.02	1.2	36	3.0	0.33	0.05	2.0	0.51	57
25th Percentile	0.20	0.5	11	0.13	0.09	2.7	0.02	1.8	69	4.9	0.55	0.09	3.3	1.13	100
75th Percentile	0.34	0.7	19	0.21	0.09	5.9	0.02	3.0	90	9.7	0.86	0.15	9.0	2.65	138
95th Percentile	0.39	1.4	26	0.26	0.09	15	0.03	4.7	131	26	1.03	0.20	16	3.60	186

Table 4 Statistical Summary of Metals Analyses (Continued)

	Mo	Na	Ni	P	Pb	Sb	Se	Si	Sn	Sr	Ti	Tl	U	V	Y	Zn
	µg/g	%	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	%	µg/g	µg/g	µg/g	µg/g	µg/g
Average Concentration (Continental Crust)*	1.2	2.4	84	1050	14	0.2	0.05	281500	2.3	370	0.57	0.85	2.7	120	33	70
Ten Times Average Concentration (Continental Crust)*	12	24	840	10500	140	2	0.5	2815000	23	3700	5.7	8.5	27	1200	330	700
All Quarry Pit Rock (gneiss, sch																
Min	0.10	0.012	2.9	21	0.8	0.8	0.7	270	0.5	3.4	0.001	0.02	0.3	3.0	1.5	2.2
Max	6.8	0.062	25	1090	29.0	0.8	2.2	780	1.2	300	0.19	0.48	13.0	48.0	16	50.0
Mean	0.73	0.038	8.3	245	4.7	0.8	0.9	506	0.6	75.4	0.05	0.14	3.0	11.6	4.9	20.9
Median	0.40	0.047	5.0	150	3.3	0.8	0.7	485	0.5	8.2	0.03	0.10	2.7	6.5	3.9	21.5
Standard Deviation	1.3	0.017	5.8	261	5.1	0.0	0.3	108	0.2	117	0.05	0.14	2.8	11	3.3	14
No. of Samples	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
5th Percentile	0.10	0.014	3.2	27	1.0	0.8	0.7	348	0.5	5.4	0.001	0.02	0.3	3.0	1.8	3.2
25th Percentile	0.10	0.016	3.8	69	1.6	0.8	0.7	440	0.5	6.6	0.002	0.02	0.4	4.0	2.6	6.2
75th Percentile	0.50	0.052	14	263	6.0	0.8	0.9	590	0.5	78	0.06	0.21	4.4	13.3	5.8	29.5
95th Percentile	2.7	0.056	16	753	11.3	0.8	1.6	693	0.9	290	0.15	0.45	6.9	34.8	10.9	46.8
Gneiss																
Min	0.20	0.040	3.2	25	2.0	0.8	0.7	440	0.5	5.6	0.01	0.06	2.1	3.0	2.0	18.0
Max	6.8	0.062	25	1000	29.0	0.8	0.8	780	1.2	17	0.19	0.48	13.0	48.0	16	50.0
Mean	1.1	0.051	6.6	273	6.9	0.8	0.7	544	0.6	8.1	0.07	0.20	4.6	15.8	5.7	29.2
Median	0.40	0.051	4.2	220	5.4	0.8	0.7	520	0.5	6.8	0.06	0.17	4.2	12.0	4.1	27.0
Standard Deviation	1.6	0.005	5.9	248	5.7	0.0	0.0	97	0.2	3.0	0.05	0.14	2.5	13.4	3.8	9.9
No. of Samples	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
5th Percentile	0.20	0.042	3.4	28	2.5	0.8	0.7	440	0.5	5.6	0.02	0.07	2.5	3.0	2.2	19.0
25th Percentile	0.30	0.049	3.8	92	4.0	0.8	0.7	470	0.5	6.5	0.02	0.09	2.9	5.0	3.4	21.0
75th Percentile	1.1	0.053	5.3	270	7.1	0.8	0.7	600	0.6	8.2	0.09	0.31	4.9	22.0	7.1	34.0
95th Percentile	3.4	0.056	20	670	12.0	0.8	0.7	700	1.2	14	0.17	0.46	9.6	43.0	14.0	49.0
Schist																
Min	0.20	0.031	2.9	120	1.7	0.8	0.9	540	0.5	3.4	0.03	0.2	2.2	6.0	3.9	23.0
Max	0.40	0.033	3.8	260	3.3	0.8	2.2	630	0.5	5.8	0.06	0.2	2.3	7.0	7.4	28.0
Median	0.40	0.033	3.1	120	3.2	0.8	1.5	590	0.5	4.8	0.06	0.2	2.2	6.0	5.2	26
No. of Samples	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

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Table 4 Statistical Summary of Metals Analyses (Continued)

	Mo	Na	Ni	P	Pb	Sb	Se	Si	Sn	Sr	Ti	Tl	U	V	Y	Zn
	µg/g	%	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	µg/g	%	µg/g	µg/g	µg/g	µg/g	µg/g
Average Concentration (Continental Crust)*	1.2	2.4	84	1050	14	0.2	0.05	281500	2.3	370	0.57	0.85	2.7	120	33	70
Ten Times Average Concentration (Continental Crust)*	12	24	840	10500	140	2	0.5	2815000	23	3700	5.7	8.5	27	1200	330	700
Carbonate Rocks																
Min	0.10	0.012	5	21	0.8	0.8	0.7	270	0.5	14	0.001	0.02	0.3	4.0	1.5	2.2
Max	0.50	0.018	15	1090	2.0	0.8	1.8	590	0.5	300	0.02	0.04	0.4	11.0	9.1	9.9
Mean	0.16	0.015	13	215	1.3	0.8	1.0	419	0.5	211	0.004	0.02	0.3	5.4	3.2	5.0
Median	0.10	0.015	14	82	1.3	0.8	1.0	420	0.5	270	0.001	0.02	0.3	5.0	2.5	4.8
Standard Deviation	0.14	0.002	3.5	317	0.4	0	0.3	84	0	116	0.01	0.01	0.0	2.1	2.1	2.1
No. of Samples	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
5th Percentile	0.10	0.013	6.1	33	0.9	0.8	0.7	309	0.5	18	0.001	0.02	0.3	4.0	1.6	2.6
25th Percentile	0.10	0.014	13	54	1.0	0.8	0.7	380	0.5	186	0.001	0.02	0.3	4.0	2.1	3.8
75th Percentile	0.10	0.016	15	162	1.6	0.8	1.0	443	0.5	283	0.002	0.02	0.4	5.5	3.2	6.1
95th Percentile	0.45	0.017	15	788	1.9	0.8	1.6	557	0.5	295	0.02	0.03	0.4	8.8	6.8	8.0
Unconsolidated Borrow Materia																
Min	0.10	0.011	3.4	16	0.8	0.8	0.9	310	0.5	2.2	0.004	0.02	0.2	1.0	0.6	1.7
Max	0.60	0.031	110	830	7.0	0.8	2.1	610	0.8	130	0.05	0.11	2.6	15.0	4.8	20.0
Mean	0.33	0.021	14	194	3.3	0.8	1.7	436	0.6	34	0.02	0.05	1.1	8.8	3.1	12.1
Median	0.30	0.020	6.5	140	3.4	0.8	1.8	415	0.5	24	0.02	0.04	0.7	8.5	3.3	13.0
Standard Deviation	0.14	0.006	28	191	1.5	0.0	0.4	84	0.1	34	0.01	0.03	0.8	3.4	1.1	5.4
No. of Samples	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
5th Percentile	0.17	0.014	4.2	77	1.5	0.8	1.0	336	0.5	4.2	0.01	0.02	0.3	4.3	1.5	3.5
25th Percentile	0.23	0.017	5.3	123	2.1	0.8	1.5	373	0.5	18	0.01	0.02	0.5	7.3	2.3	8.2
75th Percentile	0.40	0.026	9.7	193	3.8	0.8	2.0	508	0.6	35	0.02	0.07	1.6	10.0	3.7	16.3
95th Percentile	0.54	0.030	46	447	5.4	0.8	2.0	558	0.7	101	0.03	0.09	2.4	13.7	4.5	18.7

*Price (1997)

Table 5 Results of
Shake Flask Extraction Test

	Units	MMER	CWQG (PAL)	CDWQ	10-TR-001 BH10-04 Gneiss	10-TR-005 BH10-05 Gneiss	10-TR-009 BH10-06 Gneiss	10-TR-014 BH10-08 Gneiss	10-TR-017 BH10-09 Gneiss	10-TR-019 BH10-12 Gneiss	10-TR-035 BH10-12 Schist
Sample Weight	g				250	250	250	250	250	250	250
Volume mL	D.I. H_2O				750	750	750	750	750	750	750
InitialpH	units				9.51	9.41	9.63	9.63	9.59	9.58	9.74
Final pH	units	6.0 - 9.5	6.5 - 9.0	6.5 - 8.5	9.45	**9.64**	**9.73**	**9.67**	**9.69**	**9.73**	**9.67**
Mercury (Hg)	mg/L	-	0.026	0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aluminum (Al)	mg/L	-	0.005-0.1[a]	-	0.97	0.84	0.98	0.58	0.91	0.75	1.42
Arsenic (As)	mg/L	0.5	0.005	0.005	0.0013	0.0004	0.0009	0.0005	0.0005	<0.0002	0.0012
Barium (Ba)	mg/L	-	-	1	0.00450	0.00444	0.00438	0.00420	0.00340	0.00309	0.00449
Beryllium (Be)	mg/L	-	-	-	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Bismuth (Bi)	mg/L	-	-	-	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Calcium (Ca)	mg/L	-	-	-	2.95	3.01	2.86	2.96	2.59	2.25	1.29
Cadmium (Cd)	mg/L	-	0.000017	0.005	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003
Cobalt (Co)	mg/L	-	-	-	0.000028	0.000030	0.000049	0.000060	0.000053	0.000122	0.000062
Chromium (Cr)	mg/L	-	0.001	0.051	<0.0005	0.0009	0.0010	<0.0005	0.0011	0.0013	0.0010
Copper (Cu)	mg/L	0.3	0.002-0.004[b]	≤1.0[c]	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005
Iron (Fe)	mg/L	-	0.3	<0.3[c]	0.069	0.094	0.115	0.127	0.116	0.186	0.233
Potassium (K)	mg/L	-	-	-	6.75	6.51	8.50	8.88	7.66	8.41	13.8
Lithium (Li)	mg/L	-	-	-	0.006	0.006	0.011	0.016	0.012	0.010	0.003
Magnesium (Mg)	mg/L	-	-	-	0.245	0.477	0.370	0.788	0.345	0.422	0.321
Manganese (Mn)	mg/L	-	-	≤0.05	0.00225	0.00268	0.00279	0.00265	0.00308	0.00364	0.00330
Molybdenum (Mo)	mg/L	-	0.073	-	0.00125	0.00096	0.00039	0.00084	0.00073	0.00432	0.00118
Sodium (Na)	mg/L	-	-	-	5.94	5.21	5.39	6.26	5.53	3.75	11.7
Nickel (Ni)	mg/L	0.5	0.025-0.15[b]	-	0.0001	< 0.0001	0.0002	0.0002	0.0002	0.0006	0.0003
Lead (Pb)	mg/L	0.2	0.001-0.007[b]	0.01	0.00083	0.00029	0.00043	0.00013	0.00053	0.00046	0.00032
Antimony (Sb)	mg/L	-	-	0.006	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0003
Selenium (Se)	mg/L	-	0.001	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tin (Sn)	mg/L	-	-	-	0.00003	0.00004	0.00003	0.00003	0.00004	0.00002	< 0.00001
Strontium (Sr)	mg/L	-	-	-	0.0105	0.0109	0.0123	0.0190	0.0109	0.0077	0.0037
Titanium (Ti)	mg/L	-	-	-	0.0037	0.0047	0.0118	0.0138	0.0134	0.0185	0.0126
Thallium (Tl)	mg/L	-	-	-	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Uranium (U)	mg/L	-	-	-	0.00940	0.00860	0.00817	0.00277	0.00528	0.00242	0.00143
Vanadium (V)	mg/L	-	-	-	0.00200	0.00268	0.00547	0.0111	0.00557	0.0129	0.00299
Zinc (Zn)	mg/L	0.5	0.03	≤5.0	< 0.001	< 0.001	< 0.001	0.002	< 0.001	0.001	< 0.001

Table 5 Results of Shake Flask Extraction Test (Continued)

	Units	MMER	CWQG (PAL)	CDWQ	10-TR-024 BH10-13 Sand-stone	10-TR-025 BH10-14 Sandy Carbonate	10-TR-029 BH10-15 Carb-onate	10-TR-033 BH10-16 Carb-onate	S449-10 Sand/ Gravel	S454-10 Sand/ Gravel	S458-10 Sand/ Gravel	S461-10 Sand/ Gravel
Sample Weight	g				250	250	250	250	250	250	250	250
Volume mL	D.I. H_2O				750	750	750	750	750	750	750	750
InitialpH	units				9.66	9.52	9.60	9.64	9.46	7.44	9.53	9.31
Final pH	units	6.0 - 9.5	6.5 - 9.0	6.5 - 8.5	9.38	9.11	8.95	9.03	8.94	7.90	9.30	9.27
Mercury (Hg)	mg/L	-	0.026	0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aluminum (Al)	mg/L	-	0.005-0.1[a]	-	0.04	0.23	0.16	0.10	0.04	0.50	0.21	0.25
Arsenic (As)	mg/L	0.5	0.005	0.005	0.0013	0.0003	0.0004	<0.0002	0.0008	0.0003	0.0014	0.0007
Barium (Ba)	mg/L	-	-	1	0.00385	0.00167	0.00170	0.00144	0.00376	0.00406	0.00324	0.00388
Beryllium (Be)	mg/L	-	-	-	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Bismuth (Bi)	mg/L	-	-	-	< 0.00001	< 0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Calcium (Ca)	mg/L	-	-	-	8.32	10.8	12.2	11.4	11.3	4.61	9.28	13.0
Cadmium (Cd)	mg/L	-	0.000017	0.005	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003
Cobalt (Co)	mg/L	-	-	-	0.000039	0.000051	0.000059	0.000054	0.000080	0.000137	0.000045	0.000099
Chromium (Cr)	mg/L	-	0.001	0.051	0.0013	0.0007	0.0006	0.0006	0.0027	0.0014	0.0006	0.0008
Copper (Cu)	mg/L	0.3	0.002-0.004[b]	≤1.0[c]	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	0.0023	0.0015	0.0484
Iron (Fe)	mg/L	-	0.3	<0.3[c]	< 0.002	< 0.002	< 0.002	< 0.002	0.010	0.169	0.004	0.059
Potassium (K)	mg/L	-	-	-	8.56	2.03	2.27	2.51	6.90	0.818	7.14	4.94
Lithium (Li)	mg/L	-	-	-	0.009	0.004	0.005	0.006	0.028	< 0.001	0.004	0.010
Magnesium (Mg)	mg/L	-	-	-	7.40	2.55	2.74	3.71	11.3	1.73	3.42	3.83
Manganese (Mn)	mg/L	-	-	≤0.05	0.00037	0.00030	0.00065	0.00023	0.00064	0.00898	0.00024	0.00165
Molybdenum (Mo)	mg/L	-	0.073	-	0.00073	0.00048	0.00207	0.00069	0.00390	0.00053	0.00177	0.00226
Sodium (Na)	mg/L	-	-	-	0.94	1.38	1.82	1.65	1.85	0.15	4.06	2.35
Nickel (Ni)	mg/L	0.5	0.025-0.15[b]	-	0.0001	< 0.0001	0.0002	0.0001	0.0004	0.0006	0.0002	0.0004
Lead (Pb)	mg/L	0.2	0.001-0.007[b]	0.01	< 0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	0.00079	< 0.00002	0.00015
Antimony (Sb)	mg/L	-	-	0.006	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0013
Selenium (Se)	mg/L	-	0.001	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tin (Sn)	mg/L	-	-	-	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001	0.00006
Strontium (Sr)	mg/L	-	-	-	0.0224	0.139	0.121	0.120	0.0422	0.0073	0.0217	0.0202
Titanium (Ti)	mg/L	-	-	-	0.0003	< 0.0001	0.0003	0.0001	0.0008	0.0111	0.0001	0.0037
Thallium (Tl)	mg/L	-	-	-	< 0.00002	< 0.00002	0.00006	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Uranium (U)	mg/L	-	-	-	0.000234	0.000071	0.000095	0.000107	0.000486	0.000243	0.000974	0.00225
Vanadium (V)	mg/L	-	-	-	0.00494	0.00084	0.00068	0.00042	0.00112	0.00109	0.00456	0.00417
Zinc (Zn)	mg/L	0.5	0.03	≤5.0	< 0.001	< 0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001

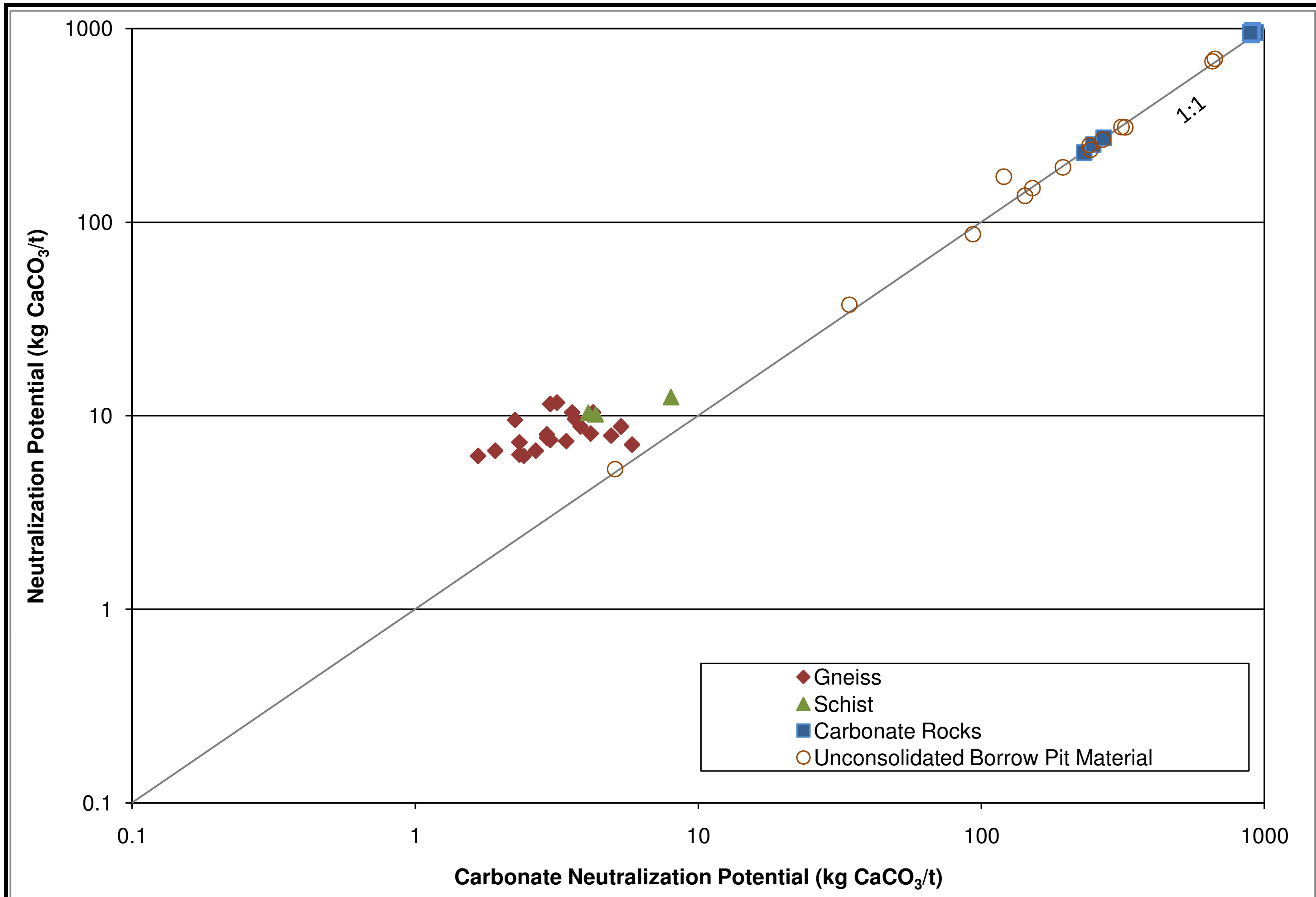
Note:
MMER = Metals, Mining Effluent (SOR 2002 - 222)
Bold values indicate parameters above the MMER value.
** Lab data reported for total chromium.
CWQG (PAL) and CDWQ provided for reference only (see text)
CWQG (PAL) = Canadian Water Quality Guidelines Protection of Aquatic Life, 2007
CDWQ = Health Canada - Canadian Drinking Water Guideline
a) varies with pH
b) varies with hardness
c) Aesthetic objective

Table 6 - Rietveld Quantitative Analysis X-ray Diffraction Results

Mineral/Compound		Ideal Formula	10-TR-001 BH10-4 *granitic gneiss* (wt %)	10-TR-005 BH10-5 *granitic gneiss* (wt %)	10-TR-009 BH10-6 *granitic gneiss* (wt %)	10-TR-014 BH10-8 *granitic gneiss* (wt %)	10-TR-017 BH10-9 *granitic gneiss* (wt %)	10-TR-019 BH10-12 *granitic gneiss* (wt %)	10-TR-035 BH10-12 *schist* (wt %)
Calcite	Carbonates	$CaCO_3$	1.2	0.6	0.1	--	0.3	0.2	--
Rhodochrosite	Carbonates	$MnCO_3$	--	--	--	--	--	0.7	--
Dolomite	Carbonates	$CaMg(CO_3)_2$	--	--	--	--	--	0.5	--
Ankerite	Carbonates	$Ca(Mg, Fe)(CO_3)_2$	--	--	--	--	--	--	--
Quartz		SiO_2	34.4	38.1	34.2	33.6	32.5	30.4	42.6
Albite	Feldspars	$NaAlSi_3O_8$	33.4	30.9	35.0	29.7	36.6	27.7	12.4
Anorthite	Feldspars	$CaAl_2Si_2O_8$	4.2	4.7	5.7	7.4	5.4	8.4	5.7
Orthoclase	Feldspars	$KAlSi_3O_8$	2.5	1.8	1.6	4.5	1.8	2.6	4.1
Microcline	Feldspars	$KAlSi_3O_8$	21.8	20.7	16.5	16.8	16.2	10.8	19.5
Diopside (clinopyroxene)		$CaMgSi_2O_6$	--	--	2.9	2.8	3.1	3.0	4.3
Actinolite (amphibole)		$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$	--	--	--	--	--	9.5	--
Phlogopite	Phyllo-silicates	$KMg_3(AlSi_3O_{10})(OH)_2$	0.4	0.8	3.1	4.3	3.1	5.2	3.4
Biotite	Phyllo-silicates	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$	--	--	--	--	--	--	3.9
Clinochlore (chlorite)	Phyllo-silicates	$(Mg, Fe)_5 (Si_3Al)O_{10}(OH)_8$	1.3	1.4	0.01	0.01	0.01	0.9	4.1
Magnetite		Fe_3O_4	0.8	0.9	0.9	0.9	0.9	--	0.1
TOTAL			100	100	100	100	100	100	100

Mineral/Compound		Ideal Formula	10-TR-024 BH10-13 *carbonate cemented sandstone* (wt %)	10-TR-025 BH10-14 *carbonate* (wt %)	10-TR-029 BH10-15 *carbonate* (wt %)	10-TR-033 BH10-16 *carbonate* (wt %)	S449-10 *borrow material* (wt %)	S454-10 *borrow material* (wt %)	S458-10 *borrow material* (wt %)	S461-10 *borrow material* (wt %)
Calcite	Carbonates	$CaCO_3$	--	99.3	98.9	98.3	22.6	0.2	0.1	2.2
Rhodochrosite	Carbonates	$MnCO_3$	--	--	--	--	--	--	--	0.6
Dolomite	Carbonates	$CaMg(CO_3)_2$	25.9	0.3	0.3	0.6	46.4	--	6.2	11.5
Ankerite	Carbonates	$Ca(Mg, Fe)(CO_3)_2$	--	0.1	0.1	0.3	11.7	--	3.3	3.0
Quartz		SiO_2	56.3	0.3	0.7	0.8	9.7	98.8	33.0	28.5
Albite	Feldspars	$NaAlSi_3O_8$	1.2	--	--	--	1.1	0.7	22.7	25.2
Anorthite	Feldspars	$CaAl_2Si_2O_8$	--	--	--	--	--	--	5.1	3.5
Orthoclase	Feldspars	$KAlSi_3O_8$	1.4	--	--	--	1.3	--	3.9	4.1
Microcline	Feldspars	$KAlSi_3O_8$	15.2	--	--	--	4.6	--	18.3	12.8
Diopside (clinopyroxene)		$CaMgSi_2O_6$	--	--	--	--	--	--	2.8	3.1
Actinolite (amphibole)		$Ca_2(Mg,Fe)_5Si_8O_{22}(OH)_2$	--	--	--	--	--	--	--	--
Phlogopite	Phyllo-silicates	$KMg_3(AlSi_3O_{10})(OH)_2$	--	--	--	--	--	--	3.7	3.4
Biotite	Phyllo-silicates	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$	--	--	--	--	--	--	--	--
Clinochlore (chlorite)	Phyllo-silicates	$(Mg, Fe)_5 (Si_3Al)O_{10}(OH)_8$	--	--	--	--	2.6	0.3	0.5	1.6
Magnetite		Fe_3O_4	--	--	--	--	--	--	0.4	0.5
TOTAL			100	100	100	100	100	100	100	100

FIGURES

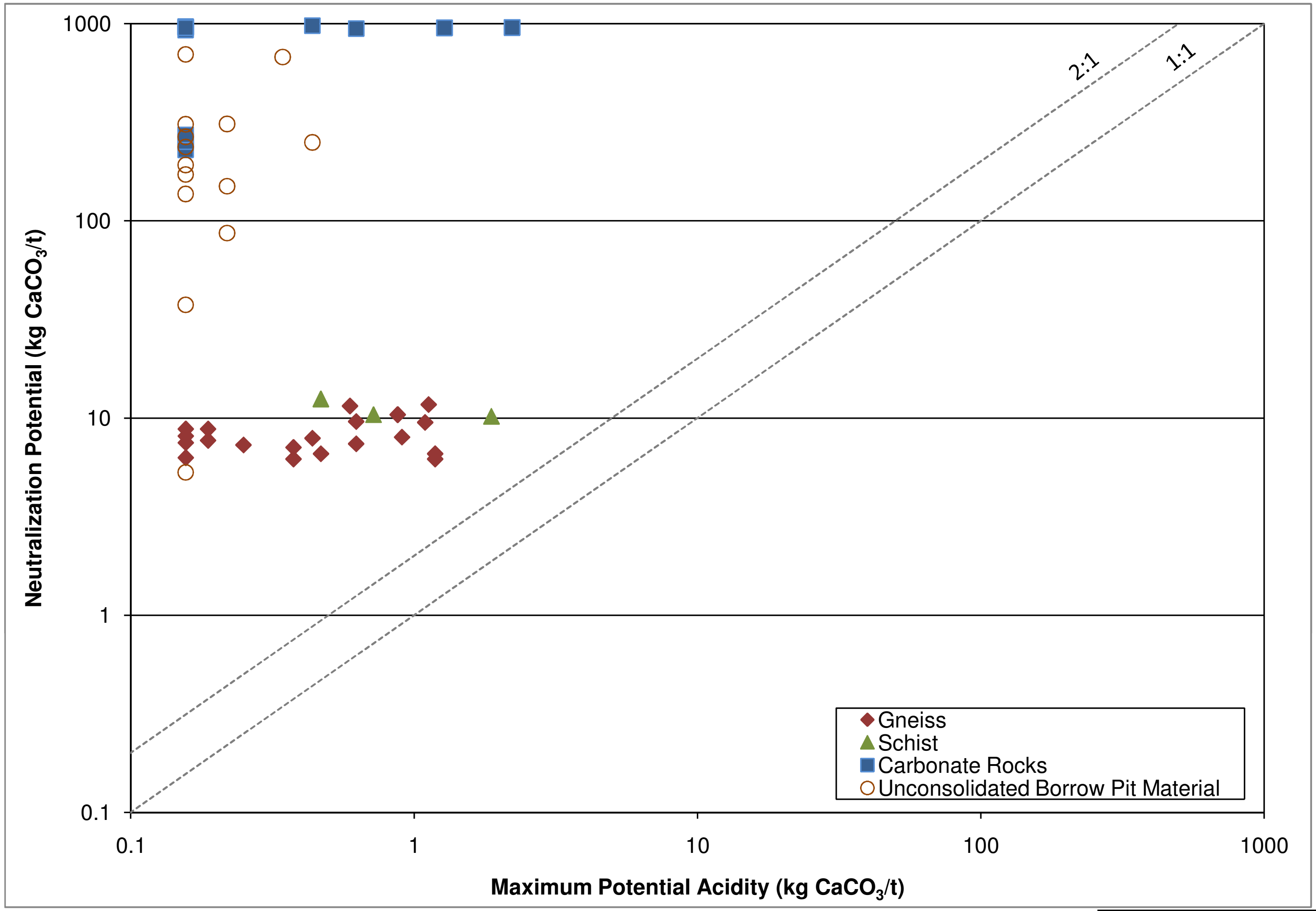


Aggregate Source Material CaNP vs. NP Milne Inlet Tote Road	
Baffinland Iron Mine Corporation	
December 2010	FIGURE 1

Job No. TC101510

Baffinland Iron Mines Corporation

amec



Aggregate Source Material NP vs. MPA Milne Inlet Tote Road	
Baffinland Iron Mine Corporation	
December 2010	FIGURE 2

Job No. TC101510

Baffinland Iron Mines Corporation

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