APPENDIX Q

BLASTING IMPACT ASSESSMENT REPORT

BLASTING IMPACT ASSESSMENT: FUTURE BLASTING OPERATIONS AT THE MOOSE RIVER OPEN PIT GOLD MINE DEVELOPMENT SITE

TOUQUOY GOLD PROJECT
MOOSE RIVER, HALIFAX COUNTY, NOVA SCOTIA

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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) has undertaken an Environmental Impact Assessment (Assessment) of the future blasting operations at the Touquoy Gold Project at the Moose River Gold Mines development (Site) in Halifax County, Nova Scotia. The mine will be operated by DDV Gold Limited (DDV).

The Assessment presented herein provides an evaluation of the potential air blast overpressure and ground vibration impacts from the proposed blasting operations within the open pit mine on sensitive receptors located nearest to the Site. The Assessment was prepared consistent with the Nova Scotia Department of Environment and Labour (NSDEL) *Pit and Quarry Guidelines* (1999).

2.0 SITE DESCRIPTION

The Facility is located at Moose River Gold Mines in Halifax County. The proposed surface footprint of the Site is approximately 300 ha and encompasses the settlement of Moose River Gold Mines, part of a small provincial park and undeveloped forest. It is bounded to the west by the Moose River and surrounded on all other sides by forested land in varying degrees of re-growth due to logging. A Site Plan identifying the surrounding land use is provided as Figure 1.

2.1 SENSITIVE RECEPTORS

All existing residential buildings on the Site have been purchased by DDV, or are in the process of being acquired. Construction will not move forward until all of the lands are under the ownership of DDV. At that time, the nearest receptor will be a point in Scraggy Lake 1,880 metres (m) southeast of the open pit mine, where a camper may be located on a short-term basis. Additional receptors include a children's overnight camp and a residence located approximately 4.3 kilometres (km) and 5 km, respectively, northwest of the open pit mine.

The NSDEL specifies that no blasting operations shall occur within:

- 30 m of the boundary of any public or common highway;
- 30 m of the bank of any watercourse or the ordinary high water mark;
- 800 m of the foundation or base of a structure located off site; or
- 15 m of the property boundary when a structure on the abutting property is not involved.

Based on the Site Plan provided as Figure 1, it can be seen that the open pit mine (where all blasting occurs) is suitably sited to ensure that the above minimum separation distances are maintained.

3.0

QUARRY BLASTING OPERATIONS AND MONITORING

3.1 BLAST DESIGN

The following table summarizes the blast design proposed at the Site:

Holes per blast	100
Explosives (ANFO) per hole	51.7 kg
Holes per delay	4
Blast frequency	1 blast/day Mon – Fri

The NSDEL *Pit and Quarry Guidelines* (1999) specifies that no blasting shall occur on Sunday, a statutory holiday prescribed by the Province, or on any day between the hours of 1800 hours and 0800 hours.

3.2 BLAST MONITOR DATA

There is no historic seismograph information available for this Site.

4.0 EFFECTS AND IMPACTS OF BLASTING OPERATIONS

4.1 GROUND VIBRATION

Ground vibration caused by blasting operations is defined as the speed of excitation of particles within the ground resulting from vibratory motion. The intensity of ground vibrations is measured in units of peak particle velocity. The unit of peak particle velocity is generally measured in millimetres per second (mm/s).

When explosives detonate in a borehole, shock waves (energy from the detonation) radiate outward from the borehole and crush the material adjacent to the borehole. Energy not used in the fracturing and displacement of bedrock dissipates in the form of ground and air vibrations (concussion). Under typical conditions, the blasting vibration intensity diminishes with distance, at a rate of about one third of its previous value each time the distance from the vibration source is doubled.

Some of the factors and parameters that affect the proper fragmentation of the rock and the impacts of blasting include:

- The explosive type, loading densities and weights;
- The detonator delays and firing sequence;
- The decking lengths;
- The spacing of holes;
- The distance between the holes and the free or open face;
- The geology (type and condition) of the bedrock and
- The depth and composition of the earth covering deposit (soil).

The NSDEL *Pit and Quarry Guidelines* provides a maximum peak particle velocity of 12.5 mm/s measured below grade or less than 1 m above grade in any part of the nearest structure not located on the property where the blasting occurs.

Ground vibration is estimated for a specific location using the following equation:

$$\mathbf{PPV = \beta\ (SD)^{\alpha}} \qquad \mathbf{(1)}$$

Where:
PPV = Peak Particle Velocity (mm/s);
SD = Scaled Distance ($m/kg^{1/2}$); and
α and β are site-specific constants based on the geology of the terrain.

Scaled Distance is defined as:

$$\mathbf{SD = D/}w^{1/2} \qquad \textbf{(2)}$$

Where:
D = Distance between the closet blast hole to the receptor (m); and
w = maximum weight of explosive detonated per delay (kg).

The constants, α and β, are site-specific and must be determined by conducting a blast study at the Site. A blast study includes multiple test blasts conducted on-site while measuring particle velocities at varying distances and charge weights for each blast. The resulting data can then be used to create a log-log plot of peak particle velocity versus scaled distance where the slope of the line-of-best-fit through the data is equal to the constant α and the value of the y-intercept is equal to β.

The following figure depicts an example of this type of graph prepared by Lucole and Dowding (1979), with their analysis of over 2500-recorded blasts:

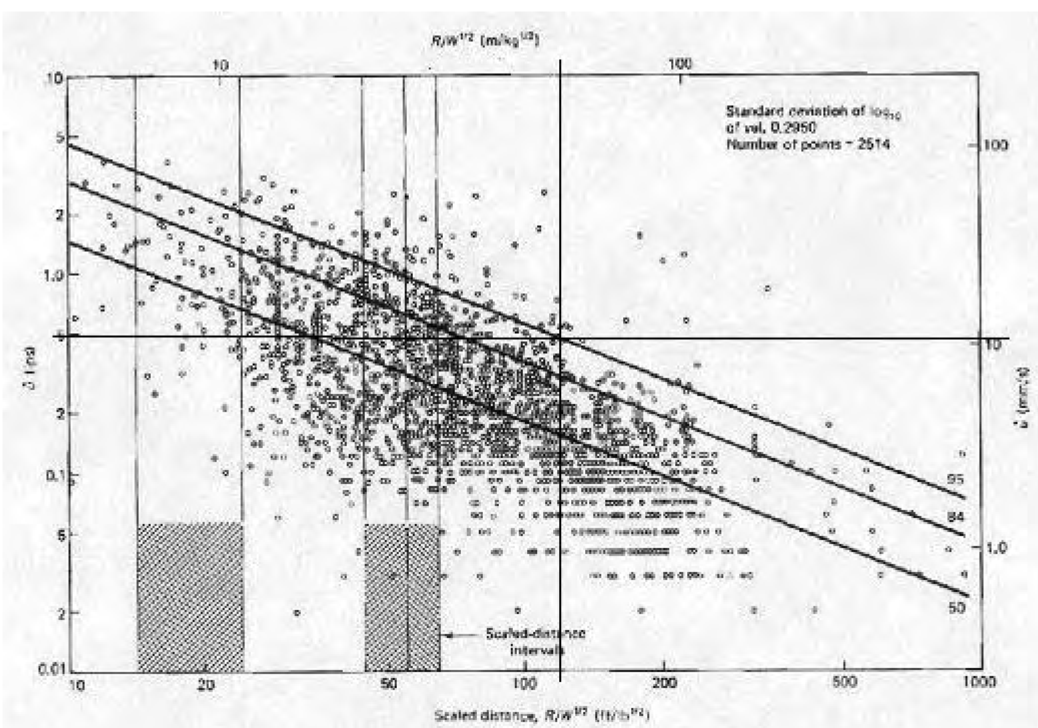


Figure 2 - Variation of particle velocities for blasting in general (resultant values)

Since test blasts have not been conducted at the Site and no seismograph information is available, it is not possible to obtain the site-specific propagation constants, α and β. Therefore, the maximum allowable charge weight per delay may be estimated assuming a minimum safe scaled distance, SD.

Information obtained from the United States (U.S.) Office of Surface Mining provides a minimum safe scaled distance of 70 ft/lb$^{1/2}$ (31.7 m/kg$^{1/2}$) for a maximum allowable peak particle velocity of 0.50 inches/s (12.7 mm/s). Another document, entitled "Technical Engineering and Design Guides as Adapted from the U.S. Army Corps of Engineers, No. 16" from the American Society of Civil Engineers, suggests a minimum safe scaled distance of 50 ft/lb$^{1/2}$ for a maximum allowable peak particle velocity of 2 inches/s (50.8 mm/s). Using the seismograph information from Figure 2, it can be seen that a minimum safe scaled distance for a maximum particle velocity of 12.5 mm/s at the 95 percent confidence level is 60 m/kg$^{1/2}$. Therefore, 60 m/kg$^{1/2}$ was chosen to provide a conservative estimate for the purpose of this evaluation.

Substituting this minimum safe scaled distance into equation (2) and the known separation distance (1,880 m) to the nearest sensitive receptor and solving for w, results in a maximum allowable weight of explosives per delay of 900 kg.

The proposed blast design for the Site utilizes a maximum of 206.8 kg/delay. Therefore, based on this Assessment, there is no potential for adverse effects due to ground vibration to nearby receptors resulting from the blasting operations to be conducted on-site. These calculations do not take into consideration any attenuation measures.

Alternatively, this can be roughly verified using the graph presented as Figure 2 by simply finding the actual scaled distance of 130.7 m/kg$^{1/2}$ on the upper x-axis and locating the corresponding y-axis value using the 95 percent confidence line. The estimated value determined graphically is 5 mm/s. This estimated peak particle velocity is below the NSDEL criteria of 12.5 mm/s.

4.2 AIR BLAST

Another undesirable effect of blasting operations is the generation of air blasts. Air blats cause an atmospheric overpressure that travels through the air. Air blast is increased by exposed detonating cord, lack of sufficient stemming in blast holes, insufficient burden, heavy low-level cloud cover, high winds, and atmospheric temperature inversions.

The overpressure propagates at the speed of sound and has an audible noise level. Thus, air blasts are measured in decibels. Many structures have natural resonant frequencies close to or equivalent to the overpressure wave. This possibility of resonance causes repetitive pressures on the adjacent structures, which produces the vibration effects of ground-transmitted vibrations.

The NSDEL *Pit and Quarry Guidelines* provides a maximum concussion (air blast) of 128 dBA within 7 m of the nearest structure not located on the property where the blasting operations occur.

Air blast is estimated for a specific location using the following equation:

$$\mathbf{APL = \beta\,(SD)^{\alpha}} \qquad \mathbf{(3)}$$

Where:
APL = Air Pressure Level (dBL);
SD = Scaled Distance ($m/kg^{1/3}$); and
α and β are site-specific constants based on the geology of the terrain.

Scaled distance is defined as:

$$\mathbf{SD = D/}w^{\mathbf{1/3}} \qquad \mathbf{(4)}$$

Where:
D = Distance between the closet blast hole to the monitoring receptor (m); and
w = maximum weight of explosive detonated per delay period (kg).

Scaled distances for air blasts are generally calculated by dividing the separation distance with the cube root of the maximum charge weight, as opposed to dividing by the square root of the maximum charge weight when determining the scaled distance for peak particle velocity.

Similar to the procedure for determining the propogation constants for ground vibrations, a blast study measuring overpressure (dBA) with varying distances and charge weights for each blast will provide the required information to generate a log-log plot of maximum overpressure versus scaled distance, where the slope of the line-of-best-fit through the data is equal to α and the value of the y-intercept is equal to β.

The following figure depicts an example of this type of graph, developed by Siskind et al. 1980a, based on the plot of overpressure versus scaled distance.

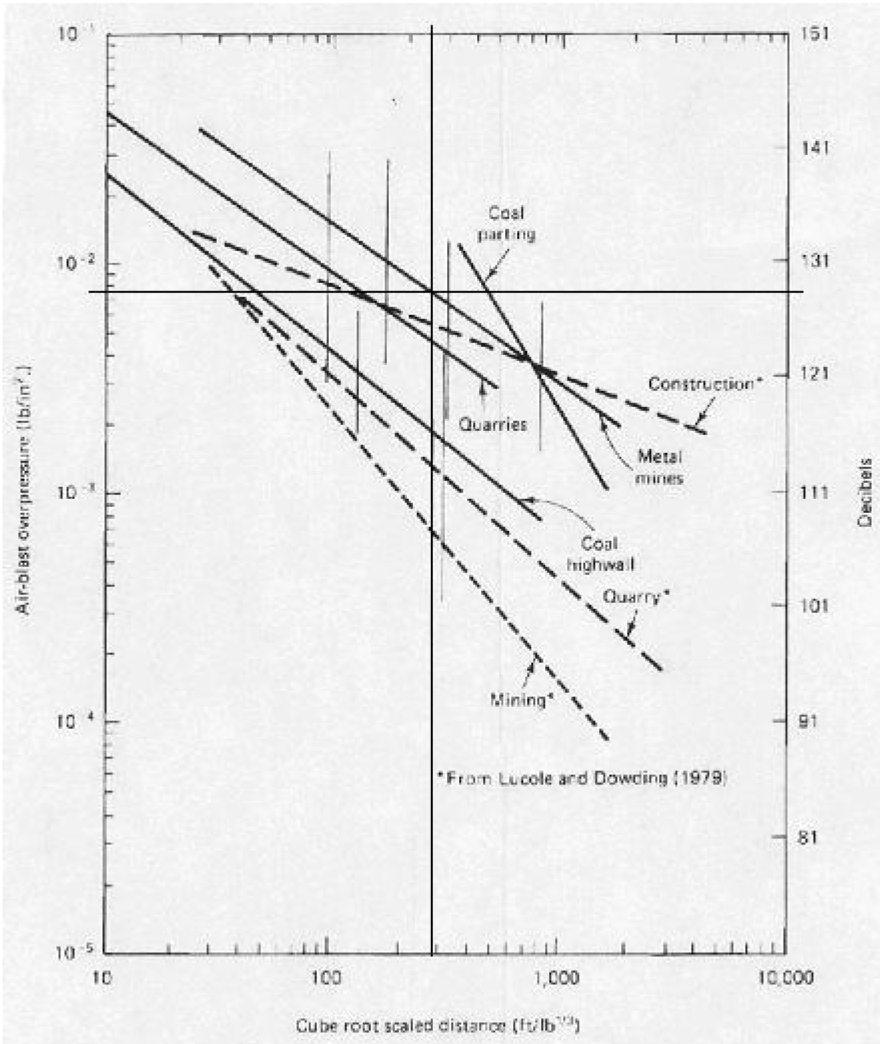


Figure 3 - Air Blast propagation from various types of mining (0.1-Hz high-pass)

Since test blasts have not been conducted at the Site and no seismograph information is available, it is not possible to obtain the site-specific propagation constants, α and β. Therefore, the maximum allowable charge weight per delay may be estimated assuming a minimum safe scaled distance, SD.

The information pertaining to a minimum safe scaled distance when determining air blast is limited. Therefore, using the seismograph information from Figure 3, it can be seen that a minimum safe scaled distance for a maximum overpressure of 128 dBA is observed to be just under 300 ft/lb$^{1/3}$ (119.0 m/kg$^{1/3}$) for the metal mines graph. The metal mines graph was selected to provide a conservative estimate of the minimum safe scaled distance. As a conservative estimate, 300 ft / $lb^{1/3}$ (119.0 m / $kg^{1/3}$) was used as the minimum safe scaled distance (SD) for the purpose of this evaluation.

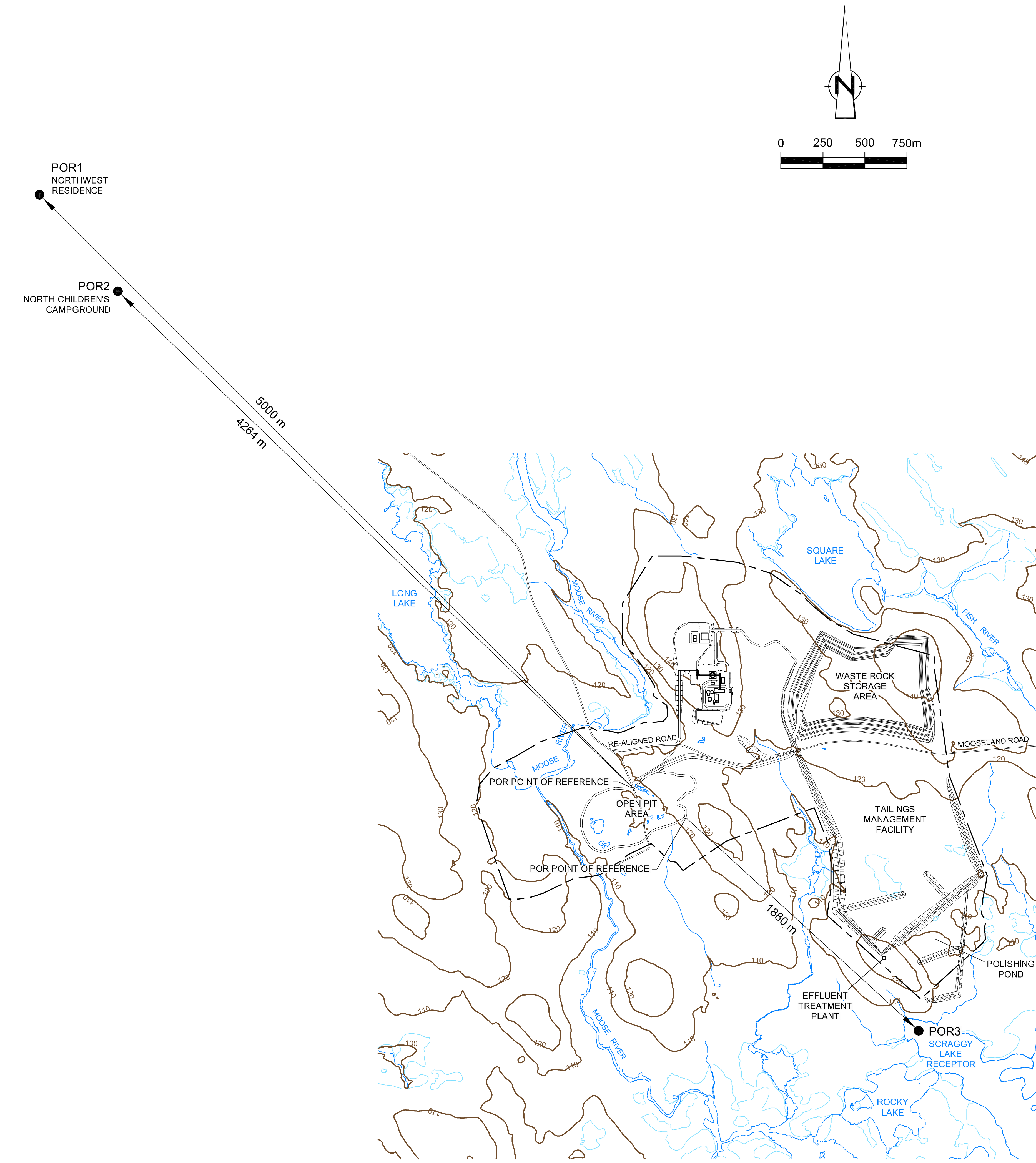
Substituting this minimum safe scaled distance into equation (4) and the known separation distance to the nearest sensitive receptor (1,880 m) and solving for *w*, results in a maximum allowable weight of explosives per delay of approximately 3,900 kg.

The proposed blast design for the Site utilizes a maximum of 206.8 kg / delay. Therefore, based on this Assessment, there is no potential for adverse effects due to air blast on nearby receptors resulting from the blasting operations to be conducted on-site. These calculations do not take into consideration any attenuation measures.

Alternatively, this can be roughly verified using the graph presented as Figure 3 by simply finding the actual scaled distance of 800 ft / $lb^{1/3}$ (317.9 m / $kg^{1/3}$) on the lower x-axis and locating the corresponding y-axis value using the metal mines graph line. The estimated value determined graphically is approximately 122 dB. This estimated air blast overpressure is below the NSDEL criteria of 128 dBA.

5.0 CONCLUSION

The results from this Assessment indicate that the proposed blasting operations at the Site will be in compliance with the NSDEL *Pit and Quarry Guidelines* (1999) based on the worst-case estimates described in Sections 4.1 and 4.2.



LEGEND

SITE BOUNDARY

POR2 POINT OF RECEPTION

figure 1

SITE AND POINT OF RECEPTION PLAN
VIBRATION IMPACT ASSESSMENT
TOUQUOY GOLD PROJECT
Moose River, Nova Scotia

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APPENDIX R

GEOCHEMICAL STUDY

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REPORT ON

GEOCHEMICAL STUDY
STATIC AND KINETIC TESTING OF WASTE ROCK AND TAILINGS
TOUQUOY PROJECT
NOVA SCOTIA, CANADA

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EXECUTIVE SUMMARY

A geochemical characterization program was undertaken for Atlantic Gold NL (Atlantic) for the Touquoy Project. The current mine plan calls for extraction of gold ore by open pit mining. The Touquoy site is located in Moose River Gold Mines region of Halifax County in the central part of Nova Scotia, Canada, approximately 140 km northeast of Halifax. The primary objective of the geochemical characterization program is to provide sufficient data for chemical stability evaluation of the various materials expected to be produced in mining and mineral processing.

The testing program described in this report was designed to evaluate the metal leaching potential and acid generating capacity of the waste rock, marginal ore and tailings that may be deposited on site. The characterization of the mine wastes was completed using samples selected to represent specific rock types, and to evaluate the deposit characteristics on a scale that is relevant to the proposed mining operations (e.g. in addition to specific rock-type samples, composite samples over the expected open pit bench height intervals are used in the assessment). The geochemistry test work includes both short term (static) and long-term (kinetic) tests to determine the chemical stability of these materials. The implications of these results with respect to the Touquoy Project are discussed, as are possible mitigation measures.

Results show that with respect to acid generation, the Touquoy site is significantly different from other maritime mining projects such as Voisey's Bay, or from around Halifax. The rock sequences at Touquoy do not contain the massive sulphides of a Voisey Bay type deposit, nor do they contain the sulphide rich slates of the Halifax Formation which are responsible for ARD at the Halifax Airport. Overall sulphide contents at the Touquoy project are low.

Only a small proportion of the potential waste materials from the proposed Touquoy project are acid generating (2% based on samples collected to date), and given that the majority of buffering minerals are carbonate minerals for which excess neutralization potential is readily available, it is considered that overall the waste materials from the Touquoy project will be non acid generating with excess neutralizing capacity. Additional evidence that AG will not be prevalent is available from the net acid generation testing completed as well as the bulk sample pit on site. The water quality from this pit remains neutral after several years exposed to the environment (Atlantic 2007 – pers. Com with Peter Carter).

Results of the trace metal analyses and leach test results indicate arsenic is the main parameter of concern for the Touquoy project. With respect to water quality values, based on the short term testing, NAG test results, and humidity test cell results, overall, values of long term and short term leachate for most parameters are neutral with low concentrations of dissolved parameters relative to other mining properties. Although some parameters (e.g. Al, As, Zn) are elevated in the short term and longer term leach testing it is important to keep in mind that these values must be taken in the context of the overall site water quality and potential site discharge. Evaluation of these parameters is currently underway as part of an overall site water quality model.

Based on the results and conclusions as presented herein recommendations are as follows:

- As opportunity presents itself (as infilling drilling occurs) a few additional confirmation samples of fresh rock in the western zones of the pit should be collected and analysed for sulphide content. Should the pit design change, the sample set and analytical results will need to be reviewed to determine if supplementary collection and geochemical characterization of samples is required.

- Monitoring should include periodic evaluation of conditions on site with respect to visual indicators of acid generating conditions such as ferric hydroxide precipitation on the waste materials and in water courses or streams.

- Monitoring of water quality form the site and tailings should be conducted regularly during operations and for a period after closure.

- Management strategies for waste rock and tailings should be re-evaluated periodically during operations and adjusted or updated if necessary based on the results of the monitoring data.

Should acid generation be observed in the materials on the surface of the pile, it is considered that the overall NP of the pile will limit vertical migration of acidic conditions in the pile. Mitigation/remediation of these small areas of the pile would involve relocation of the acid generating materials, within areas of the pile that are non-acid generating, or covering the materials to maintain clean surface runoff and limit oxidation of the materials.

It is recommended that appropriate treatment options for arsenic and other parameters be implemented if deemed necessary once an evaluation of overall site water quality is completed. This overall water quality evaluation, and an evaluation of treatment options is currently underway.

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1.0 INTRODUCTION

This report provides information regarding the geochemical characterization of the Touquoy Gold deposit in the Moose River Gold Mines district of Nova Scotia, Canada. Golder Associates (Golder) was retained by Atlantic Gold NL (Atlantic) to provide a geochemical characterization of the anticipated mine waste materials at the Touquoy property in support of Feasibility Studies, currently in progress.

1.1 Background Theory Regarding Geochemistry of Mine Waste

In mining operations, the natural weathering of soils and rock is typically accelerated as these materials are disturbed and exposed to the atmosphere. This enhanced weathering may result in impacts to water resources (i.e., groundwater, surface water). It is therefore necessary to evaluate the quantity and composition of possible runoff and leachate from the disturbed material to assess the potential implications to mine design and the environment. The results may influence the mine plan and may have ramifications with respect to the overall acceptance by the appropriate regulatory agencies. If a potential problem is identified, mitigation measures can often be developed to prevent, reduce or eliminate the impact.

During geochemical evaluation of mine wastes the presence or absence of sulphide minerals is important to note, since environmental impacts of most concern are commonly those associated with the presence of reactive sulphide minerals. When sulphides are exposed to the atmosphere, they have the potential to react with oxygen and water to produce acid rock drainage (ARD). The resulting acidity may then be neutralized by minerals that contain buffering capacity. Also important to note in the evaluation is the presence of carbonate minerals or other buffering minerals since carbonate minerals are generally the most effective in counteracting acidic conditions, but other minerals (e.g., silicates) may contribute as well. If insufficient buffering minerals are present, significant quantities of acidity, sulphate and metals may be released from the mine wastes.

In addition to evaluation of acid generation, metal leaching must also be assessed since metal leaching can also occur in the absence of reactive sulphides under non-acidic conditions due to dissolution of soluble mineral phases. Release of nutrients (e.g., ammonia, nitrate) may take place due to the presence of residual explosives and is also of interest in the geochemical evaluation.

1.2 Scope of Work - Geochemistry

The primary objective of the geochemical characterization program is to provide sufficient data for chemical stability evaluation of the various materials expected to be produced in mining and mineral processing. This evaluation will allow for comparisons to be made with existing environmental conditions so that the potential for environmental impacts can be evaluated.

Other specific objectives of the baseline geochemistry program include:

- Development of a defensible geochemical database sufficient for mine planning and decision making purposes;
- Development of estimates of the potential for ARD and metal leaching for use in site water quality assessments; and,
- Development of appropriate data to support decisions related to environmental management strategies, material handling strategies or mitigation measures, as required.

The testing program described in this report was designed to evaluate the metal leaching potential and acid generating capacity of the waste rock, marginal ore and tailings that may be deposited on site. The characterization of the mine wastes was completed using samples selected to represent specific rock types, and to evaluate the deposit characteristics on a scale that is relevant to the proposed mining operations (e.g. in addition to specific rock-type samples, composite samples over the expected open pit bench height intervals are used in the assessment).

The geochemistry test work includes both short term (static) and long-term (kinetic) tests to determine the chemical stability of these materials. The implications of these results with respect to the Touquoy Project are discussed, as are possible mitigation measures and follow-up work that should be considered as the project progresses into operations.

The geochemistry work included and discussed in this report was initiated in Mid-2006 with completion of an on-site sampling program. M. Herrell of Golder Associates visited site and reviewed available drill core to select samples to be representative of potential materials from the deposit under the direction of K. DeVos of Golder Associates. Following selection of samples a static test program was initiated with results presented in December of 2006. Following completion of the static test program 10 waste rock samples of various lithologies were selected for longer term kinetic testing to evaluate potential changes in chemistry over time. Results for the initial 20 weeks of testing are included in this report as are available results for tailings samples as provided by SGS Lakefield in Ontario, Canada, under the direction of Atlantic's metallurgist, Sydney-based Peter Lewis and Associates.

2.0 BACKGROUND GEOLOGY AND PROJECT DEVELOPMENT

2.1 Project Overview

The project overview and background geology as summarized below is based on the draft project description (Atlantic, 2006a) and discussions with Atlantic Gold personnel. The Touquoy Gold deposit is located approximately 140 km northeast of Halifax in the Moose River Gold Mines district in the Halifax County, Nova Scotia, Canada. The proposed site lease area is 320ha, with a proposed approximate footprint of 265 ha. The Touquoy site is mainly characterized by low-relief and hummocky topography. The site is located inland, sheltered from the immediate effects of the Atlantic Ocean, such that climate conditions are characterized by warmer summers and cooler winters. A Meteorological Service of Canada climate station (ID#8203535) is located approximately 15 kilometres from the site location near Middle Musquodoboit. A 35 year climate record from 1968-2003 indicated monthly temperatures vary from -6.2°C in January to 18.4°C in July and average monthly precipitation varies from 97 mm in June to approximately 138 mm in December.

Based on the Atlantic 2006 project description, ore will be extracted through an open pit operation with an anticipated mine life of 5 to 7 years and a mill capacity of 4,000 – 5,000 tpd. The Touquoy property has an estimated total resource of approximately 9.76 Mt at a grade of 1.8 g/t and is expected to yield approximately 554,500 oz gold. The ore is disseminated throughout the sedimentary host rocks and is visually indistinguishable from waste materials. During operations, the ore will have to be delineated through grade control drilling for each bench as the pit evolves (Atlantic, 2006a).

The project description indicates that gold will be removed from the ore in a process involving the following two stages: gravity concentration and carbon-in-leach (CIL) procedure. Tailings produced during process with be detoxified using the INCO SO_2/Air procedure before being deposited as a slurry at approximately 50% solids into the tailings management facility (TMF).

2.2 Background Geology

The Touquoy deposit is formed in the Meguma Group sediments of Nova Scotia. Meguma Group sediments consist of a series of greywacke and argillite sedimentary rocks underlying approximately half of the province of Nova Scotia. Two main lithological units occur at the Touquoy Project: argillite and greywacke. Varying degrees of interbedding occur within these two units and the above can be further subdivided as follows:

- Argillite (<5% greywacke interbeds)
- Argillite (5-49% greywacke interbeds)
- Greywacke (<20% argillite interbeds)
- Greywacke (20-50% argillite interbeds)

Minor quartz veining is also present in the Touquoy deposit; however, unlike the majority of gold deposits in Meguma sediments, mineralization at Touquoy is found disseminated throughout the sediments and is not associated with quartz veining. Of note is that the deposit does not encounter the slates of the Halifax Formation which contribute to much of the acid generation issues in Nova Scotia.

The bedrock geology is overlain by approximately 3 metres of glacial till. The overlying sediments are mainly composed of quartzite with drumlins composed of local and foreign materials. The quartzite is described by Atlantic (2006a) as bluish-grey, loose, cobbly silt-sand till which grades into a sandier, coarser till with occasional clay inclusions.

Topsoil at the Touquoy site is part of the Danesville and Wolfville series and primarily consists of loams to sandy loams and sandy clay loams with some gravely and stony areas.

Table 1 outlines the initial percentages of the waste rock, ore and tailings materials expected to be encountered during mining (Atlantic, 2006b). These tonnages formed the basis of waste rock distribution. It should be noted that the percentages of each lithology are based on the estimated distribution of ore among the various lithologies and the waste rock to be extracted during operations is also considered to be distributed in the same proportion (Atlantic, 2006b).

2.3 Rock/Overburden Use

All rock types are anticipated to be directed to the waste rock storage facility (WRSF) unless designated as ore. Topsoil will be stockpiled for later use in site reclamation activities or used in the construction of an annular safety berm approximately 30m outwards from the open pit. The underlying till will also be used in the construction of the safety berm and in the construction of other site infrastructure such as tailings dam embankments and for site levelling.

3.0 METHODS

3.1 Sample Selection

Waste Rock

Waste rock sample selection was conducted to meet the following objectives:

- Identify the major waste rock units and those units that will potentially be exposed on the open pit surface and in the waste rock disposal area(s); and
- Collect samples from these units that are spatially and compositionally representative of each rock type.

During the site visit, a review of the background data (geologic and design information) was conducted to develop an understanding of site components and lithologic units/alteration types that might affect the overall geochemistry of the site. Consultation with site personnel in addition to reviewing logs, cross sections and core made available, aided in the identification of major lithologies. The following prevalent lithologies types were identified:

- Argillite (<5% greywacke interbeds)
- Argillite (5-49% greywacke interbeds)
- Greywacke (<20% argillite interbeds)
- Greywacke (20-50% argillite interbeds)
- Massive quartz veins
- Argillite and greywacke composites.

The massive quartz vein is defined as an individual unit when it present for at least 50% of a one meter drill interval (Diamond Ventures NL, 2004). The argillite and greywacke composites represent sections of core where the lithology was too variable over the sample interval that no one lithological classification could be used. Composite samples were collected in areas of the pit where the composite lithologies are expected to contribute significantly to the waste rock.

In order to obtain samples of the different rock types to be encountered, Golder used the available cross-sections to evaluate rock type distribution. Samples were targeted within a preliminary pit outline (Mining Solutions Consultancy Pty Ltd., 2006) available as a trace on the cross-sections. Older core from the western area of the proposed pit was not sampled since it had been exposed to weathering on surface for some time.

The sample list was generated based on cross-sections from the central portion of the pit and the margins of the pit. A visual estimate of the lithology from the cross-sections was used as a guide to collect samples in proportion to the distribution of the various lithologies. These proportions will be checked for representativeness after the finalization of the mining sequence plan, Based on the review of drill logs and the cross sections provided it is expected that the existing samples provide a good overview of potential conditions in the overall pit, including the western portion of the pit, however during future in-fill drilling programs it is recommended that a few confirmation samples from this area of the pit be collected and evaluated for sulphide content.

Samples were selected across the length and depth of the intended pit to obtain spatial variability to the extent possible using available core. Drillholes selected from the cross-section were sampled at length from near surface to near the pit bottom to provide a depth distribution. In general, samples were comprised of 10-m intervals of core. This interval length was chosen to mirror a typical bench height that might be used during open pit excavations.

Marginal Ore

In addition to waste rock sampling, marginal ore samples were also collected on site for geochemical characterization material that could report to the marginal ore stockpile. It was determined on site by Atlantic personnel that marginal ore would be defined by grades ranging from 0.7 to 0.9 g/t (Atlantic, 2006c). The geologic sections were reviewed to target continuous sections of core with grades in the range of 0.7 to 0.9 g/t trying to maintain an average grade of approximately 0.7 to 0.8 g/t. Occasionally, rock with grades >0.9g/t or <0.7g/t were included in some of the targeted lengths since it is expected that this material may also end up in the marginal ore pile. Marginal ore samples were identified over an appropriate interval which would maintain the marginal gold grade average.

Tailings

Two tailings samples were provided for geochemical testing. Initially, a master-composite head sample provided by Atlantic was leached and detoxified by SGS Lakefield in Ontario, Canada, under the direction of Atlantic's metallurgist, Sydney-based Peter Lewis and Associates to produce a tailings sample (CND 2) reported to be representative of the expected process by-product at the Touquoy site (Lewis, 2006). Due to the expected homogeneity of the Touquoy deposit, only one tailings sample was prepared to represent the tailings materials that will be produced during operations (Lewis, 2006). Following analyses of this sample, and discussions with Atlantic Gold and their metallurgists it was determined that additional samples would be required for evaluation of cyanide degradation rates, and to help assess potential variability in tailings materials, hence materials for a second tailings sample were shipped to SGS Lakefield. These materials were analysed for static test parameters and a second tailings sample "CN1 CND1-7" was prepared using the "TWB" material from the "western section bottom" of the pit, as this was expected to be the last material that would be removed from the pit. The tailings sample was prepared for testing by SGS Lakefield under the direction of Peter Lewis and Associates.

3.1.1 Sample Collection

Waste Rock & Marginal Ore

Once a final list of samples was assembled, lengths of core from the identified boreholes were retrieved from storage and laid out. Golder personnel then reviewed the core to evaluate the sample lithology visually relative to the core record. Waste rock samples were collected over approximately 10-m intervals. Some intervals were shorter, depending on the overall condition of the core and core recovery.

Two to three kilogram samples were collected comprising several smaller sub-samples (approximately 10-cm lengths) collected at regular intervals (approximately at each metre) across the length of each sample. The sub-samples were visually representative of the sub-interval from which they originated. Samples were placed in bags and were clearly labelled with a unique sample number in indelible marker. The bags were sealed and samples were then gathered into larger bags and labelled with shipment details. As samples were removed from the core, the core box was marked to indicate where the sample was removed. All samples were shipped from site to the analytical laboratory in Lakefield, Ontario (SGS Lakefield).

A total of 83 waste rock and 11 marginal ore samples were collected. Initially 84 waste rock samples were targeted but, based on a review of the average gold grades in the samples, one waste rock sample (06-008) was more representative of material that may be classified as marginal ore. This sample had grades ranging from 0.012 to 2.01 g/t with an average of 0.62 g/t. Table 2 provides a summary of waste rock and marginal ore samples collected from the site.

Tailings

A wet head sample to be leached and detoxified was initially shipped directly by Metcon Laboratories in Australia to the analytical laboratory, SGS Lakefield, in Lakefield, Ontario, Canada in 2006 for tailings testing. The resulting leached sample was labelled "CND2" and was subjected to environmental testing as reported herein.

Following discussion with Atlantic Gold a second tailings sample was prepared. On March 6th SGS Lakefield received from Metcon Labs in Australia 1kg each of samples labelled TWT, TWM, TET and TEB which represent the different zones of the proposed pit. These samples were subjected to the static testing. Also received was a sample of approximately 20kg labelled TWB (or TWB CN Feed) which represents material from the lower western section of the proposed pit. This sample was subjected to the same static tests which were completed prior to CN detox work.

The 20 kg TWB sample was then used by the SGS Lakefield metallurgical group for cyanide destruction/detox (CND work). Various tests are run during the detox process and samples from these tests were labelled as CND1, CND2, CND3, with a final completed tailings sample generated and labelled "CN1 CND1-7". Static testing was completed on this sample as was a 45 day age test. Humidity cell testing of this sample is currently underway.

Table 2 summarizes the details of these samples.

3.2 Laboratory Testing Methods

Selected samples were submitted for static testing and longer-term kinetic testing, and the tailings samples were submitted for kinetic testing. These tests are summarized below. Additional details on these test procedures are provided in Price (1997), MEND (2005) and in ASTM (2001). The geochemical testing was conducted by SGS Lakefield Research in Lakefield, Ontario.

3.2.1 Static Testing

Static tests are "one-time" analyses used to determine the general geochemical characteristics of a sample. These tests are typically the first step in the assessment and prediction of acidic drainage and metal leaching. For an individual sample this testing might comprise a combination of the following:

- Elemental Analysis on Solids and/or Whole Rock Analyses – used to determine the total amount of metals in the solid phase of the rock samples;

- Mineralogy – used to identify mineral assemblages as they have a large influence on acid generating and buffering reactions.

- Modified Acid Base Accounting (Modified ABA) – used to develop estimates of the potential for acid generation based on the balance between acid producing and acid buffering minerals;

- Short-Term Leach Testing – used to develop initial estimates of metal leaching from weathered materials; and,

- Net Acid Generation tests – used to estimate the acid generation potential and water quality resulting from the complete oxidation of all sulphide minerals and dissolution of all neutralizing phases in a sample. NAG test leachates represent possible late stage (or terminal) water qualities that are environmentally conservative.

Modified ABA

Acid-base accounting (ABA) testing was conducted to determine the acid generation potential of the waste rock and tailings. ABA testing included the following parameters:

- Paste pH;
- Sulphur species (including total sulphur, sulphide sulphur and sulphate);
- Neutralization potential (NP) by the modified Sobek method;
- Carbonate NP (CaNP) by carbon dioxide analysis; and
- Calculation of acid potential (AP), net neutralization potential (NNP), neutralization potential ratio (NPR, or NP/AP), and carbonate neutralization potential ratio (CaNP/AP).

ABA is used to determine the balance between the acid-generating potential (AP) and acid neutralizing potential (NP) of a particular material. There are a number of standard protocols used for the determination of ABA as summarized in Price (1997). For this characterization, a modified Sobek method was used (based on Sobek et al., 1978). Rather than calculating an AP based on total sulphur, the AP is calculated using sulphide-sulphur. This assumes that all the sulphide sulphur is present as pyrite and that each mole of pyrite generates four moles of hydrogen ions upon oxidation. This assumption is supported by the mineralogical characterization performed by SGS Lakefield (Appendix D). Using sulphide sulphur instead of total sulphur values avoids the over-estimation of the AP that may occur by incorporating other oxidized, non-reactive forms of sulphur.

The NP is generally determined by sample acidification with sulphuric acid and back-titration to identify acid consumption as described in Sobek et al. (1978). A common alternative method for the estimation of NP makes use of carbonate analysis. On the assumption that all carbonate represents calcite [$CaCO_3$] (Appendix D), a conversion is performed to calculate the amount of calcite. This form of NP is thus referred to as carbonate neutralization potential (CaNP). Use of CaNP is considered to be a more conservative measure of available neutralizing potential than the "bulk" NP Sobek methods. In many cases, the Sobek method has been shown to overestimate available neutralizing capacity due to the dissolution and subsequent acid consumption by silicate minerals during the test. However, under ambient conditions, dissolution of silicate minerals is generally too slow to provide effective buffering capacity, and only the readily-available CaNP is released.

Paste pH is a test to measure the pH that a sample generates upon contact with water. The pH is measured in a paste formed by mixing water and a crushed rock sample (Steffen et al., 1989). This test is a qualitative indicator of the capacity of the sample for the immediate dissolution of calcium carbonate as well as the presence of stored acidity.

A number of criteria have been proposed for assigning an ARD potential to a material using ABA results. The most common approaches are those based on the use of the neutralization potential ratio (NPR = NP/AP). For several reasons, no single ratio of NPR values has been identified to have universal applicability with respect to acid generation prediction. The actual threshold values for a particular solid are material specific, and depend on factors including the amounts and type of acid generating and neutralizing materials, morphology, crystallinity, grain size, chemical composition, paragenesis, texture and site-specific exposure conditions.

For the purpose of this study, acid generation potential (AP) was calculated using sulphide-sulphur (modified Sobek method). Sulphide-sulphur is used for this purpose, as it is considered to represent the reactive sulphur component. NPR guidelines suggested by Price (1997) are summarized below:

Potential for ARD	Criteria	Comments
Likely	NPR <1	Likely acid generating, unless sulphide minerals are non-reactive.
Uncertain	1< NPR <2	Possibly acid generating if NP is insufficiently reactive or is depleted at a rate faster than sulphides.
Low	2< NPR <4	Not potentially acid generating unless significant preferential exposure of sulphides along fractures planes, or extremely reactive sulphides in combination with insufficiently reactive NP.
None	NPR >4	Not expected to generate acidity

In addition, the relationship between paste pH and sulphide-sulphur content was considered. Materials with a sulphide-sulphur content of less than 0.3 wt.% and a paste pH greater than 5.5 may be classified as non-acid generating (Price, 1997) except where the rock matrix consists of base poor minerals (e.g., quartz), or where the sulphide minerals contain metals that may leach under weakly acidic to alkaline conditions.

Net Acid Generation

NAG testing was performed on a sub-set of samples. Samples were selected for NAG testing based on ABA results. The purpose of NAG testing was to assist in evaluating the long term acid generation potential of these rock types. The test uses hydrogen peroxide to accelerate sulphide oxidation. The neutralizing minerals dissolve in response to the acidity released during sulphide oxidation. Since the acid generating reactions go to completion the results of NAG tests are considered to be indicators of longer term pH, water quality and acid generation potential.

Elemental Analysis

Elemental analysis was performed to determine the solid-phase content of most metals in a material or the reservoir of an element in the material, to characterize the chemical composition of the rock samples. Two analytical methods were used. XRF was used to quantify the major oxide content of the rock and ICP was used to quantify trace metals.

The elemental composition provides a basis for comparison between and within lithologies. In addition, if necessary, element data can be used in conjunction with results from leach tests to develop predictive, quantitative relationships between metal content and leaching rate. Results were also compared to average crustal abundances as presented in Price (1997).

Short-Term Leach Testing (Modified SPLP)

Short-term leach tests are primarily used as a screening tool for qualitative identification of elements of potential environmental concern and to evaluate the extent of weathering of the core. The results of this type of testing do not translate directly to the expected environmental behaviour of the rock because of the small size of the test, the reduced grain size of the materials, the short duration, and the enhanced contact between the liquid and the solid test charge during the test.

The short-term leach test utilized in this characterization program was a modified version of the U.S. EPA Method 1312 Synthetic Precipitation Leach Procedure (SPLP) (U.S.EPA, 1998). The modification involved the use of a water to rock ratio of 4:1 (by weight) rather than the standard ratio of 20:1. This was done to reduce the possibility of inadvertently diluting solutes to concentrations below their respective detection limits. A 100 g of solid sample was mixed with 400 mL of a dilute sulphuric/nitric acid solution at a pH of 5. The sample container was then rotated end-over-end in an agitator for 18 hours after which, the leachate samples were collected, filtered and analyzed using ICP-MS.

Results of short-term leach tests are very sensitive to the methodology and can therefore exhibit considerable variability related to the specific test methodology used. As such, the SPLP test does not represent field conditions. In particular, the solid to solution ratio can have a profound effect on leachate composition, and anticipated relationships between the degree of dilution and leachate quality are rarely observed. In addition, the SPLP simulates metals leaching by simple dissolution of readily-soluble mineral phases in response to a single, natural precipitation event (e.g., a "first flush" event). The test is therefore not intended to simulate transient conditions and reactions, such as sulphide oxidation. To assess reaction rates and long term conditions, results from the laboratory kinetic tests are typically used.

Despite these limitations, results from the SPLP test are useful in that they provide a first indication of elements of potential environmental concern. However, since the leachate compositions cannot be directly related to full-scale, ambient operational or post-closure conditions they should not be quantitatively compared to water quality guidelines.

Mineralogy

Mineralogy is a controlling factor in the geochemical behaviour of a material. For example, iron identified in the trace metal analysis may occur in acid generating pyrite, or acid neutralizing calcium-iron carbonate, or some other form of oxide. Mineralogy testing is performed to better understand the composition of the material.

3.2.2 Kinetic Testing

Kinetic tests are repetitive leach tests on a representative sample designed to evaluate potential material reactivity, mass loading and/or leachate water quality of the sample over time.

Laboratory Humidity Cell Tests

A humidity cell is a weathering chamber designed to provide simple control over air, temperature and moisture, while allowing for the removal of weathering products (principally oxidation products) in solution. For the laboratory testing, a standard humidity cell procedure as described in ASTM D5744-96 Standard Test Method for Accelerated Weathering of Solid Materials Using a Modified Humidity Cell (ASTM, 2001) is used. This type of laboratory testing also provides the fundamental data necessary to complete a preliminary evaluation of reaction rates for acid generating minerals, reaction rates for neutralizing minerals, metal leaching rates, mass loading rates and possible water quality implications.

The standard humidity cell test requires approximately 1 kg of sample (ASTM, 2001). Prior to placement in the test cell, the sample is wetted, flushed, and rinsed. This is followed by a weekly cycle of dry air, humid air, and flushing. The flushing takes place by adding 500 mL of the lixiviant to the top of the cell and allowing it to soak the samples for a specified period. The leachate resulting from the flushing is filtered and analyzed for a limited set of standard parameters on a weekly basis, as well as for a more comprehensive suite of analytes at greater time intervals.

Humidity cell tests have been completed for 11 samples in total: 1 tailings sample, and 10 waste rock samples. Humidity cell testing on one additional tailings sample is currently underway.

Tailings Supernatant Age Testing

The purpose of the ageing test analyses is to describe the natural attenuation of various parameters through time and to quantify the water quality of the process water being discharged to the tailings management facility. Tailings supernatant water, generated during leaching and detoxification of the ore head sample, is retained and scanned over time, generally on the following days: 0, 3, 7, 14, 31 and 45 for selected parameters.

4.0 RESULTS

This section presents the results of the static and kinetic test analyses for the Touquoy deposit. Detailed results from static testing are provided in Appendix A. Results from the kinetic test work are provided in Appendix B.

4.1 XRF and Trace Metals

The composition of the samples as determined by the XRF results and trace metals analyses are summarized in Tables 3 and 4. Histograms showing the distribution of metals for each rock type are presented in Figure 1 and 2. The squares on the figures represent static test results from the samples selected for short-term leach and kinetic testing.

Average elemental compositions of the principle rock types are similar as is expected in turbidite depositional sequences such as the Meguma Formation. This is supported in the varying degrees of interbedding of sandstone/argillite in the argillite and sandstone units. The elemental similarity between the rock units at the Touquoy site suggests lithologies differ in grain size and are likely derived from similar host rocks.

Elemental compositions were also compared to the average crustal abundances for clastic sedimentary rocks (Price, 1997). It is important to note that the average crustal abundances provide a basis of comparison and elements elevated relative to these values does not necessarily mean it will be an environmental concern.

Compared to the average elemental compositions for clastic sedimentary rocks, arsenic concentrations are elevated in all of the principle rock units. The overall arsenic average was 1042 ppm for waste rock and marginal ore samples collected from the Touquoy site. Arsenic concentrations were observed to be highest in the argillite (<5% greywacke interbeds) with an average of 1620 ppm and a maximum of 15,000 ppm. Although the maximum concentration skews the average in this unit, the median value of 340 ppm also remains elevated over the average crustal abundance of 13 ppm. Arsenic concentrations in the tailings samples ranged from 160 ppm in the blended overall sample to a maximum of 1300 ppm in the TET (eastern section top) sample.

The average concentrations of silver and selenium were also observed to be elevated relative to the average crustal abundances for clastic sedimentary rocks. Maximum average concentrations of silver (0.73 ppm) and selenium (2.3 ppm) occurred in the quartz vein and the marginal ore units respectively. Maximum concentrations of silver (1.1 ppm) and selenium (7.0 ppm) were observed in the argillite (<5% greywacke interbeds).

4.2 Mineralogy

Five samples were selected for mineralogical analysis. The purpose of performing this analysis was to quantify the mineralogical characteristics of the waste rock, specifically the sulphide and carbonate bearing mineral phases as these have the greatest influence on the acid generating/neutralization potential of the sample.

Samples selected for mineralogy include:

Sample #	Hole #	From (m)	To	Lithology	Lithological Description
06-034	MR-05-091	10	20	G/A	Greywacke (20-50% argillite interbeds)
06-049	MR-05-122	10	20	AR	Argillite (<5% greywacke interbeds)
06-073	MR-05-094	12	22	AR	Argillite (<5% greywacke interbeds)
06-066	MR-05-084	65	72	GW	Greywacke (<20% argillite interbeds)
06-070	MR-05-083	68	75	Comp	Composite (greywacke and argillite)

Note:
Based on data from Lakefield (2006).

Based on Lakefield's mineralogical report (2006) (Appendix D), the three main sulphide minerals are pyrite, pyrrhotite and arsenopyrite. Examination of the textural associations of these minerals indicate that 50-80% of the pyrite and 50-100% of the pyrrhotite occurs locked within the silicate particles and may not be readily available to oxidize and produce acidity. Only a minor proportion of arsenopyrite (0-26%) occurs locked among silicate particles. Therefore, sulphide speciation (i.e., mineralogical association) in the waste rock materials will influence the acid producing potential of the samples. The following table presents the five samples selected for mineralogical analyses, the percentage of sulphide minerals in the sample, and the predominant sulphide mineral(s) encountered.

Sample	Lithology	% sulphide minerals in sample (by weight)	Predominant Sulphides Observed
06-034	Greywacke (20-50% argillite interbeds)	0.08	Arsenopyrite
06-049	Argillite (<5% greywacke interbeds)	0.22	Pyrrhotite & Arsenopyrite
06-073	Argillite (<5% greywacke interbeds)	0.55	Pyrite & Arsenopyrite
06-066	Greywacke (<20% argillite interbeds)	0.24	Arsenopyrite
06-070	Composite (greywacke and argillite)	0.37	Pyrite

Note:
Predominant sulphide minerals Based on data from Lakefield (2006). Sulphide content based on ABA test results.

Availability and the type of carbonate minerals will also influence the available neutralization potential of the samples. The predominant carbonate minerals present in the five samples submitted for mineralogical analyses are calcite, dolomite and ankerite. The distribution of the carbonate species is presented in the following table:

Mineral	Sample Formula	06-034		06-049		06-066		06-070		06-073	
		wt. %	Dist'n %	wt. %	Dist'n %	wt. %	Dist'n %	wt. %	Dist'n %	wt. %	Dist'n %
Calcite	$CaCO_3$	4.49	99.8	3.24	78.7	3.38	78.9	3.17	68.3	5.26	68.8
Dolomite	$CaMg(CO_3)_2$	0.0	0.1	0.48	11.8	0.83	19.5	1.46	31.4	0.66	8.6
Ankerite	$Ca(Fe,Mg,Mn)(CO_3)_2$	0.0	0.1	0.39	9.4	0.06	1.5	0.01	0.2	1.71	22.4
Siderite	$FeCO_3$	0.001	0.0	0.01	0.1	0.01	0.1	0.002	0.1	0.02	0.2
Total		**4.5**	**100**	**4.1**	**100**	**4.3**	**100**	**4.6**	**100**	**7.7**	**100**

Note:
Based on data from Lakefield (2006).

Although the textural relationship of the carbonate minerals suggests that approximately 53% to 78% are either liberated or exposed and are amenable to dissolution and neutralization (Lakefield, 2006), the carbonate species will influence the effectiveness of the neutralization potential. For example, calcite is readily soluble and is an effective neutralizing mineral; however, manganese and iron carbonates create acidity when they dissolve and no net alkalinity is produced (Price, 1997). Therefore, the predominant cation available in the ankerite carbonates during hydrolysis will influence the neutralization potential of this mineral. The percentage of carbonate available for neutralization is a function of the form of mineral as well as the amount of exposure of the mineral on faces of the larger grainsize particles.

4.3 Acid Generating Potential and Metal Leachability

ABA and short term leach testing was performed on waste rock and marginal ore to quantify the acid generating and metal leaching potential of these materials. The tailings samples were also submitted for ABA testing to characterize the tailings acid producing potential. Humidity cell testing was conducted for the tailings sample to quantify the expected leachability of the solids and subsequently, an aging test was completed on the supernatant to characterize the water quality of the process water.

Results of the ABA testing are summarized in Table 5 and in Figures 3 through 6. Metal leachability was assessed by short term leach tests (i.e., SPLP). Short term leach test results are summarized in Table 6 and are provided graphically in Figure 7. It is important to note that short-term leach analyses are aggressive leaching tests that generally produce elevated dissolved elemental concentrations that are not representative of what would occur under ambient conditions. Comparisons relative to environmental guidelines are applied here for illustrative purposes only. Appendix C graphically shows the sample locations on cross sections.

NAG testing was performed in order to confirm the results of ABA and assess the metal leaching potential from each rock type under terminal conditions (i.e., after the complete oxidation of sulphide minerals and complete dissolution of neutralizing minerals). NAG test results, including comprehensive analysis of selected NAG leachates, are provided in Table 7.

Static and kinetic test results are discussed by lithology, followed by a more general discussion of the relationship of the results, including a discussion of the remaining lithologies that occur in minor amounts.

4.3.1 Argillite (<5% greywacke interbeds)

The argillite (<5% greywacke interbeds) unit, referred to here as the "argillite unit", is expected to comprise 88% of the waste rock (Atlantic, 2006b) and as such, represents the majority of the sample population. Of the ore, 88% is also expected to occur in the argillite unit. In total, 39 argillite samples were collected from the three main areas of the open pit, including: 11 samples from the Western portion; 18 samples from the Central portion; and, 10 samples from the Eastern portion.

ABA results also exist for four samples previously collected by Atlantic and were included into the static results database.

Acid-Base Accounting

Results of the ABA testing for the argillite unit are presented in Table 5 and in Figures 3 through 6. Total sulphur and sulphide content was elevated in the argillite compared to the overall waste rock. The total sulphur content of the argillite samples reached a maximum of 1.6% with an overall average of 0.4% and a median value of 0.25%. As presented in Figure 3, the majority of this sulphur occurs as sulphide for samples containing lower total sulphur concentrations (e.g. <0.3%). As the total sulphur concentration increases, more of the sulphur is attributed to sulphate. The argillite unit has the lowest carbonate concentration compared to the principle rock types with an average concentration of 1.6%. This is slightly below the overall average of 1.8 %.

As can be seen in Figure 4, only a weak correlation exists between the bulk neutralizing potential (NP) and the carbonate neutralizing potential (CaNP), indicating the neutralizing source varies in the argillite unit. It is important to note that for some of the argillite samples, the CaNP is greater than the bulk-NP (Figure 4). This can be attributed to the difference in the determination methods of the two parameters. As described in Section 3.2.1, the bulk-NP (referred to as NP) measured during analysis by acidification of a sample, followed by back titration to determine the amount of acid consumed. Calculation of CaNP is based on a theoretical stoichiometric conversion assuming all of the carbonate is in the form of calcite. Mineralogical analyses on two argillite samples (06-049 and 06-073) indicate that although the majority of the carbonates take the form of calcite, dolomite (maximum 11.8%) and ankerite (maximum 22.4%) are also present in the samples. Dolomite is less soluble than calcite, and iron and manganese ankerites produce no net neutralizing potential (Price, 1997), thus the CaNP could be overestimated on the basis of the stoichiometric conversion.

Comparing the NP to the acid producing potential (AP) provides an indication of the potential for a sample to generate acidity. CaNP/AP ratios provide a conservative estimate of the acid producing potential of a sample since it excludes the bulk NP component. Acid generation potential was assigned using the CaNP/AP and NP/AP ratios, based on the criteria of Price (1997). Using CaNP/AP, 18 of 39 samples have some potential to produce acidity (Figure 5), whereas only 12 of 39 are identified as having some acid potential using NP/AP ratios (Figure 6). Of the 18 samples that have some potential to produce acidity (i.e. CaNP/AP < 4), two are likely acid generating (CaNP/AP <1), three are possibly acid generating (CaNP/AP between 1 and 2) and the remaining 13 have low acid producing potentials (CaNP/AP between 2 and 4). Based on these results between 5% and 13% of the samples are expected to be acid generating.

Short Term Leach Testing

Short term leach testing was done on a subset of 17 argillite samples and results of this testing are presented in Table 6 and Figure 7a. Based on the test results, average aluminium (0.4 mg/L) and arsenic (0.2 mg/L) and maximum concentrations of iron (0.4 mg/L), lead (0.0012 mg/L) and zinc (0.08 mg/L) exceeded CCME (1999) guideline values. The maximum concentration of arsenic (1.3 mg/L) exceeded the MMER (2002) guideline value of 0.5 mg/L. These parameters are being considered further as part of a treatment assessment and an overall water quality assessment currently underway.

Net Acid Generation Testing

Nineteen argillite (<5% greywacke) samples were submitted for NAG testing for the purpose of:

- assessing the acid generation potential of samples with "low" to "potential" propensities for acid generation under terminal conditions; and,
- assessing the terminal water quality associated with potentially acid generating and non-acid generating argillite.

NAG-pH is used as a qualitative indicator for acid generation potential under terminal conditions. NAG-pH is measured after the complete oxidation of sulphide minerals and dissolution of NP contributing phases, and as such is a measure of the terminal pH buffering capacity of a sample.

Four out of nineteen samples reported acidic NAG-pH values, less than pH 5 (Table 7). These samples were collected from the Western Pit, and had NP/AP ratios ranging from 0.4 to 1.8. The NAG-pH of samples with "low" to "possible" potentials for acid generation ranged from 6.85 to 10.43. Samples with NP/AP ratios greater than 4 had NAG-pH values that ranged from 7.67 to 10.8.

Three samples were submitted for comprehensive analysis of NAG leachate in order to assess terminal leachate characteristics. Concentrations of several metals exceeded the CCME guideline in potentially acid generating argillite (06-083), including aluminium, arsenic, cadmium copper, iron, nickel, lead, selenium and zinc. Terminal concentrations of aluminium and arsenic exceed the CCME guideline in non-acid generating samples 06-053 and 06-078 and are being further evaluated as part of ongoing work.

Humidity Cell Testing

Four argillite (<5% greywacke) samples were submitted for long-term leach testing: 06-006, 06-017, 06-049 and 06-079. Select results from each humidity cell are presented in Figures 8a through 8d. Complete analytical results are provided in Appendix B.

For discussion purposes, the results are compared to the MMER effluent guidelines and CCME freshwater receiving water guidelines for the protection of aquatic life.

Based on 20 weeks of testing, the data indicate the following:

- All argillite (<5% greywacke) humidity cells had neutral pH, ranging from 7.0 to 8.1 pH units;
- Sulphate concentrations of up to 55 mg/L were measured during the initial flushing of the cells, but have since decreased to a steady-state concentration of approximately 5 mg/L.
- No trace metal concentrations exceeded the MMER effluent guidelines in any of the argillite (<5% greywacke) cells;
- Dissolved arsenic concentrations were consistently elevated relative to the CCME guideline of 0.005 mg/L. Dissolved arsenic concentrations ranged from 0.0138 to 0.0481 mg/L in cell 06-006; 0.004 to 0.0276 mg/L in cell 06-049; 0.0341 to 0.106 mg/L in cell 06-079; and, 0.111 to 0.658 mg/L in cell 06-017;
- Dissolved aluminium concentrations were consistently elevated relative to the CCME guideline of 0.1mg/L for samples 06-006 (0.08 to 0.182 mg/L) and 06-049 (0.106 to 0.162 mg/L);
- Trace metals that have not stabilized at steady-state concentrations include zinc and manganese (06-006), zinc and cobalt (06-017), and zinc and lead (06-079). None of these metals occur at concentrations that exceed CCME or MMER criteria;

Depletion calculations were performed using the results of kinetic testing and tabulated in Appendix B-9. The production rate of sulphate and subsequent depletion rate of NP was calculated in order to assess the relative time to depletion of sulphide and NP-bearing minerals. Acidic conditions could result in the long term if NP depletes prior to sulphide.

- The depletion rate of NP exceeds that of AP in samples 06-006 and 06-017, therefore long-term acid generating conditions in these samples is possible; and

- The depletion rate of NP is approximately the same as that of sulphide in 06-049, and sulphide will deplete prior to NP in sample 06-017. NAG testing indicates that terminal leachate resulting from the complete oxidation of sulphide in these samples will not likely have an acidic pH.

The long term leach rates provide valuable input data which is used in the follow-up water quality assessment underway.

4.3.2 Greywacke (<20% argillite interbeds)

The greywacke (<20% argillite interbeds) unit, referred to here as the "greywacke unit", is expected to account for 2% of the waste rock and ore (Atlantic, 2006b) in the current pit model. Ten samples in total were collected from this unit. All of the samples were collected from the Western portion of the current open pit design. Five existing samples collected by Atlantic were included in the greywacke unit statistical calculations.

Acid-Base Accounting

Results of the ABA testing for the greywacke unit are presented in Table 5 and in Figures 3 through 6. The maximum total sulphur content of the greywacke samples is 0.6%, with an overall average of 0.16%. Sulphide concentrations range from 0.03 to 0.6% and although a positive correlation exists between sulphide and total sulphur, sulphate concentrations also contribute a significant component to the total sulphur and range from 0.002 to 0.3% (Figure 3).

Carbonate concentrations in the greywacke unit range from 1.1 to 3.8% and contribute the majority of the bulk-NP (Figure 4). Compared to the acid producing potential of the greywacke unit (Figures 5 and 6), the greywacke contains sufficient neutralizing potential to buffer acid production and all of the samples are classified as unlikely to produce acidity using the criteria of Price (1997).

Short Term Leach Testing

Leach testing was done on a subset of three greywacke samples and results of this testing are presented in Table 6 and Figure 7b. Based on the test results, average aluminium (0.5 mg/L) and arsenic (0.09 mg/L) and maximum concentrations of lead (0.0013 mg/L) and zinc (0.08 mg/L) exceeded CCME guideline values.

Net Acid Generation Testing

Three greywacke samples were submitted for NAG testing in order to assess terminal acid generation potential and leachate characteristics. All samples were non-acid generating, according to NP/AP (Table 7). Alkaline NAG-pH values were measured in all samples, indicative of a lack of long-term acid generation potential. Metals that occurred at concentrations exceeding CCME guidelines include aluminium (0.81 to 0.89 mg/L) and arsenic (0.02 to 0.33 mg/L).

Humidity Cell Testing

One sample of greywacke (<20% argillite) was submitted for humidity cell testing. Select results are presented in Figure 9. Full analytical results are provided in Appendix B. The first sixteen weeks of data on sample 06-068 indicate the following:

- The pH in the waste rock humidity cell has remained neutral throughout the duration of testing, ranging from 7.4 to 8.3 pH units;
- Sulphate concentrations initially increased to 32 mg/L during the initial flushing but have since decreased to a steady state concentration of approximately 3 mg/L;
- No metal concentrations exceeded the MMER effluent guidelines;
- Dissolved arsenic concentrations were consistently elevated relative to the CCME guideline of 0.005 mg/L, ranging from 0.03 to 0.20 mg/L;
- Dissolved aluminium concentrations were consistently elevated relative to the CCME guideline of 0.1mg/L, ranging from 0.09 to 0.25 mg/L;
- Concentrations of several trace metals, including cobalt, copper and zinc have not stabilized at steady-state concentrations; and
- Depletion rates of NP and sulphide were calculated using the results of kinetic testing (Appendix B-9). It is possible that mineralogical sources of NP will deplete prior to sulphide, however the low sulphide content of the samples precludes generation of significant acidity, therefore the sample is expected to be non-acid generating in the long term.

4.3.3 Mixed Units

Mixed units at the Touquoy site collectively account for approximately 10% of the waste rock and ore that will be extracted from the open pit during operations (Atlantic, 2006b). For discussion purposes, the following are considered as mixed units: argillite (5-49% greywacke interbeds), greywacke (20-50% argillite interbeds) and composite samples. As the names suggest, the mixed argillite (5-49% greywacke interbeds) contains a higher proportion of greywacke and vice versa for the greywacke (20-50% argillite interbeds). Composite samples of the argillite, greywacke and interbedded units were collected in areas where the variability of these units was too high to be considered as one unit but are considered to provide a significant proportion of rock to the waste pile over that bench interval. The static test results of the three mixed units are discussed individually below.

4.3.4.1 Argillite (5-49% greywacke interbeds)

In total, six samples were collected from the argillite (5-49% greywacke interbeds) unit, referred to here as the "argillite/greywacke unit". Of the six samples, one was from the Western portion, three were from the Central portion and two were from the Eastern portion relative to the current open pit design. One existing sample collected by Atlantic was included into the argillite/greywacke unit statistical calculations.

Acid-Base Accounting

Results of the ABA testing for the argillite/greywacke unit are presented in Table 5 and in Figures 3 through 6. The maximum total sulphur content of the argillite/greywacke samples is 0.7%, with an overall average of 0.2%. Similar to the argillite unit, there is a stronger correlation between total sulphur and sulphide sulphur for samples with total sulphur concentrations less than 0.3% (Figure 3). Two argillite samples with total sulphur concentrations greater than 0.3% have a relatively greater sulphate sulphur content. Carbonate concentrations in the argillite/greywacke unit range from 1.3 to 2.9%.

On average, the argillite/greywacke unit contains sufficient carbonate to neutralize acid production as a result of sulphide oxidation. Carbonate provides the majority of the neutralizing potential (Figure 4). Using the Price (1997) classification system, none of the samples have the potential to generate acidity based on the CaNP/AP ratio (Figure 5). Sample 06-082 was classified as having a low potential to generate acidity (i.e. 2<NP/AP<4) relative to the available bulk NP (Figure 6). This particular sample has an elevated CaNP relative to the bulk-NP. It is likely that the CaNP is overestimated for this sample due to the presence of unreactive carbonates, such as ankerite or siderite. This sample should therefore be recognized as having a low potential to produce acidity.

Short Term Leach Testing

Leach testing was done on a subset of three argillite/greywacke samples and results of this testing are presented in Table 6 and Figure 7a. Based on the test results, average aluminum (0.2 mg/L) and arsenic (0.06 mg/L) concentrations have the potential to exceed the CCME guideline values of 0.1 mg/L and 0.005 mg/L respectively. Maximum zinc concentrations also exceeded the CCME guideline value of 0.03 mg/L.

Net Acid Generation Testing

Sample 06-082, which had a "possible" potential for acid generation, was submitted for NAG testing to confirm terminal acid generation characteristics (Table 7). The NAG-pH of this sample was 9.0, which indicates that long-term acid generation from this sample is unlikely. Metals that occurred at concentrations exceeding the CCME guidelines in terminal leachate include aluminium, arsenic, and copper.

Humidity Cell Testing

Select results of long-term leach testing of sample 06-012 are presented in Figure 10. Complete analytical results are provided in Appendix B. Data on sample 06-012 indicate the following:

- Humidity cell leachate has a neutral pH, ranging from 6.9 to 8.2 pH units;
- Sulphate concentrations increased to 40 mg/L during the initial flushing of the cell, but have since stabilized at approximately 2 mg/L;
- No metal concentrations exceeded the MMER effluent guidelines;
- Dissolved arsenic concentrations were consistently elevated relative to the CCME guideline of 0.005 mg/L, ranging from 0.01 to 0.02 mg/L;
- Generally, metal concentrations have steadily decreased since the first weeks of flushing of the cells; and,
- The depletion rate of NP exceeds that of sulphide (Appendix B-9), however the low sulphide content of the samples precludes generation of significant acidity, therefore the sample is expected to be non-acid generating in the long term.

4.3.4.2 Greywacke (20-50% argillite interbeds)

In total, twelve samples were collected from the greywacke (20-50% argillite interbeds) unit, referred to here as the "greywacke/argillite unit". Eleven of the samples were collected from the Central portion and one was collected from the Western portion of the current open pit design. One sample was previously collected by Atlantic and was included in the greywacke/argillite database.

Acid-Base Accounting

Results of the ABA testing for the greywacke/argillite unit are presented in Table 5 and in Figures 3 through 6. The maximum total sulphur content of the greywacke/argillite samples is 0.6%, with an overall average of 0.2%. In general, the majority of the total sulphur can be attributed to the sulphide component (Figure 3). The average sulphate concentrations in the greywacke/argillite unit are 0.05% with a maximum of 0.14%.

Carbonate concentrations in the greywacke/argillite unit range from 1.68 to 3.62%. Although the majority of carbonate concentrations in the greywacke/argillite provide a significant proportion of the bulk-NP (Figure 4), sulphide concentrations were high enough in three of the samples (06-001, 06-039 & DA0472) to produce CaNP/AP ratios less than four (Figure 5). Only one sample (06-039) in the greywacke/argillite unit is classified as possibly acid generating (1<NP/AP<2) (Figure 6).

Three samples (06-002, 06-026 & 06-039) had CaNP values greater than bulk-NP (Figure 4). The CaNP of these samples are likely overestimated due to non-reactive carbonate minerals such as ankerite and siderite.

Short Term Leach Testing

Leach testing was done on a subset of two greywacke/argillite samples. The results of this testing are presented in Table 6 and Figure 7b. Based on the test results, average aluminum (0.3 mg/L) and arsenic (0.2 mg/L) were found elevated to the CCME guideline values 0.1 mg/L and 0.005 mg/L respectively. The maximum concentration of lead (0.0012 mg/L) was marginally above the CCME guideline value of 0.001 mg/L.

Net Acid Generation Testing

Three samples were submitted for NAG testing, including two non-acid generating samples (NP/AP > 4), and one potentially acid generating sample (NP/AP ~ 2). The NAG-pH of greywacke/argillite samples ranged from 8.1 to 11.3, indicative of an unlikely propensity for long-term acid generation. Terminal NAG leachates had concentrations of aluminum (0.01 to 2.11 mg/L), arsenic (0.01 to 4.72 mg/L) and zinc (0.003 to 0.03 mg/L) that exceeded CCME guidelines.

Humidity Cell Testing

Select results of kinetic testing of sample 06-039 are presented in Figure 11. Complete analytical results are provided in Appendix B. The data from sample 06-039 indicates the following:

- pH in the waste rock humidity cell ranged from 7.3 to 8.3 pH units;
- Sulphate concentrations ranged from 65 mg/L during the initial flushing of the cell to a stabilized concentration of approximately 5 mg/L;
- No metal concentrations exceeded the MMER effluent guidelines;
- Dissolved arsenic concentrations were consistently elevated relative to the CCME guideline of 0.005 mg/L, ranging from 0.05 to 0.41 mg/L;
- Dissolved aluminium concentrations were occasionally elevated relative to the CCME guideline of 0.1mg/L, ranging from 0.04 to 0.14 mg/L;
- Concentrations of arsenic, aluminum, zinc and lead are increasing after 16 weeks of testing; and
- Depletion rates of NP and sulphide, calculated using the results of humidity cell testing (Appendix B-9), indicate that NP will likely deplete prior to sulphide, which may result in long-term acid generating conditions. However, NAG testing of sample 06-039 indicates that terminal water quality, resulting from the complete oxidation of all sulphide minerals and dissolution of NP-contributing phases, will likely have a neutral pH.

4.3.4 Composite Samples

In total, fifteen composite waste rock samples were collected from the Touquoy site. Seven of these were from the Western portion, five from the Central portion and three from the Eastern portion of the current open pit design.

<u>Acid-Base Accounting</u>

Results of the ABA testing for the composite samples are presented in Table 5 and in Figures 3 through 6. The maximum total sulphur content of the composite samples is 0.5%, with an overall average of 0.2% which is lower compared to the other principal lithologies. The majority of the total sulphur can be attributed to sulphide (Figure 3). Similar to other units, samples with total sulphur concentrations greater than 0.3% have a higher preponderance of sulphate. The average sulphate concentration in the composite samples is 0.05% with a maximum of 0.21%.

On average, the composite samples had sufficient carbonate concentrations to neutralize acid production as a result of sulphide oxidation. Using the Price (1997) classification system (See Section 3.2.1), only one sample (06-070) of the fifteen is classified as possibly having the potential to generate acidity based on the CaNP/AP ratio (Figure 5) and relative to the bulk NP (Figure 6). The remaining samples were classified as non-acid generating with average CaNP/AP and NP/AP values of 7.6 and 9.1 respectively.

CaNP and bulk-NP are well correlated (Figure 4) which indicates that most of the neutralising potential comes from carbonate minerals.

Short Term Leach Testing

Leach testing was done on a subset of five composite samples and results of this testing are presented in Table 6 and Figure 7c. Based on the test results, average aluminum (0.3 mg/L) and arsenic (0.06 mg/L) were found elevated to the CCME guideline values of 0.1 mg/L and 0.005 mg/L respectively. The maximum concentration of lead (0.0015 mg/L) was marginally above the CCME guideline value of 0.001 mg/L.

Net Acid Generation Testing

Two composite samples were submitted for NAG testing, one considered non-acid generating based on ABA results and the other with a potential for acid generation. Both samples reported alkaline NAG-pH values (Table 7), which is indicative of an unlikely propensity for long-term acid generation. Aluminium (0.58 to 1.43 mg/L) and arsenic (0.003 to 0.08 mg/L) concentrations exceeded CCME guidelines in NAG leachate.

Humidity Cell Testing

Select results of kinetic testing of samples 06-051 and 06-070 are presented in Figures 12a and 12b. Complete analytical results are provided in Appendix B. The results from samples 06-051 and 06-070 are as follows:

- pH ranges from 7.0 to 7.9 pH units in sample 06-051, and 6.9 to 7.7 in sample 06-070;
- During the initial flushing of cell 06-051, sulphate concentrations increased to 130 mg/L, but have since decreased to around 5 mg/L. The initial sulphate concentration in sample 06-070 peaked at 40 mg/L, and stabilized at approximately 5 mg/L;
- No metal concentrations exceeded the MMER effluent guidelines;
- Dissolved arsenic concentrations were consistently elevated relative to the CCME guideline of 0.005 mg/L for sample 06-070, ranging from 0.01 to 0.015 mg/L. Arsenic concentrations rarely exceed the CCME guideline in 06-051, ranging from 0.002 to 0.007 mg/L;
- Generally, metal concentrations have steadily decreased since the first weeks of flushing for sample 06-051, but have increased slightly during week 20. Trace lead concentrations have not stabilized in sample 06-070; and
- The rate of depletion of sulphide exceeds the depletion rate of NP in sample 06-070. NAG testing of this sample indicates that terminal leachate will have a neutral pH. Depletion calculations indicate that sulphide will deplete in approximately the same amount of time required to deplete NP in sample 06-051.

4.3.5 Marginal Ore

It is expected that a marginal ore stockpile will be present on site. Eleven marginal ore samples were collected to quantify the acid producing potential of these materials. The samples were selected over intervals that were dictated by the average grade and were collected where they were available and not according to lithology or location. However, nine of the eleven samples were collected from the argillite unit since this unit host the majority of the ore (approximately 88%). The remaining two samples are composite samples.

Acid-Base Accounting

Results of the ABA testing for the marginal ore samples are presented in Table 5 and in Figures 3 through 6. The maximum total sulphur content of the marginal ore is 0.6%, with an overall average of 0.4%. Sulphide concentrations range from 0.08 to 0.42%. Although a positive correlation exists between sulphide and total sulphur, sulphate concentrations contribute a significant component to the total sulphur, ranging from 0.04 to 0.36% (Figure 3).

Carbonate concentrations range from 0.7 to 2.3%, and contribute the majority of the bulk-NP (Figure 4). Based on the CaNP/AP ratios calculated for the marginal ore samples and employing the criteria of Price (1997), five samples have some potential to produce acidity (Figure 5) whereas only four are identified as having some acid potential using NP/AP ratios (Figure 6). Of the five samples that are described as having some potential to produce acidity (i.e. CaNP/AP < 4), one is possibly acid generating and the remaining four have low acid producing potentials.

One marginal ore sample (06-088) was observed to have a CaNP value greater than bulk-NP value (Figure 4), however some of the CaNP is likely in the form of non-reactive carbonate minerals.

Short Term Leach Testing

Leach testing was done on a subset of three marginal ore samples and results of this testing are presented in Table 6 and Figure 7c. Based on the test results, average aluminum (0.6 mg/L) and arsenic (0.06 mg/L) and maximum concentrations of iron (0.6 mg/L) and zinc (0.07 mg/L) exceeded CCME guideline values.

Net Acid Generation Testing

Four marginal ore samples were submitted for NAG testing. Based on the results of ABA, three samples had a potential for acid generation, and one was considered unlikely to generate acid. All samples reported neutral to alkaline NAG-pH values (Table 7), indicative of an unlikely potential for long-term acid generation. Aluminum (0.57 to 0.67 mg/L) and arsenic (0.007 to 0.02 mg/L) occurred in concentrations that exceeded the CCME guidelines.

Humidity Cell Testing

Figure 13 presents select results of kinetic testing of sample 06-085. Complete analytical results are provided in Appendix B. The first sixteen weeks of data on sample 06-085 indicate the following:

- pH in the waste rock humidity cell has remained neutral, ranging from 6.6 to 7.7 pH units;
- Sulphate concentrations initially increased to 40 mg/L during the initial flushing but have since decreased to around 10 mg/L;
- No metal concentrations exceeded the MMER effluent guidelines;
- Dissolved arsenic concentrations were consistently elevated relative to the CCME guideline of 0.005 mg/L, ranging from 0.008 mg/L to 0.02 mg/L;
- With the exception of zinc and copper, metal concentrations have steadily decreased since the first weeks of flushing; and
- Depletion calculations completed using the results of kinetic testing indicate that sulphide will likely deplete prior to the mineralogical sources of NP; therefore long-term acid generation is unlikely.

4.3.6 Ore

Nine ore samples were previously collected by Atlantic and their acid generating potential was assessed based on ABA testing. Results of this testing are presented in Table 5 and in Figures 3 through 6. Total sulphur concentrations ranged from 0.14 to 0.98% with an average value of 0.48%. Most of the total sulphur was in the form of sulphide (Figure 3). Carbon concentrations in the ore range from 0.8 to 3.27% and account for approximately half of the bulk-NP (Figure 4). Based on the CaNP/AP ratios calculated for the ore samples and employing the criteria of Price (1997), all samples with the exception of one have some potential to produce acidity (Figure 5) whereas only six of the nine are identified as having some acid potential using NP/AP ratios (Figure 6).

4.3.7 Tailings

Results of the elemental analyses for the tailings samples are presented in Tables 3 and 4. XRF analyses indicate that the bulk chemistry of the tailings sample is analogous to the waste rock samples. This is expected since the ore is disseminated throughout the sedimentary rock as opposed to being associated with post-depositional veining (Atlantic, 2006a). ICP trace element analyses indicate that the arsenic concentration in tailings and head composite samples is elevated

(160 ppm to 1300) ppm relative to the average crustal abundances for clastic sedimentary rocks (Price, 1997). The following metals were also elevated in the tailings sample relative to the overall sample averages and compared to the average crustal abundances: chromium, copper, manganese and molybdenum.

Acid-Base Accounting

Results of the ABA testing for the tailings samples are presented in Table 5 and in Figures 3 through 6. The sulphide content of the tailings samples ranges from 0.03 to 0.12 wt. % sulphide (Figure 3). The tailings samples have sufficient carbonate concentrations (0.7 to 1.6 %), which provided the majority of the neutralizing potential (Figure 4), to neutralize acid production as a result of sulphide oxidation. Using the Price (1997) classification system, the tailings are not expected to be acid generating due to the lack of sulphide minerals and the availability of carbonate minerals.

Supernatant Aging Results

Tailings supernatant water, generated during leaching and detoxification of the ore head sample, was retained and scanned on the following days: 0, 3, 7, 14, 31 and 45 for selected parameters. Results of this testing are presented in Table 8. Likewise, tailings supernatant water from treatment of the TWB sample was scanned on days: 0, 1, 3, 7, 15, 30 and 44. Results of this testing are presented in Table 9. The purpose of the aging test analyses was to describe the natural attenuation of various parameters through time and to quantify the water quality of the process water being discharged to the tailings management facility. It appears that for CND 2, on day 31 several of the parameter concentrations and instrument detection limits increased as a result of an analytical or reporting error. Results from day 31 are therefore not included in the following discussion. Although the process water will not be discharged directly to the environment, for discussion purposes, aging test results were compared to the MMER effluent guidelines and CCME freshwater receiving water guidelines for the protection of aquatic life.

Weak acid dissociable cyanide (CN-wad) concentrations in the tailings were detoxified to <1 ppm for sample CND 2. For sample CN1 CND1-7 detoxification to 10 ppm cyanide was attempted to evaluate degradation rates of this higher cyanide concentration, however the cyandide destruction process for the tailings samples consistently resulted in total cyanide concentrations of less than 1 ppm. This is less than the MMER guideline value of 1.0 mg/L for total cyanide (CN-tot). Therefore, concentrations of CN-tot in the tailings supernatant water never exceeded this limit during the test period. As opposed to the MMER guideline, the CCME guideline of 0.005 mg/L governs the maximum allowable concentration of free cyanide (CN-free). In the analysis of the tailings supernatant water from the master composite sample (CND2), a CN-free detection limit of <0.03 to <0.05 mg/L was used. Since CN-free concentrations remained below detection throughout the test period, for comparison purposes, CN-wad was compared to the CCME guideline value. CN-wad ranged from 0.03 to 0.04 mg/L, which is above the maximum allowable concentration, however natural degradation of cyanide in the polishing pond will occur and is expected to result in significant additional reduction in these values. Cyanide concentrations are currently under further evaluation in the context of the overall site water quality.

All of the measured parameters from the tailings supernatant waters met the MMER effluent guidelines with the exception of dissolved arsenic on CND 2 - day 0 (0.53 mg/L); dissolved arsenic for CN1 CND1-7 day 1(0.9 mg/L) and copper for CN1 CND1-7 day 0,1,3 and 7 (1.2, 1.2, 1.2, and 0.8 mg/L respectively). The CCME values for discharge of arsenic and copper are 0.5 mg/L and 0.3 mg/L respectively. It is expected that treatment of arsenic will result in significant reductions of both of these concentrations, and other concentrations prior to discharge of the waters.

All of the total and dissolved parameters from the supernatant solutions are being assessed within the context of the overall site discharge water quality.

Humidity Cell Testing

Humidity cell results from the tailings samples CN1 CND1-7 and CND 2 are shown in Figures 14 and 15 for select parameters. Results from the master composite sample (CND 2), expected to be representative of the overall tailings products, indicate the following:

- pH in the tailings humidity cell has remained slightly acidic to neutral, ranging from 6.3 to 7.8 pH units for CN1 CND1-7 and from 6.9 to 7.8 pH units for CND 2;
- Sulphate concentrations initially peaked at 50 mg/L for CN1 CND1-7 and increased to 100 mg/L during week two for CND 2, but have since decreased to around 20 mg/L;
- No metal concentrations exceeded the MMER effluent guidelines;
- Dissolved arsenic concentrations ranged from 0.009 to 0.07 mg/L for CN1 CND1-7 and from 0.003 to 0.05 mg/L for CND 2. The steady state concentration of arsenic for CND 2 was approximately 0.005 mg/L, which is equal to the CCME guideline;
- Dissolved copper concentrations were elevated relative to the CCME guideline of 0.002 mg/L during the initial flushing with 0.002 to 0.004 mg/L for CN1 CND1-7 and 0.004 mg/L for CND 2;
- There is insufficient data to show trends for sample CN1 CND1-7. Generally, metal concentrations have steadily decreased since the first weeks of flushing for CND2 (except for manganese); and,
- There is not sufficient data to calculate depletion rates for CN1 CND1-7. Depletion calculations completed using the results of kinetic testing indicate that sulphide will likely deplete prior to the mineralogical sources of NP for CND 2. Based on the

depletion rates and the low sulphide content it is considered that the tailings will be non-acid generating in the long-term.

Suspended Solids

In addition to standard testing the suspended solids of the CND2 (Master Composite) treated solution from the tailings was measured at day 7 following production and found to be 29 mg/L. Treatment is expected to further result in reductions in TSS concentrations.

4.3.8 Minor Units

Quartz veining occurs randomly within waste rock materials. One sample of the quartz vein was collected to characterize the acid producing potential of this material. Since this is considered to be a minor unit relative to the other lithologies, only ABA testing was done and no leach testing was done on this sample to assess the acid generating potential of the sample. Results of this testing are provided in Table 5 and Figures 3 through 6 and are summarized as follows.

The total sulphur content of the quartz vein was 0.4%, of which 0.3% was attributed to sulphide and the remaining 0.1% to sulphate (Figure 3). The carbonate concentration of the quartz sample was 1.1% and accounts for the majority of the bulk-NP (Figure 4). When the neutralizing potentials of this sample are compared to the acid producing potential, the CaNP/AP ratio (1.9) indicates this sample is possibly acid generating (Figure 5) whereas the NP/AP ratio (2.8) indicates the quartz vein has low acid producing potential (Figure 6).

One quartz vein sample was submitted for NAG testing to confirm long-term acid generation potential. This sample had a NAG-pH of 9.0, and is considered unlikely to generate acid in the long-term.

4.4 Discussion of Overall Results

With respect to the overall materials evaluated, mineralogy and solids analysis indicate that calcite is the dominant control on buffering capacity. This suggests that even at NPR's between 2 and 4, net neutral conditions will likely be realized since calcite is quite effective at providing neutralizing capacity, as confirmed by the NAG test results.

Arsenic is the main parameter of concern at the Touquoy project and has the potential to exceed both the MMER guideline value of 0.5 mg/L and the CCME guideline values of 0.005 mg/L (Figure 16). Figure 16 is a plot of the solid arsenic component versus the dissolved concentrations derived from the short-term leach testing. It is important to understand that leach testing occurs under limited oxidization potential and only the readily available arsenic will be leached. The Lakefield (2006) mineralogy report indicates that arsenopyrite is a significant sulphide component in the Touquoy waste rock materials and is mainly liberated or exposed. Therefore, the majority of arsenopyrite is readily available to be oxidized and during this process additional arsenic may be released under oxidizing conditions, as is observed in the NAG test results.

Although some parameters exceed the CCME guidelines in the short-term leach testing, supernatant aging tests and in the tailings humidity cell, this water is not expected to be discharged directly to the environment. Furthermore, apart from arsenic (As) concentrations, no other metals were found to exceed MMER levels. A detailed water quality assessment in the context of the site wide water balance currently underway.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Overall waste rock units have similar solid chemistries and the geochemical behaviour of the units is expected to be similar. The units are therefore only distinguished based on grain size, and the greywacke and argillite of the Touquoy deposit are likely derived from similar host rocks. A review of the expected waste rock tonnages in Table 1 relative to the distribution of selected samples show the lithological distribution of samples provides a reasonable representation of the respective rock types and tonnages anticipated to be encountered in the pit based on the information available.

With respect to acid generation, the Touquoy site is significantly different from other maritime mining projects such as Voisey's Bay, or from around Halifax. The rock sequences at Touquoy do not contain the massive sulphides of a Voisey Bay type deposit, nor do they contain the sulphide rich slates of the Halifax Formation which are responsible for ARD at the Halifax Airport. Overall sulphide contents at the Touquoy project are low.

Given that only a small proportion of the potential waste materials are acid generating (2% based on samples collected to date), and given that the majority of buffering minerals are carbonate minerals for which excess neutralization potential is readily available, it is considered that overall the waste materials from the Touquoy project will be non acid generating with excess neutralizing capacity.

Additional evidence that AG will not be prevalent is available from the NAG testing completed as well as the bulk sample pit on site. The water quality from this pit remains neutral after several years exposed to the environment (Atlantic 2007 – pers. Com with Peter Carter), confirmation sampling of the water quality in this pit should be completed periodically.

Results of the trace metal analyses and leach test results indicate arsenic is the main parameter of concern for the Touquoy project. With respect to water quality values, based on the short term testing, NAG test results, and humidity test cell results, overall, values of long term and short term leachate for most parameters are neutral with low concentrations of dissolved parameters relative to other mining properties. Although some parameters (e.g. Al, As, Zn) are elevated in the short term and longer term leach testing it is important to keep in mind that these values must be taken in the context of the overall site water quality and potential site discharge. Evaluation of these parameters is currently underway as part of an overall site water quality model.

Based on the results and conclusions as presented herein recommendations are as follows:

- As opportunity presents itself (as infilling drilling occurs) a few additional confirmation samples of fresh rock in the western zones of the pit should be collected and analysed for sulphide content. Should the pit design change, the sample set and analytical results will need to be reviewed to determine if supplementary collection and geochemical characterization of samples is required.

- Monitoring should include periodic evaluation of conditions on site with respect to visual indicators of acid generating conditions such as ferric hydroxide precipitation on the waste materials and in water courses or streams.
- Monitoring of water quality form the site and tailings should be conducted regularly during operations and for a period after closure.
- Management strategies for waste rock and tailings should be re-evaluated periodically during operations and adjusted or updated if necessary based on the results of the monitoring data.

Should acid generation be observed in the materials on the surface of the pile, it is considered that the overall NP of the pile will limit vertical migration of acidic conditions in the pile. Mitigation/remediation of these small areas of the pile would involve relocation of the acid generating materials, within areas of the pile that are non-acid generating, or covering the materials to maintain clean surface runoff and limit oxidation of the materials.

It is recommended that appropriate treatment options for arsenic and other parameters be implemented if deemed necessary once an evaluation of overall site water quality is completed. This overall water quality evaluation, and an evaluation of treatment options is currently underway.

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TABLES

Table 1
Summary of Ore and Waste Rock Tonnages

Lithology	Expected Rock Tonnages	Tonnage		Percentage		Number of Samples Collected					Waste Rock and Tailings Testing Analysis							
						Individual Samples			Atlantic Gold Samples	Total	Modified ABA	Trace Metals (ICP)	Whole Rock (XRF)	Short-Term Leach	NAG	Mineralogy	Supernatant Aging	Humidity Cells
		Ore	Waste	Ore	Waste	Western	Central	Eastern										
Argillite (<5% greywacke interbeds)	21,208,000	6,688,000	14,520,000	88%	88%	11	18	10	4	43	43	39	39	17	3	2	-	4
Argillite (5-49% greywacke interbeds)	2,410,000	760,000	1,650,000	10%	10%	1	3	2	1	7	7	6	6	3	1	-	-	1
Greywacke (20-50% argillite interbeds)						1	11	-	1	13	13	12	12	2	2	1	-	1
Composite Samples						7	5	3	-	15	15	15	15	5	2	1	-	2
Greywacke (<20% argillite interbeds)	482,000	152,000	330,000	2%	2%	10	-	-	5	15	15	10	10	3	2	1	-	1
Massive Quartz Vein	-	-	-	-	-	-	1	-	-	1	1	1	1	-	-	-	-	-
Marginal Ore	-	-	-	-	-	-	-	-	-	11	11	11	11	3	2	-	-	1
Ore	7,600,000	7,600,000	-	100%	0%	-	-	-	9	9	9	-	-	-	-	-	-	-
Tailings	-	-	-	-	-	-	-	-	-	7	7	7	7	6	6	-	2	2
Total	24,100,000	7,600,000	16,500,000	100%	100%	30	38	15	20	121	121	101	101	39	18	5	2	12

Note:

Expected ore and waste tonnages provided by Atlantic (2006).

Table 2
Summary of Samples Collected for Geochemical Testing

Sample #	Hole #	Section	Location	From (m)	To	Lithology	Lithological Description
ARGILLITE (5-49%) GREYWACKE							
06-012	MR-04-039	21900 East	Central Pit	14	17	A/G	Argillite with 5-49% greywacke interbeds
06-016	MR-04-039	21900 East	Central Pit	50	59	A/G	Argillite with 5-49% greywacke interbeds
06-021	MR-05-101	21900 East	Central Pit	12	15	A/G	Argillite with 5-49% greywacke interbeds
06-040	MR-05-125	22075 East	Eastern Pit	11	15	A/G	Argillite with 5-49% greywacke interbeds
06-042	MR-03-018	22075 East	Eastern Pit	15	25	A/G	Argillite with 5-49% greywacke interbeds
06-082	MR-03-002	21650 East	Western Pit	15	19	A/G	Argillite with 5-49% greywacke interbeds
ARGILLITE (<5% GREYWACKE)							
06-004	MR-05-114	21975 East	Central Pit	10	20	AR	Argillite (<5% Greywacke)
06-005	MR-05-105	21975 East	Central Pit	35	45	AR	Argillite (<5% Greywacke)
06-006	MR-05-106	21975 East	Central Pit	15	25	AR	Argillite (<5% Greywacke)
06-009	MR-05-071	21975 East	Central Pit	20	30	AR	Argillite (<5% Greywacke)
06-010	MR-05-071	21975 East	Central Pit	40	50	AR	Argillite (<5% Greywacke)
06-014	MR-04-039	21900 East	Central Pit	26	35	AR	Argillite (<5% Greywacke)
06-017	MR-05-102	21900 East	Central Pit	10	20	AR	Argillite (<5% Greywacke)
06-019	MR-05-102	21900 East	Central Pit	48	58	AR	Argillite (<5% Greywacke)
06-022	MR-05-101	21900 East	Central Pit	15	21	AR	Argillite (<5% Greywacke)
06-025	MR-05-100	21900 East	Central Pit	12.5	20	AR	Argillite (<5% Greywacke)
06-028	MR-05-100	21900 East	Central Pit	58	68	AR	Argillite (<5% Greywacke)
06-029	MR-05-103	21900 East	Central Pit	5	15	AR	Argillite (<5% Greywacke)
06-030	MR-05-103	21900 East	Central Pit	30	40	AR	Argillite (<5% Greywacke)
06-031	MR-05-093	21900 East	Central Pit	11	21	AR	Argillite (<5% Greywacke)
06-032	MR-05-092	21900 East	Central Pit	20	30	AR	Argillite (<5% Greywacke)
06-033	MR-05-092	21900 East	Central Pit	30	40	AR	Argillite (<5% Greywacke)
06-036	MR-05-091	21900 East	Central Pit	39	44	AR	Argillite (<5% Greywacke)
06-038	MR-05-091	21900 East	Central Pit	49	59	AR	Argillite (<5% Greywacke)
06-041	MR-05-125	22075 East	Eastern Pit	15	25	AR	Argillite (<5% Greywacke)
06-043	MR-03-018	22075 East	Eastern Pit	33	42	AR	Argillite (<5% Greywacke)
06-044	MR-03-018	22075 East	Eastern Pit	60	70	AR	Argillite (<5% Greywacke)
06-046	MR-05-120	22075 East	Eastern Pit	25	35	AR	Argillite (<5% Greywacke)
06-047	MR-03-019	22075 East	Eastern Pit	17	23	AR	Argillite (<5% Greywacke)
06-048	MR-03-021	22075 East	Eastern Pit	20	28	AR	Argillite (<5% Greywacke)
06-049	MR-05-122	22075 East	Eastern Pit	10	20	AR	Argillite (<5% Greywacke)
06-050	MR-05-122	22075 East	Eastern Pit	25	35	AR	Argillite (<5% Greywacke)
06-053	MR-03-024	22075 East	Eastern Pit	14	23	AR	Argillite (<5% Greywacke)
06-054	MR-05-124	22075 East	Eastern Pit	15	25	AR	Argillite (<5% Greywacke)
06-067	MR-05-084	21650 East	Western Pit	125	130	AR	Argillite (<5% Greywacke)
06-071	MR-05-083	21675 East	Western Pit	91	98	AR	Argillite (<5% Greywacke)
06-073	MR-05-094	21625 East	Western Pit	12	22	AR	Argillite (<5% Greywacke)
06-074	MR-05-094	21625 East	Western Pit	45	55	AR	Argillite (<5% Greywacke)
06-076	MR-05-094	21625 East	Western Pit	100	105	AR	Argillite (<5% Greywacke)
06-077	MR-03-001	21650 East	Western Pit	11	20	AR	Argillite (<5% Greywacke)
06-078	MR-03-001	21650 East	Western Pit	32	40	AR	Argillite (<5% Greywacke)
06-079	MR-03-001	21650 East	Western Pit	50	59	AR	Argillite (<5% Greywacke)
06-080	MR-03-001	21650 East	Western Pit	59	65	AR	Argillite (<5% Greywacke)
06-083	MR-03-002	21650 East	Western Pit	32	37	AR	39.08-40=GW
06-084	MR-03-002	21650 East	Western Pit	59	65	AR	Argillite (<5% Greywacke)
COMPOSITE							
06-007	MR-05-107	21975 East	Central Pit	12	22	composite	Composite of Greywacke and Argillite
06-018	MR-05-102	21900 East	Central Pit	27	37	composite	Composite of Greywacke and Argillite
06-023	MR-05-101	21900 East	Central Pit	27	36	composite	Composite of Greywacke and Argillite
06-027	MR-05-100	21900 East	Central Pit	25	35	composite	Composite of Greywacke and Argillite
06-035	MR-05-091	21900 East	Central Pit	22	28	composite	Composite of Greywacke and Argillite
06-045	MR-05-120	22075 East	Eastern Pit	11	20	composite	Composite of Greywacke and Argillite
06-051	MR-03-023	22075 East	Eastern Pit	11	21	composite	Composite of Greywacke and Argillite
06-052	MR-05-123	22075 East	Eastern Pit	12	22	composite	Composite of Greywacke and Argillite
06-055	MR-05-085	21650 East	Western Pit	3	11	composite	Composite of Greywacke and Argillite
06-058	MR-05-085	21650 East	Western Pit	28	38	composite	Composite of Greywacke and Argillite
06-059	MR-05-085	21650 East	Western Pit	61	67	composite	Composite of Greywacke and Argillite
06-062	MR-05-084	21650 East	Western Pit	3	13	composite	Composite of Greywacke and Argillite
06-064	MR-05-084	21650 East	Western Pit	32	42	composite	Composite of Greywacke and Argillite
06-069	MR-05-083	21675 East	Western Pit	30	40	composite	Composite of Greywacke and Argillite
06-070	MR-05-083	21675 East	Western Pit	68	74.5	composite	Composite of Greywacke and Argillite

Table 2
Summary of Samples Collected for Geochemical Testing

Sample #	Hole #	Section	Location	From (m)	To	Lithology	Statistics
GREYWACKE (20%-50% ARGILLITE INTERBEDS)							
06-001	MR-05-128	21975 East	Central Pit	7	17	G/A	Greywacke with 20-50% argillite interbeds
06-002	MR-05-128	21975 East	Central Pit	23	33	G/A	Greywacke with 20-50% argillite interbeds
06-003	MR-05-128	21975 East	Central Pit	35	45	G/A	Greywacke with 20-50% argillite interbeds
06-011	MR-04-039	21900 East	Central Pit	6	14	G/A	Greywacke with 20-50% argillite interbeds
06-013	MR-04-039	21900 East	Central Pit	17	24	G/A	Greywacke with 20-50% argillite interbeds
06-015	MR-04-039	21900 East	Central Pit	35	40	G/A	Greywacke with 20-50% argillite interbeds
06-020	MR-05-101	21900 East	Central Pit	4	9	G/A	Greywacke with 20-50% argillite interbeds
06-024	MR-05-100	21900 East	Central Pit	6	10	G/A	Greywacke with 20-50% argillite interbeds
06-026	MR-05-100	21900 East	Central Pit	20	24	G/A	Greywacke with 20-50% argillite interbeds
06-034	MR-05-091	21900 East	Central Pit	10	20	G/A	Greywacke with 20-50% argillite interbeds
06-039	MR-04-049	21850 East	Central Pit	10	20	G/A	Greywacke with 20-50% argillite interbeds
06-057	MR-05-085	21650 East	Western Pit	20	28	G/A	Greywacke with 20-50% argillite interbeds
GREYWACKE (<20% ARGILLITE INTERBEDS)							
06-056	MR-05-085	21650 East	Western Pit	11	19	GW	Greywacke with <20% argillite interbeds
06-060	MR-05-085	21650 East	Western Pit	75	85	GW	Greywacke with <20% argillite interbeds
06-061	MR-05-085	21650 East	Western Pit	90	100	GW	Greywacke with <20% argillite interbeds
06-063	MR-05-084	21650 East	Western Pit	14	24	GW	Greywacke with <20% argillite interbeds
06-065	MR-05-084	21650 East	Western Pit	42	52	GW	Greywacke with <20% argillite interbeds
06-066	MR-05-084	21650 East	Western Pit	65	72	GW	Greywacke with <20% argillite interbeds
06-068	MR-05-083	21675 East	Western Pit	5	15	GW	Greywacke with <20% argillite interbeds
06-072	MR-05-083	21675 East	Western Pit	100	110	GW	Greywacke with <20% argillite interbeds
06-075	MR-05-094	21625 East	Western Pit	85	95	GW	Greywacke with <20% argillite interbeds
06-081	MR-03-002	21650 East	Western Pit	5	15	GW	Greywacke with <20% argillite interbeds
MARGINAL ORE							
06-008	MR-05-071	21975 East	Marginal Ore	3	13	AR	Argillite (<5% Greywacke) - marginal ore
06-085	MR-05-107	21975 East	Marginal Ore	45	50	AR	Argillite (<5% Greywacke)
06-086	MR-05-118	22150 East	Marginal Ore	32	36	AR	Argillite (<5% Greywacke)
06-087	MR-05-092	21900 East	Marginal Ore	9	13	AR	Argillite (<5% Greywacke)
06-088	MR-05-080	21725 East	Marginal Ore	34	42	AR	Argillite (<5% Greywacke)
06-089	MR-04-054	21775 East	Marginal Ore	12	16	composite	Composite of Greywacke and Argillite
06-090	MR-03-019	22075 East	Marginal Ore	42	45	AR	Argillite (<5% Greywacke)
06-091	MR-05-121	22075 East	Marginal Ore	17	19	AR	Argillite (<5% Greywacke)
06-092	MR-05-116	22150 East	Marginal Ore	39	48	AR	Argillite (<5% Greywacke)
06-093	MR-05-083	21775 East	Marginal Ore	111	115	AR	Argillite (<5% Greywacke)
06-094	MR-04-058	21775 East	Marginal Ore	13	17	composite	Composite of Greywacke and Argillite
QUARTZ VEIN							
06-037	MR-05-091	21900 East	Central Pit	44	47	QV	Massive Quartz Vein (>50% of interval)
TAILINGS							
CND2 Treated Solids (Master Composite)	-	-	-	-	-	-	Generated by SGS Lakefield using TAM master composite provided by Atlantic Gold. (Composite of TWT, TWM. TWB. TET & TEB) - Lakefield ID "CND2 Treated Solids"
TWT	-	-	-	-	-	-	Argillite location composite - western section top.
TWM	-	-	-	-	-	-	Argillite location composite - western section middle.
TWB CN Feed	-	-	-	-	-	-	Argillite location composite - western section bottom.
TET	-	-	-	-	-	-	Argillite location composite - eastern section top.
TEB	-	-	-	-	-	-	Argillite location composite - eastern section bottom.
CN1 CND 1-7 Solids (TWB)	-	-	-	-	-	-	Generated by SGS Lakefield using 20kg sample of TWB (Argillite location composite - western section bottom) as provided by Metcon Labs - Lakefield ID "CN1 CND 1-7 Solids". "CND 1-7" indicates that this is a composite sample of the 7 different tests done.

Notes:
TAM - Master Argillite Composite containing equal amounts of TWT, TWM, TWB, TET and TEB
AR - Argillite (<5% Greywacke)
A/G - Argillite with 5-49% greywacke interbeds
GW - Greywacke with <20% argillite interbeds
G/A - Greywacke with 20-50% argillite interbeds
QV - Massive Quartz Vein (>50% of interval)

Table 3
Summary of Whole Rock Results

Sample #	Statistics	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	MgO (%)	CaO (%)	Na_2O (%)	K_2O (%)	TiO_2 (%)	P_2O_5 (%)	MnO (%)	Cr_2O_3 (%)	V_2O_5 (%)	LOI (%)	Sum (%)
ARGILLITE (5-49%) GREYWACKE															
	Minimum	57.1	15.20	6.90	1.86	0.87	1.06	2.87	0.77	0.10	0.10	0.01	0.01	4.26	98.2
	Maximum	63.0	19.50	8.38	2.51	2.57	2.07	4.16	1.06	0.15	0.14	0.02	0.03	5.27	99.4
	Average	59.6	17.03	7.47	2.21	1.92	1.50	3.38	0.90	0.12	0.12	0.01	0.02	4.56	98.9
	Standard Deviation	2.4	1.67	0.53	0.23	0.64	0.37	0.53	0.11	0.02	0.01	0.00	0.01	0.40	0.47
	Median	59.1	17.15	7.33	2.23	2.01	1.51	3.22	0.88	0.12	0.11	0.01	0.01	4.38	99.0
	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6
ARGILLITE (<5% GREYWACKE)															
	Minimum	52.5	16.10	7.10	2.07	0.30	0.11	3.10	0.74	0.09	0.06	0.01	0.01	3.68	97.1
	Maximum	63.0	20.10	9.40	3.32	2.77	1.58	5.06	1.04	0.13	0.15	0.04	0.03	5.65	99.7
	Average	57.4	18.33	8.30	2.54	1.39	0.75	4.17	0.93	0.11	0.11	0.01	0.02	4.46	98.5
	Standard Deviation	2.2	0.99	0.58	0.26	0.49	0.28	0.36	0.06	0.01	0.02	0.01	0.01	0.41	0.58
	Median	57.4	18.40	8.21	2.49	1.33	0.79	4.12	0.93	0.11	0.10	0.01	0.02	4.43	98.6
	Count	39	39	39	39	39	39	39	39	39	39	39	39	39	39
COMPOSITE															
	Minimum	56.9	14.40	5.08	1.91	0.50	1.00	2.57	0.72	0.09	0.09	0.01	0.01	3.62	98.3
	Maximum	65.1	18.30	8.17	2.48	6.68	2.32	3.97	1.00	0.16	0.21	0.03	0.03	7.29	100
	Average	59.8	17.09	7.10	2.16	2.19	1.52	3.46	0.92	0.12	0.12	0.01	0.02	4.53	99.0
	Standard Deviation	2.0	1.22	0.81	0.18	1.50	0.32	0.37	0.08	0.02	0.03	0.01	0.01	0.93	0.46
	Median	59.2	17.30	7.37	2.21	1.71	1.50	3.51	0.94	0.12	0.12	0.01	0.01	4.39	98.9
	Count	15	15	15	15	15	15	15	15	15	15	15	15	15	15
GREYWACKE (20%-50% ARGILLITE INTERBEDS)															
	Minimum	55.5	11.70	3.85	0.95	1.18	0.87	1.68	0.74	0.08	0.09	0.01	0.01	3.41	98.4
	Maximum	70.8	19.60	9.06	2.57	3.89	2.77	4.23	0.99	0.14	0.15	0.02	0.03	4.92	99.7
	Average	63.4	15.26	6.17	1.79	2.19	1.93	2.86	0.87	0.11	0.11	0.01	0.02	4.09	98.9
	Standard Deviation	4.2	2.30	1.40	0.43	0.82	0.56	0.76	0.09	0.02	0.02	0.00	0.01	0.51	0.41
	Median	63.7	15.05	6.22	1.74	1.89	2.11	2.79	0.88	0.10	0.11	0.01	0.02	4.04	98.8
	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12
GREYWACKE (<20% ARGILLITE INTERBEDS)															
	Minimum	63.1	11.60	3.87	1.08	1.21	0.05	1.31	0.58	0.07	0.08	0.01	0.01	2.63	97.2
	Maximum	71.0	15.30	5.88	2.33	4.08	3.14	3.38	0.89	0.15	0.13	0.02	0.02	4.51	100
	Average	67.8	13.29	4.67	1.56	2.33	2.42	2.16	0.74	0.11	0.10	0.01	0.01	3.65	98.9
	Standard Deviation	2.5	1.10	0.68	0.38	0.97	0.89	0.65	0.11	0.03	0.02	0.00	0.00	0.65	0.89
	Median	68.3	13.00	4.54	1.55	2.06	2.63	2.10	0.73	0.12	0.10	0.01	0.01	3.65	98.9
	Count	10	10	10	10	10	10	10	10	10	10	10	10	10	10
MARGINAL ORE															
	Minimum	55.8	15.70	5.41	1.46	0.68	0.18	3.14	0.80	0.09	0.08	0.01	0.01	3.58	97.7
	Maximum	65.3	18.70	9.06	2.85	2.24	1.94	4.51	0.92	0.13	0.11	0.03	0.03	4.58	99.8
	Average	58.8	17.81	7.76	2.39	1.56	0.79	4.06	0.89	0.11	0.10	0.01	0.02	4.16	98.5
	Standard Deviation	2.6	0.83	0.94	0.36	0.46	0.45	0.40	0.03	0.01	0.01	0.01	0.01	0.29	0.63
	Median	58.2	18.00	7.94	2.37	1.61	0.71	4.15	0.89	0.11	0.10	0.01	0.02	4.16	98.2
	Count	11	11	11	11	11	11	11	11	11	11	11	11	11	11
QUARTZ VEIN															
OVERALL STATISTICS (WASTE ROCK AND MARGINAL ORE)															
	Overall Minimum	52.50	0.53	1.46	0.13	0.30	0.05	0.12	0.02	0.02	0.05	0.01	0.01	1.23	97.00
	Overall Maximum	92.00	20.10	9.40	3.32	6.68	3.14	5.06	1.06	0.16	0.21	0.04	0.03	7.29	100.30
	Overall Average	60.36	16.87	7.26	2.21	1.77	1.24	3.57	0.88	0.11	0.11	0.01	0.02	4.28	98.70
	Overall Standard Deviation	5.31	2.68	1.53	0.50	0.90	0.75	0.90	0.13	0.02	0.02	0.01	0.01	0.68	0.63
	Overall Median	58.9	17.75	7.65	2.33	1.63	0.99	3.81	0.91	0.11	0.11	0.01	0.01	4.36	98.8
	Overall Count	94	94	94	94	94	94	94	94	94	94	94	94	94	94
TAILINGS															
CND 2 Treated Solids (Master Composite)		56.9	19.70	7.70	2.60	1.16	0.57	4.80	0.54	0.11	0.08	0.03	0.02	4.47	98.7
TWT		56.9	18.20	8.11	2.52	1.28	0.64	4.32	0.87	0.10	0.10	0.03	0.02	4.42	97.5
TWM		56.9	18.50	8.22	2.64	1.46	0.58	4.43	0.84	0.11	0.11	0.02	0.02	4.21	98.1
TET		57.8	18.50	8.20	2.57	1.33	0.66	4.21	0.82	0.11	0.11	0.03	0.02	4.30	98.6
TEB		57.0	18.70	8.15	2.59	1.41	0.66	4.31	0.85	0.11	0.10	0.02	0.02	4.85	98.8
TWB CN Feed		57.7	18.40	8.32	2.58	1.17	0.38	4.49	0.96	0.10	0.11	0.02	0.02	4.28	98.6
CN1 CND 1-7 Solids (TWB)		57.0	19.60	7.65	2.61	0.97	0.40	4.86	0.66	0.11	0.09	0.02	0.02	4.42	98.4
	Minimum	56.9	18.20	7.65	2.52	0.97	0.38	4.21	0.54	0.10	0.08	0.02	0.02	4.21	97.5
	Maximum	57.8	19.70	8.32	2.64	1.46	0.66	4.86	0.96	0.11	0.11	0.03	0.02	4.85	98.8
	Count	7	7	7	7	7	7	7	7	7	7	7	7	7	7

Note:
A value equal to the instrument detection limit was used in statistical calculations when a non-detect value was encountered.

Table 4
Summary of ICP Results

Sample #	Statistics	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Bi (µg/g)	Ca (%)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (%)	K (%)	Li (µg/g)	Mg (%)	Mn (µg/g)	Mo (µg/g)	Na (%)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Sn (µg/g)	Sr (µg/g)	Ti (µg/g)	Tl (µg/g)	U (µg/g)	V (µg/g)	Y (µg/g)	Zn (µg/g)	Hg (µg/g)
ARGILLITE (5-49%) GREYWACKE																																
	Minimum	0.13	66000	35	360	1.40	0.17	0.65	0.04	14	54	27	4.80	2.2	28	1.10	820	1.70	1.10	26	9.30	0.10	2.0	1.80	98	1000	0.40	1.40	81.0	8.30	95.0	0.1
	Maximum	0.76	100000	3800	750	2.60	0.72	1.90	0.31	19	65	95	6.10	3.9	43	1.80	1100	3.00	3.70	36	44.0	2.30	3.0	2.70	140	2100	2.90	1.80	140	9.50	130	0.1
	Average	0.31	81633	737	560	1.97	0.40	1.36	0.13	16	59	59	5.38	3.05	33	1.45	953	2.30	2.10	31	22.4	0.52	2.2	2.15	118	1533	1.03	1.57	114	7.60	106	0.1
	Standard Deviation	0.23	14662	1505	141	0.43	0.19	0.46	0.10	2	4	24	0.57	0.66	5	0.27	97	0.57	1.04	4	12.3	0.88	0.41	0.37	16	418	0.93	0.15	21.3	1.24	12.9	0.0
	Median	0.21	78500	101.5	530	1.90	0.36	1.35	0.09	16	61	60	5.25	3	31	1.45	960	2.25	1.85	31	18.5	0.15	2.0	2.00	120	1500	0.70	1.50	115	7.20	100	0.1
	Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
ARGILLITE (<5% GREYWACKE)																																
	Minimum	0.12	65000	25	480	1.50	0.10	0.18	0.03	13	45	27	3.90	2.7	27	1.20	410	0.05	0.11	27	4.30	0.10	2.0	1.70	35	1100	0.50	1.40	89.0	4.30	68.0	0.1
	Maximum	1.10	110000	15000	870	3.10	1.80	2.00	0.44	22	72	130	7.30	4.5	49	2.10	1100	4.10	2.90	42	48.0	6.20	7.0	11.00	140	3500	1.20	2.00	160	19.0	140	0.1
	Average	0.35	85000	1623	650	2.15	0.49	0.95	0.14	17	60	56	5.72	3.55	35	1.57	803	1.11	1.11	33	18.4	1.16	2.2	2.60	83	2085	0.75	1.63	116	7.45	111	0.1
	Standard Deviation	0.21	9892	3334	87	0.29	0.43	0.37	0.09	3	6	23	0.80	0.44	5	0.23	141	0.76	0.79	3	10.3	1.45	0.87	1.41	21	728	0.12	0.14	15.3	2.40	14.8	0.0
	Median	0.28	87000	340	640	2.10	0.33	0.94	0.12	17	59	56	5.70	3.5	35	1.50	800	0.95	0.70	34	15.0	0.40	2.0	2.60	85	1800	0.70	1.60	110	7.00	110	0.1
	Count	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
COMPOSITE																																
	Minimum	0.11	65000	25	390	1.40	0.09	0.33	0.03	11	40	20	3.40	2.2	19	1.10	600	0.75	0.89	21	8.90	0.10	2.0	2.00	70	760	0.50	1.40	80.0	6.70	64.0	0.1
	Maximum	0.31	94000	850	680	2.50	0.42	4.80	0.18	18	74	78	6.10	3.5	42	1.70	1400	3.60	2.70	33	40.0	1.40	3.0	2.80	210	2700	0.80	2.30	130	15.0	120	0.1
	Average	0.21	83333	222	564	1.89	0.23	1.54	0.09	14	56	41	4.90	3.09	31	1.43	887	1.92	1.59	28	17.5	0.48	2.1	2.34	114	1924	0.63	1.68	106	9.47	92.1	0.1
	Standard Deviation	0.05	9256	278	86	0.30	0.09	1.12	0.05	2	8	19	0.73	0.41	5	0.19	197	0.73	0.67	3	9.45	0.42	0.26	0.30	42	604	0.09	0.23	15.1	1.98	16.6	0.0
	Median	0.20	88000	71	590	1.90	0.21	1.20	0.08	13	56	34	5.00	3.2	33	1.40	820	1.80	1.30	28	14.0	0.20	2.0	2.30	110	2100	0.60	1.70	110	9.50	90.0	0.1
	Count	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
GREYWACKE (20%-50% ARGILLITE INTERBEDS)																																
	Minimum	0.12	56000	32	270	1.10	0.13	0.81	0.03	9	41	18	2.60	1.5	12	0.69	700	1.10	0.65	15	8.40	0.10	2.0	1.10	95	770	0.40	1.30	75.0	5.20	50.0	0.1
	Maximum	0.46	88000	7000	680	2.20	1.20	2.80	0.19	26	69	69	6.20	3.7	37	1.70	1200	3.80	3.70	40	33.0	3.00	2.0	3.20	180	3100	1.50	1.90	120	11.0	110	0.1
	Average	0.25	75167	910	466	1.63	0.32	1.61	0.09	14	56	45	4.36	2.56	24	1.18	871	2.14	2.24	25	16.8	0.70	2.0	2.02	127	1586	0.62	1.63	97.9	8.47	79.0	0.1
	Standard Deviation	0.11	10513	2023	112	0.33	0.30	0.68	0.05	5	9	17	1.01	0.64	7	0.25	121	0.79	1.00	7	7.67	0.86	0	0.62	22	727	0.32	0.18	15.6	2.18	18.2	0.0
	Median	0.24	75500	69.5	500	1.70	0.23	1.35	0.07	14	59	45.5	4.60	2.5	25	1.20	855	2.05	2.00	23	13.5	0.40	2.0	1.85	125	1350	0.55	1.70	104	9.00	79.5	0.1
	Count	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
GREYWACKE (<20% ARGILLITE INTERBEDS)																																
	Minimum	0.13	59000	19	220	0.92	0.09	0.70	0.03	7	24	9.9	2.60	1.3	12	0.70	560	1.40	0.09	14	9.20	0.10	2.0	1.50	42	710	0.20	1.20	60.0	8.20	41.0	0.1
	Maximum	0.33	81000	5200	430	1.50	0.54	2.90	0.23	12	49	36	3.90	2.6	26	1.20	910	4.30	2.50	29	27.0	2.70	3.0	2.00	140	2300	0.80	1.80	86.0	11.0	66.0	0.1
	Average	0.23	66600	896	305	1.14	0.18	1.54	0.11	9	40	19	3.13	1.90	16	0.95	724	2.54	1.83	21	14.1	0.58	2.1	1.76	101	1255	0.41	1.55	71.4	10.05	52.1	0.1
	Standard Deviation	0.07	6883	1771	71	0.21	0.14	0.78	0.07	2	9	7	0.45	0.46	4	0.16	107	0.79	0.65	4	5.20	0.87	0.32	0.18	26	591	0.16	0.21	9.22	1.14	8.36	0.0
	Median	0.22	65500	52.5	295	1.05	0.12	1.35	0.07	9	41	18	3.00	1.85	16	1.00	730	2.45	1.95	20.5	13.0	0.20	2.0	1.80	100	1100	0.40	1.55	70.5	10.5	52.5	0.1
	Count	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
MARGINAL ORE																																
	Minimum	0.03	67000	8	430	1.60	0.06	0.42	0.03	9	50	16	3.90	2.6	19	0.96	580	0.31	0.18	22	6.10	0.10	2.0	1.90	46	1400	0.60	1.50	92.0	6.00	66.0	0.1
	Maximum	0.61	94000	2200	660	2.30	0.45	1.30	0.25	17	66	74	6.10	3.9	38	1.70	860	1.40	1.40	39	22.0	2.30	4.0	3.20	110	2200	0.90	1.90	110	8.80	120	0.1
	Average	0.20	82636	613	545	2.01	0.19	0.93	0.13	14	60	46	5.32	3.14	30	1.40	734	0.77	0.60	33	12.1	0.92	2.3	2.53	74	1709	0.73	1.66	101	7.20	99.0	0.1
	Standard Deviation	0.15	6990	743	64	0.20	0.10	0.28	0.07	3	6	17	0.62	0.34	5	0.22	82	0.39	0.30	5	4.86	0.72	0.65	0.38	16	274	0.08	0.14	6.17	1.09	15.3	0.0
	Median	0.16	84000	330	550	2.00	0.17	0.96	0.12	15	62	47	5.20	3.1	30	1.30	740	0.65	0.55	32	12.0	0.80	2.0	2.50	73	1600	0.70	1.70	100	7.20	100	0.1
	Count	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
QUARTZ VEIN																																
06-037	Massive Quartz Vein (>50% of interval)	0.73	13000	250	33	0.14	2.30	1.10	0.03	4	32	39	1.10	0.2	3	0.10	500	11.00	2.80	15	70.0	0.10	2.0	0.20	15	94	0.90	0.18	5.80	2.20	11	0.1
OVERALL STATISTICS (WASTE ROCK AND MARGINAL ORE)																																
	Overall Minimum	0.03	13000.00	8.00	33.00	0.14	0.06	0.18	0.03	3.60	24.00	9.90	1.10	0.20	3.00	0.10	410.00	0.05	0.09	14.00	4.30	0.10	2.0	0.20	15.00	94.00	0.20	0.18	5.80	2.20	11.00	0.10
	Overall Maximum	1.10	110000.00	15000.00	870.00	3.10	2.30	4.80	0.44	26.00	74.00	130.00	7.30	4.50	49.00	2.10	1400.00	11.00	3.70	42.00	70.00	6.20	7.0	11.00	210.00	3500.00	2.90	2.30	160.00	19.00	140.00	0.10
	Overall Average	0.26	80276.60	1042	551.31	1.88	0.37	1.21	0.12	14.74	56.07	47.32	5.02	3.06	30.02	1.39	814.89	1.66	1.42	29.67	17.66	0.85	2.2	2.41	96.04	1806.74	0.69	1.61	104.47	8.10	94.84	0.10
	Overall Standard Deviation	0.18	13114.39	2410.46	148.72	0.46	0.38	0.68	0.08	3.79	9.47	22.83	1.17	0.76	8.54	0.32	152.71	1.34	0.91	8.16	10.63	1.11	0.63	1.04	31.78	704.57	0.30	0.23	22.10	2.29	25.21	0.00
	Overall Median	0.23	82000	155.00	575.00	2.00	0.24	1.05	0.10	15	59	42	5.15	3.20	31	1.40	800	1.45	1.20	31	14.0	0.40	2.0	2.40	92	1650	0.70	1.60	110	7.80	100	0.1
	Overall Count	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94
TAILINGS																																
CND 2 Treated Solids (Master Composite)		0.35	70000	160	400	0.34	0.40	0.63	0.10	9	120	109	5.00	1.20	60	1.40	3800	5.20	0.35	44	19.0	2.10	1.0	3.20	62	2500	0.80	1.70	130	7.20	34.0	0.1
TWT		0.44	92000	610	580	2.10	0.54	0.81	2.50	30	140	50	5.50	3.50	34	1.50	670	7.70	-	100	22.0	0.80	1.0	2.60	75	1400	0.70	1.50	96.0	8.20	120	0.1
TWM		0.37	86000	640	520	2.00	0.44	0.83	1.00	18	110	44	5.40	3.30	32	1.50	690	6.30	-	63	25.0	0.60	1.0	2.20	67	1000	0.60	1.40	89.0	8.20	110	0.1
TET		0.38	91000	1300	580	2.20	0.38	0.78	1.90	19	93	46	5.40	3.40	33	1.50	680	6.30	-	63	24.0	1.80	1.0	2.70	75	1600	0.70	1.60	100	9.60	120	0.1
TEB		0.18	88000	1200	530	2.00	0.41	0.9	1.60	16	120	43	5.20	3.40	36	1.40	660	6.30	-	60	18.0	1.40	1.0	2.40	65	1300	0.60	1.50	94.0	8.40	110	0.1
TWB CN Feed		0.43	95000	1000	600	2.20	0.38	0.95	2.00	19	120	52	5.90	3.70	40	1.60	600	7.10	-	71	24.0	2.10	1.0	2.70	65	1400	0.80	1.70	100	7.20	100	0.1
CN1 CND 1-7 Solids (TWB)		0.90	90000	380.00	710	2.70	0.3	0.6	0.32	17	100	130	4.90	3.40	34	1.40	590	5.00		49	14.0	1.10	1.0	4.00	67	1800	0.90	1.90	110	8.20	95.0	0.1
	Minimum	0.18	70000	160	400	0.34	0.30	0.60	0.10	9	93	43	4.90	1.20	32	1.40	590	5.00	0.35	44	14.0	0.60	1.0	2.20	62	1000	0.60	1.40	89.0	7.20	34.0	0.1
	Maximum	0.90	95000	1300	710	2.70	0.54	0.95	2.50	30	140	130	5.90	3.70	60	1.60	3800	7.70	0.35	100	25.0	2.10	1.0	4.00	85	2500	0.90	1.90	130	9.60	120	0.1
	Count	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	1	7	7	7	7	7	7	7	7	7	7	7	7	7

Notes:
A value equal to the instrument detection limit was used in statistical calculations when a non-detect value was encountered.

Table 5
Summary of Acid-Base Accounting Results

Sample	Statistics	NP	AP	Net NP	NP/AP	S	Acid Leachable SO4-S	Sulphide-S	C	Carbonate	TIC	Carb-NP	Carb-NP/AP
#		t CaCO3/1000	CaCO3/1000	CaCO3/1000	ratio	%	%	%	%	%	%	CaCO3/1000	ratio
ARGILLITE (5-49%) GREYWACKE													
	Minimum	21.2	0.9	18.0	3.50	0.05	0.01	0.03	0.41	1.31	0.26	21.8	4.1
	Maximum	115	12	112	49.8	0.66	0.28	0.38	6.11	2.92	0.58	102	40
	Average	49.8	4.7	45.1	10.7	0.23	0.09	0.15	1.39	2.10	0.42	44.6	9.6
	Standard Deviation	30.0	3.7	30.6	17.2	0.21	0.11	0.12	2.08	0.53	0.11	26.6	14
	Median	41.9	3.5	38.2	9.90	0.13	0.03	0.10	0.61	2.05	0.41	36.0	8.5
	Count	7	7	7	7	7	7	7	7	6	6	7	7
ARGILLITE (<5% GREYWACKE)													
	Minimum	7.10	0.9	-13.3	0.40	0.03	0.00	0.03	0.10	0.30	0.06	5.0	0.2
	Maximum	73.4	26	68.8	25.6	1.62	0.78	0.84	2.43	3.75	0.75	62.5	26
	Average	30.1	6.8	23.3	4.4	0.37	0.16	0.22	0.54	1.58	0.32	26.6	3.9
	Standard Deviation	11.7	6.1	13.4	5.6	0.38	0.21	0.20	0.46	0.88	0.14	11.2	5.3
	Median	30.1	4.7	24.7	8.30	0.25	0.07	0.15	0.42	1.51	0.30	25.4	4.6
	Count	43	43	43	43	43	43	43	43	39	39	43	43
COMPOSITE													
	Minimum	8.80	1.2	7.5	2.40	0.06	0.01	0.04	0.13	0.45	0.09	7.5	1.8
	Maximum	120	12	118	63.7	0.45	0.21	0.37	1.44	6.64	1.33	111	58
	Average	39.9	4.4	35.5	9.08	0.19	0.05	0.14	0.51	2.01	0.40	33.6	7.6
	Standard Deviation	26.8	2.6	26.8	14.6	0.11	0.06	0.08	0.33	1.53	0.31	25.5	14
	Median	30.6	4.1	27.8	7.70	0.17	0.03	0.13	0.41	1.49	0.30	24.9	6.6
	Count	15	15	15	15	15	15	15	15	15	15	15	15
GREYWACKE (20%-50% ARGILLITE INTERBEDS)													
	Minimum	28.2	0.6	17.4	2.10	0.07	0.01	0.02	0.44	1.68	0.34	16.4	2.7
	Maximum	67.5	15	65.0	61.4	0.58	0.14	0.49	0.99	3.62	0.73	60.4	57
	Average	43.1	4.8	38.3	8.95	0.20	0.05	0.15	0.63	2.32	0.47	37.0	7.7
	Standard Deviation	11.1	4.0	12.8	15.6	0.14	0.04	0.13	0.18	0.63	0.13	11.8	15
	Median	40.8	2.8	36.2	11.1	0.16	0.04	0.09	0.59	2.08	0.42	34.5	12
	Count	13	13	13	13	13	13	13	13	12	12	13	13
GREYWACKE (<20% ARGILLITE INTERBEDS)													
	Minimum	21.8	0.9	18.4	5.00	0.04	0.00	0.03	0.31	1.05	0.21	17.5	4.1
	Maximum	133	19	114	67.4	0.62	0.24	0.61	7.33	3.77	0.75	122	63
	Average	51.0	3.7	47.2	13.7	0.16	0.04	0.12	1.35	2.22	0.44	41.3	11
	Standard Deviation	27.0	4.7	23.9	18.3	0.17	0.06	0.15	1.79	0.93	0.19	25.9	17
	Median	44.6	2.4	41.1	22.6	0.08	0.02	0.07	0.68	1.96	0.39	34.5	17
	Count	15	15	15	15	15	15	15	15	10	10	15	15
MARGINAL ORE													
	Minimum	18.3	2.5	13.3	2.40	0.12	0.04	0.08	0.21	0.73	0.15	12.2	1.7
	Maximum	39.4	13	28.8	12.3	0.57	0.36	0.42	0.59	2.30	0.46	38.4	11
	Average	28.0	6.1	21.8	4.56	0.39	0.19	0.20	0.38	1.51	0.30	25.2	4.1
	Standard Deviation	6.42	3.4	5.2	2.78	0.17	0.12	0.11	0.11	0.45	0.09	7.5	3.0
	Median	29.6	5.0	21.8	6.30	0.48	0.20	0.16	0.37	1.58	0.32	26.4	4.9
	Count	11	11	11	11	11	11	11	11	11	11	11	11
QUARTZ VEIN													
06-037	Massive Quartz Vein (>50% of interval)	27.5	10	17.5	2.80	0.42	0.10	0.32	0.33	1.11	0.22	18.5	1.9
OVERALL STATISTICS (WASTE ROCK AND MARGINAL ORE)													
	Overall Minimum	7.10	0.60	-13.30	0.40	0.03	0.00	0.02	0.10	0.30	0.06	5.00	0.2
	Overall Maximum	133.12	26.20	118.00	67.40	1.62	0.78	0.84	7.33	6.64	1.33	122.31	62.64
	Overall Average	37.2	5.6	31.6	12.3	0.3	0.1	0.2	0.7	1.8	0.4	32.0	10.5
	Overall Standard Deviation	19.9	4.9	20.4	13.2	0.3	0.2	0.2	1.0	0.9	0.2	18.3	11.8
	Overall Median	32.0	3.8	26.3	6.91	0.19	0.05	0.12	0.48	1.62	0.34	27.4	8.4
	Overall Count	105	105	105	105	105	105	105	105	94	94	105	105
TAILINGS [1]													
CND 2 Treated Solids (Master Composite)		21.5	3.4	18.1	6.25	0.17	0.40	0.11	0.38	1.22	-	20.3	5.9
TWT		29.2	4	17.8	2.52	0.48	0.37	0.11	0.59	1.50	-	25.0	7.1
TWM		32.4	2	21.8	3.07	0.40	0.34	0.06	0.47	1.58	-	26.4	13.4
TET		26.1	3.2	20.5	4.67	0.28	0.18	0.10	0.35	1.26	-	21.0	6.5
TEB		29.2	2.7	21.4	3.74	0.34	0.25	0.09	0.46	1.49	-	24.9	9.4
TWB CN Feed		25.0	4	9.70	1.60	0.61	0.49	0.12	0.40	1.49	-	24.9	1.6
CN1 CND 1-7 Solids (TWB)		20.6	0.90624997	14.3	3.30	0.23	0.20	0.03	0.32	0.73	-	12.1	13.4
	Minimum	20.6	0.9	9.70	1.60	0.17	0.18	0.03	0.32	0.73	-	12.1	1.6
	Maximum	32.4	3.7	21.8	6.25	0.61	0.49	0.12	0.59	1.58	-	26.4	13.4
	Count	7	7	7	7	7	7	7	7	7	0	7	7
ORE													
DA 0087		46.1	17	28.8	2.66	0.55	0.01	0.55	1.21	-	-	20.2	1.2
DA 0351		50.7	17	33.9	3.01	0.54	0.01	0.54	1.39	-	-	23.2	1.4
DA 0398		13.9	12	2.07	1.18	0.38	0.02	0.36	1.03	-	-	17.2	1.5
DA 0402		52.7	14	38.8	3.80	0.44	0.01	0.43	2.46	-	-	41.1	3.0
DA 0577		60.5	31	29.8	1.97	0.98	0.02	0.96	1.79	-	-	29.9	1.0
DA 7399		45.2	17	28.0	2.63	0.55	0.01	0.54	1.57	-	-	26.2	1.5
DA 7278		83.5	17	66.3	4.86	0.55	0.01	0.55	3.27	-	-	54.5	3.2
DA 0898		65.4	4.3	61.1	15.4	0.14	0.01	0.13	2.33	-	-	38.8	9.1
DA 8157		30.5	7.2	23.3	4.23	0.23	0.01	0.22	0.81	-	-	13.4	1.9
	Minimum	13.9	4.3	2.07	1.18	0.14	0.01	0.13	0.81	-	-	13.4	1.0
	Maximum	83.5	31	66.3	15.4	0.98	0.02	0.96	3.27	-	-	54.5	9.1
	Count	9	9	9	9	9	9	9	9	0	0	9	9

Note:
A value equal to the instrument detection limit was used in statistical calculations when a non-detect value was encountered.

0.4	Indicates an NP/AP or CaNP/AP ratio <4

(1) the percent sulphide concentrations for TWT, TWM, TET, TEB, TWB CNFeed, and CN1 CND1-7 Solids were calculated based on the difference between total sulphur and acid Leachable sulphate

Table 6
Summary of Short Term Leach Results

Sample #	Statistics	pH (units)	Alkalinity (mg/L as CaCO3)	Acidity (mg/L as CaCO3)	SO_4 (mg/L)	Cl (mg/L)	Hg (mg/L)	Al (mg/L)	As (mg/L)	Ag (mg/L)	Ba (mg/L)
ARGILLITE (5-45% GREYWACKE)											
	Minimum	7.58	35	2	11.0	2.0	0.0001	0.07	0.01	0.0001	0.14
	Maximum	8.33	45	2	110	2.1	0.0001	0.32	0.10	0.0001	0.31
	Average	7.80	38	2	47.7	2.0	0.0001	0.17	0.06	0.0001	0.24
	Standard Deviation	N/A	5.8	0	54.3	0.1	0	0.13	0.05	0	0.08
	Median	7.79	35	2	22.0	2.0	0.0001	0.12	0.09	0.0001	0.28
	Count	3	3	3	3	3	3	3	3	3	3
ARGILLITE (<5% GREYWACKE)											
	Minimum	7.38	28	2	6.50	2.0	0.0001	0.03	0.01	0.0001	0.10
	Maximum	8.30	56	2	100	3.5	0.0001	0.84	1.25	0.0001	0.57
	Average	7.78	36	2	28.3	2.3	0.0001	0.41	0.22	0.0001	0.30
	Standard Deviation	N/A	7.2	0	30.6	0.5	0	0.20	0.37	0	0.10
	Median	7.84	33	2	15.0	2.0	0.0001	0.40	0.06	0.0001	0.31
	Count	17	17	17	17	17	17	17	17	17	17
COMPOSITE											
	Minimum	7.65	29	2	8.40	2.0	0.0001	0.20	0.02	0.0001	0.14
	Maximum	8.03	39	2	46.0	2.3	0.0001	0.37	0.10	0.0001	0.34
	Average	7.75	32	2	30.5	2.2	0.0001	0.26	0.06	0.0001	0.22
	Standard Deviation	N/A	4.0	0	14.1	0.2	0	0.06	0.03	0	0.08
	Median	7.73	31	2	35.0	2.2	0.0001	0.23	0.05	0.0001	0.22
	Count	5	5	5	5	5	5	5	5	5	5
GREYWACKE (20%-50% ARGILLITE INTERBEDS)											
	Minimum	8.05	35	2	6.00	2.0	0.0001	0.24	0.00	0.0001	0.26
	Maximum	8.05	56	2	66.0	2.8	0.0001	0.31	0.35	0.0001	0.35
	Average	8.05	46	2	36.0	2.4	0.0001	0.28	0.18	0.0001	0.30
	Standard Deviation	N/A	15	0	42.4	0.6	0	0.05	0.25	0	0.07
	Median	8.05	46	2	36.0	2.4	0.0001	0.28	0.18	0.0001	0.30
	Count	2	2	2	2	2	2	2	2	2	2
GREYWACKE (<20% ARGILLITE INTERBEDS)											
	Minimum	7.59	38	2	8.00	2.0	0.0001	0.39	0.03	0.0001	0.27
	Maximum	8.16	40	2	28.0	3.6	0.0001	0.68	0.21	0.0001	0.49
	Average	7.80	39	2	14.9	2.8	0.0001	0.52	0.09	0.0001	0.35
	Standard Deviation	N/A	1.2	0	11.4	0.8	0	0.15	0.10	0	0.12
	Median	7.83	38	2	8.70	2.8	0.0001	0.49	0.04	0.0001	0.30
	Count	3	3	3	3	3	3	3	3	3	3
MARGINAL ORE											
	Minimum	7.65	27	2	9.00	2.0	0.0001	0.17	0.04	0.0001	0.13
	Maximum	7.91	42	2	67.0	2.0	0.0001	1.26	0.06	0.0001	0.49
	Average	7.76	35	2	28.7	2.0	0.0001	0.59	0.06	0.0001	0.31
	Standard Deviation	N/A	7.6	0	33.2	0.0	0	0.58	0.02	0	0.18
	Median	7.75	37	2	10.0	2.0	0.0001	0.32	0.06	0.0001	0.30
	Count	3	3	3	3	3	3	3	3	3	3
OVERALL STATISTICS (WASTE ROCK AND MARGINAL ORE)											
	Overall Minimum	7.38	27	2	6.00	2.0	0.0001	0.03	0.00	0.0001	0.10
	Overall Maximum	8.33	56	2	110	3.6	0.0001	1.26	1.25	0.0001	0.57
	Overall Average	7.84	36	2	29.7	2.3	0.0001	0.39	0.15	0.0001	0.29
	Overall Standard Deviation	0.22	7.1	0	29.4	0.5	0	0.24	0.28	0	0.11
	Overall Median	7.83	35	2	18.0	2.0	0.0001	0.36	0.06	0.0001	0.30
	Overall Count	33	33	33	33	33	33	33	33	33	33
Tailings											
TWT		8.61	-	-	-	-	0.0001	0.01	0.05	0.0001	0.20
TWM		8.51	-	-	-	-	0.0001	0.00	0.05	0.0001	0.17
TET		8.73	-	-	-	-	0.0001	0.01	0.17	0.0001	0.20
TEB		8.70	-	-	-	-	0.0001	0.01	0.10	0.0001	0.20
TWB CN Feed		8.48	-	-			0.0001	0.02	0.11	0.0001	0.24
CN1 CND 1-7 Solids (TWB)		9.03	-	-	-	-	0.0001	0.02	0.27	0.0001	0.20
	Minimum	8.48	-	-	-	-	0.0001	0.00	0.05	0.0001	0.17
	Maximum	9.03	-	-	-	-	0.0001	0.02	0.27	0.0001	0.24
	Count	6	0	0	0	0	6	6	6	6	6
MMER Guidelines (Max. Authorized Monthly Mean Conc.)		-	-	-	-	-	-	-	0.50	-	-
CCME Guidelines (Protection of freshwater aquatic life)		6.5-9.0	-	-	-	-	0.0001	0.005-0.1	0.01	0.0001	-

Sample #	Statistics	Be (mg/L)	Bi (mg/L)	Ca (mg/L)	Cd (mg/L)	Co (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Li (mg/L)	K (mg/L)	Mg (mg/L)
ARGILLITE (5-45% GREYWACKE)												
	Minimum	0.0004	0.00002	8.26	0.00006	0.00004	0.001	0.0002	0.01	0.002	8.80	1.66
	Maximum	0.0004	0.00002	42.0	0.00006	0.00011	0.001	0.0007	0.08	7.050	13.1	6.21
	Average	0.0004	0.00002	20.8	0.00006	0.00006	0.001	0.0004	0.03	0.865	10.4	3.46
	Standard Deviation	0	0	18.4	0	0.00004	0	0.0003	0.03	1.182	2.40	2.42
	Median	0.0004	0.00002	12.2	0.00006	0.00005	0.001	0.0004	0.03	0.002	9.39	2.51
	Count	3	3	3	3	3	3	3	3	3	3	3
ARGILLITE (<5% GREYWACKE)												
	Minimum	0.0004	0.00002	6.07	0.00006	0.00001	0.001	0.0002	0.01	0.002	7.68	0.69
	Maximum	0.0004	0.00011	39.7	0.00006	0.00048	0.005	0.0010	0.43	0.002	16.7	8.37
	Average	0.0004	0.00003	14.0	0.00006	0.00009	0.001	0.0005	0.12	0.002	11.4	2.66
	Standard Deviation	0	0.00002	9.62	0	0.00011	0.001	0.0002	0.12	0.000	3.04	2.05
	Median	0.0004	0.00002	9.80	0.00006	0.00007	0.001	0.0006	0.06	0.002	10.5	1.69
	Count	17	17	17	17	17	17	17	17	17	17	17
COMPOSITE												
	Minimum	0.0004	0.00002	7.73	0.00006	0.00001	0.001	0.0002	0.01	0.002	7.69	1.26
	Maximum	0.0004	0.00002	21.9	0.00006	0.00017	0.001	0.0005	0.13	0.002	12.9	2.81
	Average	0.0004	0.00002	14.7	0.00006	0.00006	0.001	0.0003	0.04	0.002	9.40	2.06
	Standard Deviation	0	0	5.39	0	0.00006	0	0.0001	0.05	0.000	2.16	0.55
	Median	0.0004	0.00002	15.3	0.00006	0.00004	0.001	0.0003	0.02	0.002	8.62	2.03
	Count	5	5	5	5	5	5	5	5	5	5	5
GREYWACKE (20%-50% ARGILLITE INTERBEDS)												
	Minimum	0.0004	0.00002	7.77	0.00006	0.00001	0.001	0.0002	0.03	0.002	7.01	0.87
	Maximum	0.0004	0.00002	10.3	0.00006	0.00001	0.001	0.0008	0.04	0.002	8.75	2.36
	Average	0.0004	0.00002	9.04	0.00006	0.00001	0.001	0.0005	0.03	0.002	7.88	1.62
	Standard Deviation	0	0	1.79	0	0	0	0.0004	0.01	0.000	1.23	1.05
	Median	0.0004	0.00002	9.04	0.00006	0.00001	0.001	0.0005	0.03	0.002	7.88	1.62
	Count	2	2	2	2	2	2	2	2	2	2	2
GREYWACKE (<20% ARGILLITE INTERBEDS)												
	Minimum	0.0004	0.00002	6.86	0.00006	0.00002	0.001	0.0001	0.02	0.002	6.63	1.00
	Maximum	0.0004	0.00002	13.7	0.00006	0.00020	0.001	0.0008	0.24	0.002	11.5	2.62
	Average	0.0004	0.00002	9.71	0.00006	0.00010	0.001	0.0004	0.12	0.002	9.25	1.69
	Standard Deviation	0	0	3.56	0	0.00008	0	0.0003	0.11	0.000	2.46	0.83
	Median	0.0004	0.00002	8.56	0.00006	0.00007	0.001	0.0004	0.11	0.002	9.61	1.46
	Count	3	3	3	3	3	3	3	3	3	3	3
MARGINAL ORE												
	Minimum	0.0004	0.00002	8.81	0.00006	0.00001	0.001	0.0002	0.01	0.002	9.08	1.24
	Maximum	0.0004	0.00002	26.4	0.00006	0.00028	0.001	0.0005	0.57	0.002	10.4	3.44
	Average	0.0004	0.00002	14.7	0.00006	0.00011	0.001	0.0004	0.20	0.002	9.64	2.04
	Standard Deviation	0	0	10.2	0	0.00015	0	0.0002	0.32	0.000	0.68	1.22
	Median	0.0004	0.00002	8.96	0.00006	0.00004	0.001	0.0004	0.01	0.002	9.44	1.44
	Count	3	3	3	3	3	3	3	3	3	3	3
OVERALL STATISTICS (WASTE ROCK AND MARGINAL ORE)												
	Overall Minimum	0.0004	0.00002	6.07	0.00006	0.00001	0.001	0.0001	0.01	0.002	6.63	0.87
	Overall Maximum	0.0004	0.00011	42.0	0.00006	0.00048	0.005	0.0010	0.57	2.050	16.7	8.37
	Overall Average	0.0004	0.00002	14.1	0.00006	0.00008	0.001	0.0004	0.10	0.064	10.4	2.43
	Overall Standard Deviation	0	0.00002	9.29	0	0.00009	0.001	0.0002	0.13	0.357	2.70	1.71
	Overall Median	0.0004	0.00002	10.3	0.00006	0.00005	0.001	0.0004	0.04	0.002	9.71	1.87
	Overall Count	33	33	33	33	33	33	33	33	33	33	33
Tailings												
TWT		0.0004	0.00002	21.1	0.00006	0.00004	0.001	0.0008	0.01	0.002	2.65	4.85
TWM		0.0004	0.00002	26.9	0.00006	0.00008	0.000	0.0005	0.01	0.002	3.25	6.18
TET		0.0004	0.00002	19.3	0.00006	0.00007	0.001	0.0007	0.01	0.002	3.53	3.67
TEB		0.0004	0.00002	19.3	0.00006	0.00004	0.000	0.0007	0.01	0.002	3.88	4.82
TWB CN Feed		0.0004	0.00002	19.7	0.00001	0.00018	0.001	0.0008	0.01	0.002	2.00	4.02
CN1 CND 1-7 Solids (TWB)		0.0004	0.00002	16.5	0.00001	0.01580	0.001	0.0029	0.21	0.002	2.98	1.42
	Minimum	0.0004	0.00002	16.5	0.00001	0.00004	0.000	0.0005	0.01	0.002	2.00	1.42
	Maximum	0.0004	0.00002	26.9	0.00006	0.01580	0.001	0.0029	0.21	0.002	3.88	6.18
	Count	6	6	6	6	6	6	6	6	6	6	6
MMER Guidelines (Max. Authorized Monthly Mean Conc.)		-	-	-	-	-	-	0.3000	-	-	-	-
CCME Guidelines (Protection of freshwater aquatic life)		-	-	-	0.00002	-	-	0.002-0.004	0.30	-	-	-

Sample #	Statistics	Mn (mg/L)	Mo (mg/L)	Na (mg/L)	Ni (mg/L)	Pb (mg/L)	P (mg/L)	Sb (mg/L)	S (mg/L)	Se (mg/L)	Sr (mg/L)	Ti (mg/L)	V (mg/L)	W (mg/L)	Zn (mg/L)
ARGILLITE (5-45% GREYWACKE)															
	Minimum	0.003	0.0012	5.85	0.0010	0.0005	0.01	0.0014	4.54	0.003	0.031	0.0006	0.0003	0.0002	0.0054
	Maximum	0.081	0.0080	9.87	0.0029	0.0007	0.73	0.3000	47.0	0.003	0.089	0.0024	0.0013	0.0046	0.0396
	Average	0.035	0.0035	7.62	0.0019	0.0006	0.25	0.1016	20.3	0.003	0.045	0.0016	0.0007	0.0019	0.0178
	Standard Deviation	0.048	0.0039	2.06	0.0010	0.0001	0.42	0.1718	23.3	0	0.021	0.0009	0.0006	0.0023	0.0188
	Median	0.011	0.0013	7.14	0.0017	0.0005	0.01	0.0034	9.35	0.003	0.034	0.0017	0.0004	0.0010	0.0085
	Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3
ARGILLITE (<5% GREYWACKE)															
	Minimum	0.001	0.0003	3.98	0.0007	0.0005	0.01	0.0010	2.50	0.003	0.019	0.0002	0.0001	0.0002	0.0050
	Maximum	0.126	0.0092	9.25	0.0060	0.0012	0.02	0.0277	47.4	0.003	0.113	0.0080	0.0022	0.0019	0.0753
	Average	0.020	0.0012	6.73	0.0021	0.0006	0.01	0.0040	12.8	0.003	0.036	0.0036	0.0010	0.0006	0.0268
	Standard Deviation	0.034	0.0021	1.38	0.0014	0.0002	0.00	0.0082	11.7	0	0.027	0.0027	0.0006	0.0006	0.0260
	Median	0.006	0.0006	6.46	0.0017	0.0007	0.01	0.0018	7.22	0.003	0.025	0.0026	0.0010	0.0004	0.0067
	Count	17	17	17	17	17	17	17	17	17	17	17	17	17	17
COMPOSITE															
	Minimum	0.002	0.0004	5.69	0.0009	0.0004	0.01	0.0009	3.81	0.003	0.026	0.0006	0.0003	0.0003	0.0060
	Maximum	0.012	0.0013	8.88	0.0024	0.0015	0.03	0.0038	21.1	0.003	0.058	0.0055	0.0012	0.0006	0.0524
	Average	0.007	0.0008	7.58	0.0014	0.0009	0.01	0.0024	13.6	0.003	0.040	0.0022	0.0008	0.0004	0.0157
	Standard Deviation	0.005	0.0004	1.66	0.0008	0.0004	0.01	0.0011	8.24	0	0.016	0.0020	0.0004	0.0001	0.0205
	Median	0.006	0.0007	8.77	0.0013	0.0007	0.01	0.0028	14.6	0.003	0.031	0.0013	0.0007	0.0003	0.0070
	Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5
GREYWACKE (20%-50% ARGILLITE INTERBEDS)															
	Minimum	0.002	0.0008	6.81	0.0007	0.0008	0.01	0.0011	3.22	0.003	0.030	0.0008	0.0005	0.0003	0.0046
	Maximum	0.010	0.0011	8.13	0.0008	0.0012	0.01	0.0017	9.79	0.003	0.031	0.0035	0.0023	0.0006	0.0066
	Average	0.006	0.0010	7.47	0.0007	0.0010	0.01	0.0014	6.50	0.003	0.030	0.0022	0.0014	0.0004	0.0056
	Standard Deviation	0.006	0.0002	0.93	0.0001	0.0003	0.00	0.0004	4.65	0	0.001	0.0018	0.0013	0.0002	0.0014
	Median	0.006	0.0010	7.47	0.0007	0.0010	0.01	0.0014	6.50	0.003	0.030	0.0022	0.0014	0.0004	0.0056
	Count	2	2	2	2	2	2	2	2	2	2	2	2	2	2
GREYWACKE (<20% ARGILLITE INTERBEDS)															
	Minimum	0.002	0.0004	6.85	0.0007	0.0005	0.01	0.0013	3.27	0.003	0.027	0.0012	0.0014	0.0008	0.0060
	Maximum	0.011	0.0014	11.8	0.0007	0.0013	0.01	0.0032	14.0	0.003	0.035	0.0189	0.0035	0.0013	0.0849
	Average	0.006	0.0008	9.82	0.0007	0.0008	0.01	0.0020	7.14	0.003	0.031	0.0086	0.0025	0.0010	0.0607
	Standard Deviation	0.005	0.0005	2.62	0.0000	0.0004	0.00	0.0010	5.86	0	0.004	0.0092	0.0010	0.0003	0.0405
	Median	0.006	0.0006	10.8	0.0007	0.0007	0.01	0.0015	4.16	0.003	0.030	0.0057	0.0025	0.0010	0.0612
	Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MARGINAL ORE															
	Minimum	0.001	0.0003	3.96	0.0007	0.0005	0.01	0.0010	4.77	0.003	0.021	0.0005	0.0003	0.0003	0.0034
	Maximum	0.063	0.0006	7.88	0.0035	0.0008	0.01	0.0013	28.3	0.003	0.044	0.0308	0.0022	0.0005	0.0695
	Average	0.024	0.0004	6.45	0.0018	0.0006	0.01	0.0011	12.8	0.003	0.029	0.0108	0.0010	0.0004	0.0268
	Standard Deviation	0.034	0.0001	2.17	0.0015	0.0001	0.00	0.0002	13.5	0	0.013	0.0173	0.0010	0.0001	0.0370
	Median	0.007	0.0004	7.52	0.0012	0.0006	0.01	0.0011	5.21	0.003	0.023	0.0011	0.0007	0.0004	0.0078
	Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3
OVERALL STATISTICS (WASTE ROCK AND MARGINAL ORE)															
	Overall Minimum	0.001	0.0003	3.96	0.0007	0.0004	0.01	0.0009	2.50	0.003	0.019	0.0002	0.0001	0.0002	0.0034
	Overall Maximum	0.126	0.0092	11.8	0.0060	0.0015	0.73	0.3000	47.0	0.003	0.113	0.0308	0.0035	0.0046	0.0849
	Overall Average	0.018	0.0013	7.24	0.0017	0.0008	0.03	0.0120	12.7	0.003	0.036	0.0042	0.0011	0.0008	0.0252
	Overall Standard Deviation	0.030	0.0019	1.80	0.0012	0.0003	0.13	0.0518	11.5	0	0.022	0.0060	0.0008	0.0008	0.0266
	Overall Median	0.006	0.0006	6.85	0.0013	0.0007	0.01	0.0016	9.35	0.003	0.030	0.0020	0.0010	0.0004	0.0070
	Overall Count	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Tailings															
TWT		0.037	0.0044	10.2	0.0007	0.0001	-	0.0008	-	0.001	0.057	0.0004	0.0004	0.0002	0.0048
TWM		0.063	0.0047	9.57	0.0008	0.0001	-	0.0011	-	0.001	0.071	0.0004	0.0002	0.0002	0.0031
TET		0.018	0.0032	10.6	0.0007	0.0002	-	0.0027	-	0.001	0.052	0.0008	0.0008	0.0002	0.0040
TEB		0.028	0.0030	8.83	0.0007	0.0001	-	0.0016	-	0.001	0.053	0.0008	0.0005	0.0002	0.0036
TWB CN Feed		0.041	0.0107	11.0	0.0021	0.0001	-	0.0066	-	0.001	0.083	0.0007	0.0003	0.0002	0.0051
CN1 CND 1-7 Solids (TWB)		0.003	0.0041	53.9	0.0020	0.0000	-	0.0057	-	0.001	0.050	0.0017	0.0012	0.0121	0.0033
	Minimum	0.003	0.0030	9.57	0.0007	0.0000	-	0.0008	-	0.001	0.050	0.0004	0.0002	0.0002	0.0031
	Maximum	0.063	0.0107	53.9	0.0021	0.0002	-	0.0066	-	0.001	0.083	0.0017	0.0012	0.0121	0.0051
	Count	6	6	6	6	6	0	6	0	6	6	6	6	6	6
MMER Guidelines (Max. Authorized Monthly Mean Conc.)		-	-	-	0.5000	0.2000	-	-	-	-	-	-	-	-	0.5000
CCME Guidelines (Protection of freshwater aquatic life)		-	0.0730	-	0.025-0.15	0.001-0.007	-	-	-	0.001	-	-	-	-	0.0300

Note:
A value equal to the instrument detection limit was used in statistical calculations when a non-detect value was encountered.

0.57	Indicates a value elevated relative to CCME guideline value
1.26	Indicates a value elevated relative to MMER and CCME guideline values

CCME and MMER values provided only as basis of comparison, values above guidelines require further evaluation

Table 7
Net Acid Generation Results

Sample #	Location	NAG	ABA	Water Quality																									
		Final pH		Al	As	Ag	Ba	Be	B	Bi	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Se	Sn	Sr	Ti	Tl	U	V	W	Y	Zn
		pH units	NP/AP	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				0.005	0.005	0.0001					0.000017			0.002	0.3		0.073	0.025	0.001	0.001				0.0008					0.03
ARGILLITE (5-49%) GREYWACKE																													
06-082	Western Pit	9.01	3.6	0.09	0.241	< 0.0001	0.0767	< 0.0004	0.149	< 0.00002	< 0.00006	3.7E-05	0.0007	0.0027	< 0.01	0.001	0.0022	< 0.0007	0.0002	< 0.001	< 0.0003	0.0457	0.0004	< 0.0001	< 0.00002	0.0010	0.0009	< 0.000005	0.0024
ARGILLITE (<5% GREYWACKE)																													
06-005	Central Pit	10.11	5.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-009	Central Pit	10.43	3.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-014	Central Pit	8.38	3.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-019	Central Pit	10.36	5.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-029	Central Pit	10.45	37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-031	Central Pit	10.8	8.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-036	Central Pit	7.03	2.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-038	Central Pit	7.67	4.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-049	Eastern Pit	10.34	4.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-053	Eastern Pit	10.5	6.5	1.06	0.0027	< 0.0001	0.0771	< 0.0004	0.227	< 0.00002	< 0.00006	3.4E-05	0.0077	1E-04	< 0.01	< 0.001	0.0010	< 0.0007	8E-05	< 0.001	< 0.0003	0.0786	0.0003	< 0.0001	0.00003	0.0093	0.0008	0.000005	0.0011
06-067	Western Pit	*2.89*	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-071	Western Pit	7.26	2.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-073	Western Pit	6.85	2.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-076	Western Pit	*3.09*	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-077	Western Pit	8.12	3.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-078	Western Pit	10.78	12	0.70	0.0067	< 0.0001	0.089	< 0.0004	0.272	< 0.00002	< 0.00006	2.1E-05	0.0064	< 0.0001	< 0.01	< 0.001	0.0019	< 0.0007	1E-04	< 0.001	< 0.0003	0.0964	0.0004	< 0.0001	< 0.00002	0.0088	0.0008	0.000005	0.0008
06-079	Western Pit	*3.14*	1.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-080	Western Pit	*2.57*	0.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-083	Western Pit	*2.78*	<1	4.87	2.0300	0.0003	0.0457	0.0008	0.710	< 0.00002	0.00121	0.211	0.0026	0.4940	3.1500001	5.370	0.0003	0.3680	0.0047	0.004	< 0.0003	0.215	0.0009	0.0001	0.00085	0.0008	0.00006	0.010402	0.8950
COMPOSITE																													
06-035	Central Pit	10.86	7.7	1.43	0.0027	< 0.0001	0.0949	< 0.0004	0.258	< 0.00002	< 0.00006	1.9E-05	0.0079	0.0002	< 0.01	< 0.001	0.0038	< 0.0007	0.0001	< 0.001	< 0.0003	0.116	0.0003	< 0.0001	< 0.00002	0.0094	0.0015	< 0.000005	0.0013
06-070	Western Pit	8.45	2.4	0.58	0.0795	< 0.0001	0.0879	< 0.0004	0.249	< 0.00002	< 0.00006	2.3E-05	0.0058	< 0.0001	0.01	< 0.001	0.0063	< 0.0007	0.0002	< 0.001	< 0.0003	0.0191	0.0007	< 0.0001	0.00005	0.0076	0.0006	0.000023	0.0008
GREYWACKE (20%-60% ARGILLITE INTERBEDS)																													
06-001	Central Pit	9.35	4.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-024	Central Pit	11.26	19	2.11	0.0136	< 0.0001	0.255	< 0.0004	0.144	< 0.00002	< 0.00006	1.7E-05	0.008	0.0002	< 0.01	< 0.001	0.0018	< 0.0007	0.0002	< 0.001	< 0.0003	0.0979	0.0005	< 0.0001	< 0.00002	0.0066	0.0005	0.000012	0.0036
06-039	Central Pit	8.09	2.1	0.01	4.7200	< 0.0001	0.121	< 0.0004	0.173	< 0.00002	< 0.00006	4.9E-05	0.0059	< 0.0001	< 0.01	0.002	0.0045	< 0.0007	0.0002	0.001	< 0.0003	0.0762	0.0005	< 0.0001	< 0.00002	0.0044	0.0011	< 0.000005	0.031
GREYWACKE (<20% ARGILLITE INTERBEDS)																													
06-065	Western Pit	11.35	35	0.89	0.0166	< 0.0001	0.1870	< 0.0004	0.165	< 0.00002	< 0.00006	2.8E-05	0.0056	< 0.0001	0.01	0.001	0.0024	< 0.0007	0.0001	< 0.001	0.0003	0.103	0.0007	< 0.0001	0.00003	0.0074	0.0004	0.000035	0.0018
06-066	Western Pit	10.36	5.0	0.81	0.3330	< 0.0001	0.0686	< 0.0004	0.212	< 0.00002	< 0.00006	2E-05	0.0063	< 0.0001	< 0.01	< 0.001	0.0096	< 0.0007	9E-05	< 0.001	< 0.0003	0.0885	0.0005	< 0.0001	0.00002	0.0079	0.0010	< 0.000005	0.0011
06-075	Western Pit	9.81	6.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MARGINAL ORE																													
06-008	Marginal Ore	9.54	3.0	0.57	0.0248	< 0.0001	0.113	< 0.0004	0.437	< 0.00002	< 0.00006	2E-05	0.0024	0.0002	< 0.01	< 0.001	0.0016	< 0.0007	0.0002	< 0.001	< 0.0003	0.0491	0.0004	< 0.0001	< 0.00002	0.0023	0.0005	0.000007	0.0011
06-086	Marginal Ore	9.5	3.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-087	Marginal Ore	10.46	6.6	0.67	0.0071	< 0.0001	0.0625	< 0.0004	0.396	< 0.00002	< 0.00006	2E-05	0.0028	1E-04	< 0.01	< 0.001	0.0006	< 0.0007	1E-04	< 0.001	< 0.0003	0.0554	0.0004	< 0.0001	< 0.00002	0.0019	0.0003	< 0.000005	0.001
06-093	Marginal Ore	7.2	2.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
QUARTZ VEIN																													
06-037	Central Pit	8.95	2.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
OVERALL STATISTICS (WASTE ROCK AND MARGINAL ORE)																													
Overall Minimum		2.6	0.4	0.01	0.0027	0	0.0457	0	0.14399999	0	0	0.000017	0.0007	0	0	0	0.0003	0	0.0001	0	0	0.0191	0.0003	0	0	0.00061	0.00006	0.000000	0.0008
Overall Maximum		11.4	37.0	4.87	4.7200	0.00030	0.25	0.00	0.71	0.00	0.0012	0.21	0.01	0.49	3.15	5.37	0.0096	0.37	0.0047	0.004	0.00	0.22	0.00	0.0001	0.00	0.01	0.00	0.01	0.895
Overall Average		8.4	6.4	1.15	0.6232	0.00003	0.11	0.00	0.28	0.00	0.0001	0.02	0.01	0.04	0.26	0.45	0.0030	0.03	0.0005	0.0004	0.00	0.08	0.00	0.000008	0.00	0.01	0.00	0.00	0.078
Overall Standard Deviation		2.70	6.38	1.30	1.4115	0.00009	0.06	0.00	0.16	0.00	0.00035	0.06	0.00	0.14	0.91	1.55	0.0027	0.11	0.0013	0.0012	0.00	0.05	0.00	0.00003	0.00	0.00	0.00	0.00	0.257
Overall Median		8.4	3.7	0.75	0.0208	0	0.06825	0	0.238	0	0	0.00002	0.00585	0.0001	0	0	0.002	0	0.0001	0	0	0.0875	0.00045	0	0.00000	0.006615	0.00076	0.000005	0.0012
Overall Count		33	33	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Tailings																													
TWT	—	9.10	2.6	0.83	0.8990	< 0.00003	0.00152	< 0.00004	0.040	< 0.00002	< 0.00006	0.000106	0.014	0.0006	0.02	0.00037	0.0060	0.001	< 0.00002	< 0.001	< 0.0003	0.0782	0.0009	< 0.0001	0.00004	0.0159	—	—	< 0.0003
TWM	—	9.40	3.1	0.70	0.1770	< 0.00003	0.00123	< 0.00004	0.078	< 0.00002	< 0.00006	8E-05	0.019	0.0005	0.02	0.00027	0.0039	0.0008	< 0.00002	< 0.001	< 0.0003	0.092	0.0008	< 0.0001	0.00002	0.0170	—	—	0.0013
TET	—	10.00	4.7	3.50	0.1920	< 0.00003	0.00078	< 0.00004	0.136	< 0.00002	< 0.00006	4.7E-05	0.0176	0.0005	0.01	< 0.00004	0.0029	< 0.0007	< 0.00002	< 0.001	< 0.0003	0.0598	0.0008	< 0.0001	< 0.00002	0.0182	—	—	< 0.0003
TEB	—	9.97	3.7	2.78	0.3140	< 0.00003	0.00126	< 0.00004	0.151	< 0.00002	< 0.00006	4.5E-05	0.0181	0.0004	0.01	4E-05	0.0040	< 0.0007	< 0.00002	< 0.001	< 0.0003	0.084	0.0007	0.002	0.00002	0.0217	—	—	0.0010
TWB CN Feed	—	7.5	1.6	0.09	0.5110	< 0.00003	0.00375	< 0.00004	0.037	< 0.00002	< 0.00006	0.000383	< 0.0003	< 0.0001	0.04	0.0248	0.0064	0.0014	0.0002	0.001	0.0011	0.0951	0.0011	< 0.0001	< 0.00002	0.0015	—	—	0.0020
CN1 CND 1-7 Solids (TWB)	—	9.03	3.3	0.02	0.2720	< 0.0001	0.196	< 0.0004	0.561	< 0.00002	< 0.00001	0.0159	0.0007	0.0029	0.20999999	0.0027	0.0041	0.002	4E-05	< 0.001	0.0006	0.0504	0.0017	< 0.0001	0.00037	0.0012	0.0121	0.000021	0.0033

Notes:

1.0	Net Acid Generating
<4	There is uncertainty as to the potential for acid generation.
<2	There is a low potential for acid generation.
<1	There is a potential for acid generation.
1.0	Indicates a value that is elevated relative to the CCME guideline.
—	Indicates the parameter was not analyzed

Summary of CND 2 Treated Solids (Master Composite) Tailings Supernatant Water Aging Results

Parameter	Units	MMER Guidelines (mg/L)	CCME	Day 0	Day 3	Day 7	Day 14	Day 45
General Parameters								
Temperature Upon Receipt	°C	-	-	21	20.5	18.5	18	20.5
Total Suspended Solids	mg/L	15.00	-	***116***	***136***	***29 UAL***	***32 UAL***	***42***
Conductivity	uS/cm	-	-	2200	2520	2440	2480	2620
pH	units	-	6.5-9	7.97	7.76	7.79	7.92	8.03
Alkalinity	mg/L as $CaCO_3$	-	-	65	56	63	73	118
Cl	mg/L	-	-	13	13	13	13	14
SO4	mg/L	-	-	970	1100	1100	1200	1100
Nutrients								
NO2	as N mg/L	-	0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.6
NO3	as N mg/L	-	-	0.05	0.06	0.06	< 0.05	< 0.5
NH3+NH4	as N mg/L	-	-	29.3	45.8	3.1	26.5	37.3
Total Metals								
Hg	mg/L	-	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001	0.0002
Ag	mg/L	-	0.0001	0.00032	< 0.00003	< 0.00003	< 0.00003	0.00005
Al	mg/L	-	0.1	2.14	1.68	0.496	0.63	0.758
As	mg/L	0.50	0.005	0.469	0.448	0.353	0.242	0.219
B	mg/L	-	-	0.026	0.029	0.051	0.035	< 0.05
Ba	mg/L	-	-	0.0268	0.0409	0.0339	0.0362	0.0376
Be	mg/L	-	-	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004
Bi	mg/L	-	-	0.00006	< 0.00002	< 0.00002	< 0.00002	0.00003
Ca	mg/L	-	-	136	183	185	187	159
Cd	mg/L	-	0.000017	< 0.00006	< 0.00006	< 0.00006	0.00006	< 0.00006
Co	mg/L	-	-	0.2	0.216	0.25	0.22	0.186
Cr	mg/L	-	0.001	0.0059	0.0062	0.0055	0.0026	0.0021
Cu	mg/L	0.30	0.004	0.0474	0.0522	0.0397	0.0253	0.0249
Fe	mg/L	-	0.3	3.66	3.52	0.84	1.24	1.66
K	mg/L	-	-	22.5	22.3	21.3	21.3	27.1
Li	mg/L	-	-	0.0057	0.0062	0.0137	0.0062	0.0089
Mg	mg/L	-	-	5.05	6.22	6.92	7.68	13.4
Mn	mg/L	-	-	0.0773	0.0924	0.104	0.109	0.0739
Mo	mg/L	-	0.073	0.0231	0.024	0.0301	0.0262	0.0292
Na	mg/L	-	-	337	402	405	401	412
Ni	mg/L	0.50	0.025	0.0079	0.0087	0.0047	0.0047	0.0045
Pb	mg/L	0.20	0.001	0.00165	0.00184	0.00185	0.00104	0.00088
Sb	mg/L	-	-	0.016	0.0162	0.013	0.0133	0.0104
Se	mg/L	-	0.001	0.004	< 0.003	< 0.003	< 0.003	< 0.003
Sn	mg/L	-	-	< 0.0003	0.0017	0.002	< 0.002	0.0041
Sr	mg/L	-	-	0.279	0.343	0.366	0.373	0.41
Ti	mg/L	-	-	0.0088	0.0085	0.0027	0.0041	0.0044
Tl	mg/L	-	0.0008	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
U	mg/L	-	-	0.00486	0.00479	0.0053	0.00496	0.00605
V	mg/L	-	-	0.00258	0.00212	0.00142	0.00061	0.0012
W	mg/L	-	-	0.0346	0.031	0.0337	0.0335	0.0286
Y	mg/L	-	-	0.000547	0.000428	0.00014	0.000203	0.000186
Zn	mg/L	0.50	0.03	0.0077	0.0156	0.0146	0.0092	0.0053

Table 8

Summary of CND 2 Treated Solids (Master Composite) Tailings Supernatant Water Aging Results

Parameter	Units	MMER Guidelines (mg/L)	CCME	Day 0	Day 3	Day 7	Day 14	Day 45
Dissolved Metals								
Hg	mg/L	-	0.0001	< 0.0001	< 0.0001	0.0003	< 0.0001	0.0001
Ag	mg/L	-	0.0001	0.00015	0.00015	< 0.00003	< 0.00003	< 0.00003
Al	mg/L	-	0.1	0.158	0.0788	0.0847	0.0725	0.0982
As	mg/L	0.50	0.005	***0.532***	0.366	0.335	0.307	0.227
B	mg/L	-	-	0.03	0.032	0.027	0.027	< 0.05
Ba	mg/L	-	-	0.0259	0.036	0.0332	0.0347	0.0359
Be	mg/L	-	-	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004
Bi	mg/L	-	-	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Ca	mg/L	-	-	135	163	144	196	144
Cd	mg/L	-	0.000017	< 0.00006	< 0.00006	< 0.00006	< 0.00006	< 0.00006
Co	mg/L	-	-	0.183	0.186	0.218	0.205	0.182
Cr	mg/L	-	0.001	0.0031	0.0032	0.003	0.0025	0.0012
Cu	mg/L	0.30	0.004	0.0337	0.0335	0.0293	0.0252	0.0194
Fe	mg/L	-	0.3	0.08	0.11	0.08	0.07	0.11
K	mg/L	-	-	17.7	22	18.6	21.6	23.7
Li	mg/L	-	-	0.0038	0.0058	0.0054	0.0051	0.0049
Mg	mg/L	-	-	4.16	5.25	5.93	7.76	11.6
Mn	mg/L	-	-	0.0238	0.046	0.0615	0.105	0.0567
Mo	mg/L	-	0.073	0.0222	0.0237	0.0224	0.0234	0.0277
Na	mg/L	-	-	378	368	376	401	377
Ni	mg/L	0.50	0.025	0.0063	0.0038	0.0037	0.0048	0.0035
Pb	mg/L	0.20	0.001	0.00003	0.00015	0.00025	0.00011	0.00022
Sb	mg/L	-	-	0.0178	0.0163	0.014	0.014	0.0103
Se	mg/L	-	0.001	0.004	0.003	0.003	< 0.003	< 0.003
Sn	mg/L	-	-	< 0.0003	0.0017	0.0068	< 0.002	0.0037
Sr	mg/L	-	-	0.301	0.319	0.331	0.372	0.379
Ti	mg/L	-	-	0.0008	< 0.0002	0.0007	0.0005	0.0099
Tl	mg/L	-	0.0008	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
U	mg/L	-	-	0.00437	0.0045	0.00481	0.00487	0.00549
V	mg/L	-	-	0.00114	0.00084	0.00065	0.00072	0.0007
W	mg/L	-	-	0.0303	0.0306	0.0322	0.0264	0.0253
Y	mg/L	-	-	0.00001	0.000018	0.000013	0.000033	0.000028
Zn	mg/L	0.50	0.03	0.0041	0.0052	0.0062	0.0079	0.0023
Other Parameters								
Thiosalts	as S_2O_3 mg/L	-	-	< 10	< 10	< 10	< 20	< 10
CN(T)	mg/L	1.00	-	0.32	0.32	0.2	0.18	0.17
CN(F)	mg/L	-	0.005	< 0.03	< 0.05	< 0.04	< 0.04	< 0.04
CNWAD	mg/L	-	-	0.03	0.04	0.03	0.04	0.04

Notes:

1.0	Indicates a value that is elevated relative to the CCME guideline.
1.0	Indicates a value that is elevated relative to the MMER and CCME (if present) guideline values.

CCME and MMER values provided only as basis of comparison, values above guidelines require further evaluation.

Summary of CN1 CND 1-7 Solids (TWB) Tailings Supernatant Water Aging Results

Parameter	Units	MMER Guidelines (mg/L)	CCME	Day 0	Day 1	Day 3	Day 7	Day 15	Day 30	Day 44
General Parameters										
Temperature Upon Receipt	°C	-	-	17.5	-	4.5	5	19	20	21
Total Suspended Solids	mg/L	15.00	-	***241***	5	< 3	4	6	4	< 2
Conductivity	uS/cm	-	-	2570	2660	2620	2540	2590	2610	2460
pH	units	-	6.5-9	7.9	8.12	8.04	8.07	8.02	8.36	8.06
Alkalinity	mg/L as $CaCO_3$	-	-	86	94	97	97	105	267	115
Cl	mg/L	-	-	20	120	20	21	21	20	20
SO4	mg/L	-	-	1000	1000	920	900	1000	980	940
Nutrients										
NO2	as N mg/L	-	0.06	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.60	< 0.06
NO3	as N mg/L	-	-	< 0.5	0.5	< 0.5	< 0.5	0.3	0.34	1.03
NH3+NH4	as N mg/L	-	-	64.1	3.9	4.2	5	5.5	8.4	10.8
Total Metals										
Hg	mg/L	-	0.0001	0.0009	0.001	0.0011	0.0015	0.0006	0.0004	0.0002
Ag	mg/L	-	0.0001	0.00034	0.00521	0.00052	0.00069	0.00019	0.00006	< 0.002
Al	mg/L	-	0.1	4.85	0.214	0.0884	0.0998	0.115	0.12	0.0569
As	mg/L	0.50	0.005	0.381	***0.872***	0.337	0.325	0.317	0.26	0.283
B	mg/L	-	-	0.057	0.065	0.047	0.046	0.046	0.046	0.048
Ba	mg/L	-	-	0.0381	0.0395	0.0394	0.0393	0.0379	0.0388	0.0332
Be	mg/L	-	-	6E-05	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004
Bi	mg/L	-	-	0.00007	< 0.00002	0.00002	< 0.00002	0.00013	< 0.00002	0.00003
Ca	mg/L	-	-	166	160	160	160	156	157	138
Cd	mg/L	-	0.000017	< 0.00001	0.0001	0.0001	0.0001	0.00023	< 0.00001	< 0.00001
Co	mg/L	-	-	0.226	0.227	0.196	0.202	0.22	0.202	0.212
Cr	mg/L	-	0.001	0.0081	0.002	< 0.004	0.0012	0.0018	0.0008	< 0.002
Cu	mg/L	0.30	0.004	***1.42***	***1.37***	***1.22***	***0.896***	0.215	0.0872	0.0555
Fe	mg/L	-	0.3	10.1	0.3	0.08	0.13	0.2	22.7	0.02
K	mg/L	-	-	31.5	32.5	32.4	25.5	21.7	28.7	28.4
Li	mg/L	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Mg	mg/L	-	-	10.90	7.89	7.95	8.18	8.60	9.73	9.45
Mn	mg/L	-	-	0.1810	0.0940	0.0892	0.0955	0.1130	0.0965	0.0708
Mo	mg/L	-	0.073	0.0589	0.0541	0.0573	0.0548	0.0528	0.0563	0.34
Na	mg/L	-	-	400	561	552	399	500	393	375
Ni	mg/L	0.50	0.025	0.0187	0.1390	0.0111	0.0116	0.0067	0.0034	0.0487
Pb	mg/L	0.20	0.001	0.00321	0.00242	0.00295	0.00137	0.00139	0.00074	< 0.00007
P	mg/L	-	-	0.1	0.2	0.02	0.01	< 0.01	0.01	< 0.01
Sb	mg/L	-	-	0.0278	0.026	0.0287	0.0313	0.0253	0.0245	0.0368
Se	mg/L	-	0.001	0.005	0.005	0.003	0.004	0.003	0.007	0.004
Sn	mg/L	-	-	0.0021	0.0022	0.0015	0.0036	0.0033	0.0021	0.0026
Sr	mg/L	-	-	0.516	0.565	0.548	0.573	0.533	0.526	0.456
Ti	mg/L	-	-	0.0305	0.0017	0.0009	0.0011	0.0008	0.0021	0.0004
Tl	mg/L	-	0.0008	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0001	< 0.0001
U	mg/L	-	-	0.00632	0.00669	0.00698	0.00659	0.00736	0.00726	0.0111
V	mg/L	-	-	0.00426	0.00095	0.00072	0.00071	0.001	0.00077	< 0.001
W	mg/L	-	-	0.00208	0.00292	0.00217	0.00253	0.00246	0.00200	0.00456
Y	mg/L	-	-	0.000977	0.000067	0.000037	0.000035	0.000185	0.000035	0.000022
Zn	mg/L	0.50	0.03	0.0272	0.0054	0.0101	0.011	0.0091	0.0038	0.0057

Table 9
Summary of CN1 CND 1-7 Solids (TWB) Tailings Supernatant Water Aging Results

Parameter	Units	MMER Guidelines (mg/L)	CCME	Day 0	Day 1	Day 3	Day 7	Day 15	Day 30	Day 44
Dissolved Metals										
Hg	mg/L	-	0.0001	0.0008	0.0009	0.0011	0.0014	0.0001	< 0.0001	< 0.0001
Ag	mg/L	-	0.0001	< 0.00003	0.00031	0.00064	0.00018	0.00005	< 0.00003	< 0.002
Al	mg/L	-	0.1	0.05	0.0485	0.0516	0.0368	0.0344	0.0407	0.0468
As	mg/L	0.50	0.005	0.334	0.343	0.318	0.32	0.293	0.269	0.283
B	mg/L	-	-	0.044	0.043	0.045	0.046	0.046	0.042	0.051
Ba	mg/L	-	-	0.037	0.0376	0.0373	0.0386	0.0356	0.0374	0.0328
Be	mg/L	-	-	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004
Bi	mg/L	-	-	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Ca	mg/L	-	-	159	160	153	151	156	152	136
Cd	mg/L	-	0.000017	0.00004	0.00005	< 0.00001	< 0.00001	0.00007	0.00004	< 0.00001
Co	mg/L	-	-	0.206	0.215	0.205	0.204	0.194	0.204	0.204
Cr	mg/L	-	0.001	0.001	0.001	< 0.004	0.0015	0.0015	0.0012	< 0.002
Cu	mg/L	0.30	0.004	***1.2***	***1.23***	***1.23***	***0.839***	0.191	0.0741	0.0512
Fe	mg/L	-	0.3	0.06	< 0.01	0.02	< 0.01	< 0.01	< 0.05	0.02
K	mg/L	-	-	28.3	22.5	24.6	24.0	21.4	24.1	27.8
Li	mg/L	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Mg	mg/L	-	-	7.90	7.86	7.51	7.77	8.18	9.07	9.75
Mn	mg/L	-	-	0.0826	0.0850	0.0799	0.0922	0.0965	0.0926	0.0770
Mo	mg/L	-	0.073	0.0498	0.0514	0.0554	0.0512	0.048	0.0526	0.0457
Na	mg/L	-	-	389	398	383	375	378	384	387
Ni	mg/L	0.50	0.025	0.0121	0.0123	0.0114	0.0158	0.0050	0.0053	0.0027
Pb	mg/L	0.20	0.001	< 0.00002	0.00087	0.00263	0.00098	0.00058	0.00026	< 0.00007
P	mg/L	-	-	0.03	0.02	0.02	0.02	0.01	< 0.01	0.02
Sb	mg/L	-	-	0.0271	0.0269	0.0288	0.0323	0.0240	0.0300	0.0369
Se	mg/L	-	0.001	0.003	0.003	0.004	0.004	0.004	0.002	0.002
Sn	mg/L	-	-	0.0015	0.0022	0.0016	0.0024	0.002	0.002	0.0013
Sr	mg/L	-	-	0.479	0.510	0.495	0.536	0.517	0.530	0.467
Ti	mg/L	-	-	0.0005	0.0004	0.0006	0.0005	0.0003	0.0002	0.0003
Tl	mg/L	-	0.0008	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
U	mg/L	-	-	0.00583	0.00575	0.00607	0.00587	0.00603	0.0073	0.00462
V	mg/L	-	-	0.00081	0.00087	0.0007	0.00123	0.00091	0.00103	0.001
W	mg/L	-	-	0.00195	0.00186	0.00197	0.00195	0.00193	0.00203	0.00164
Y	mg/L	-	-	0.000005	< 0.000005	0.000013	0.000017	0.000014	0.000014	0.000009
Zn	mg/L	0.50	0.03	0.003	0.0038	0.0098	0.0105	0.0052	0.0032	0.0015
Other Parameters										
Thiosalts	as S_2O_3 mg/L	-	-	171	-	-	-	-	-	-
S2O3	mg/L	-	-	-	1.4	2.3	0.9	0.2	< 2	1.2
S3O6	mg/L	-	-	-	6	2	< 2	< 2	< 2	< 2
S4O6	mg/L	-	-	-	1.8	2.3	4.8	6.1	8.0	8.9
CN(T)	mg/L	1.00	-	0.663	0.638	0.752	0.408	0.510	0.560	0.430
CN(F)	mg/L	-	0.005	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	<0.2
CNWAD	mg/L	-	-	0.588	0.494	0.793	0.313	0.044	0.160	0.170

Notes:

1.0	Indicates a value that is elevated relative to the CCME guideline.
1.0	Indicates a value that is elevated relative to the MMER and CCME (if present) guideline values.

CCME and MMER values provided only as basis of comparison, values above guidelines require further evaluation.

FIGURES

Figure 1a.
Summary of Major Element Distribution (ICP) for Argillite Samples
Touquoy Site
Halifax

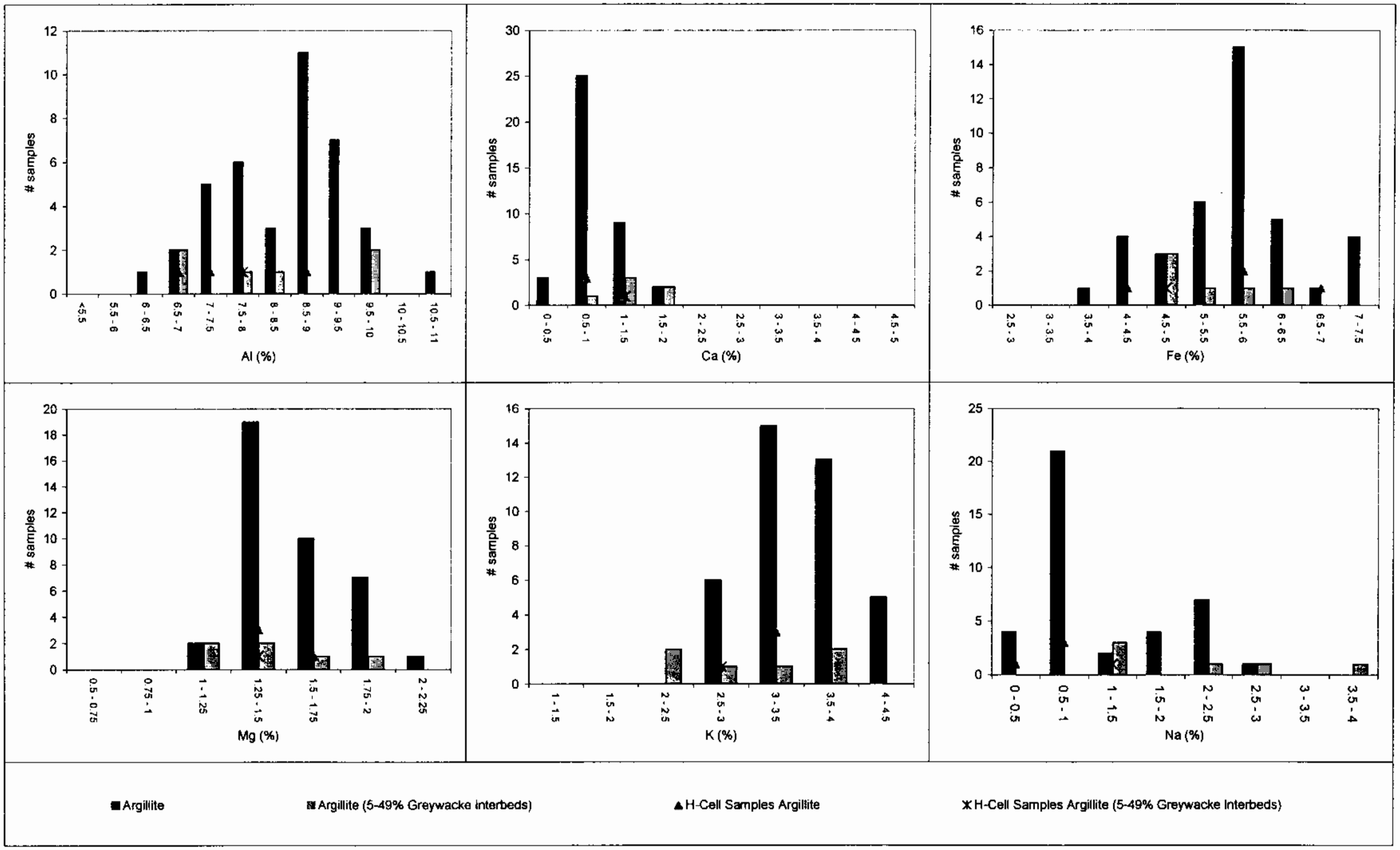

Figure 1b.
Summary of Major Element Distribution (ICP) for Greywacke Samples
Touquoy Site
Halifax

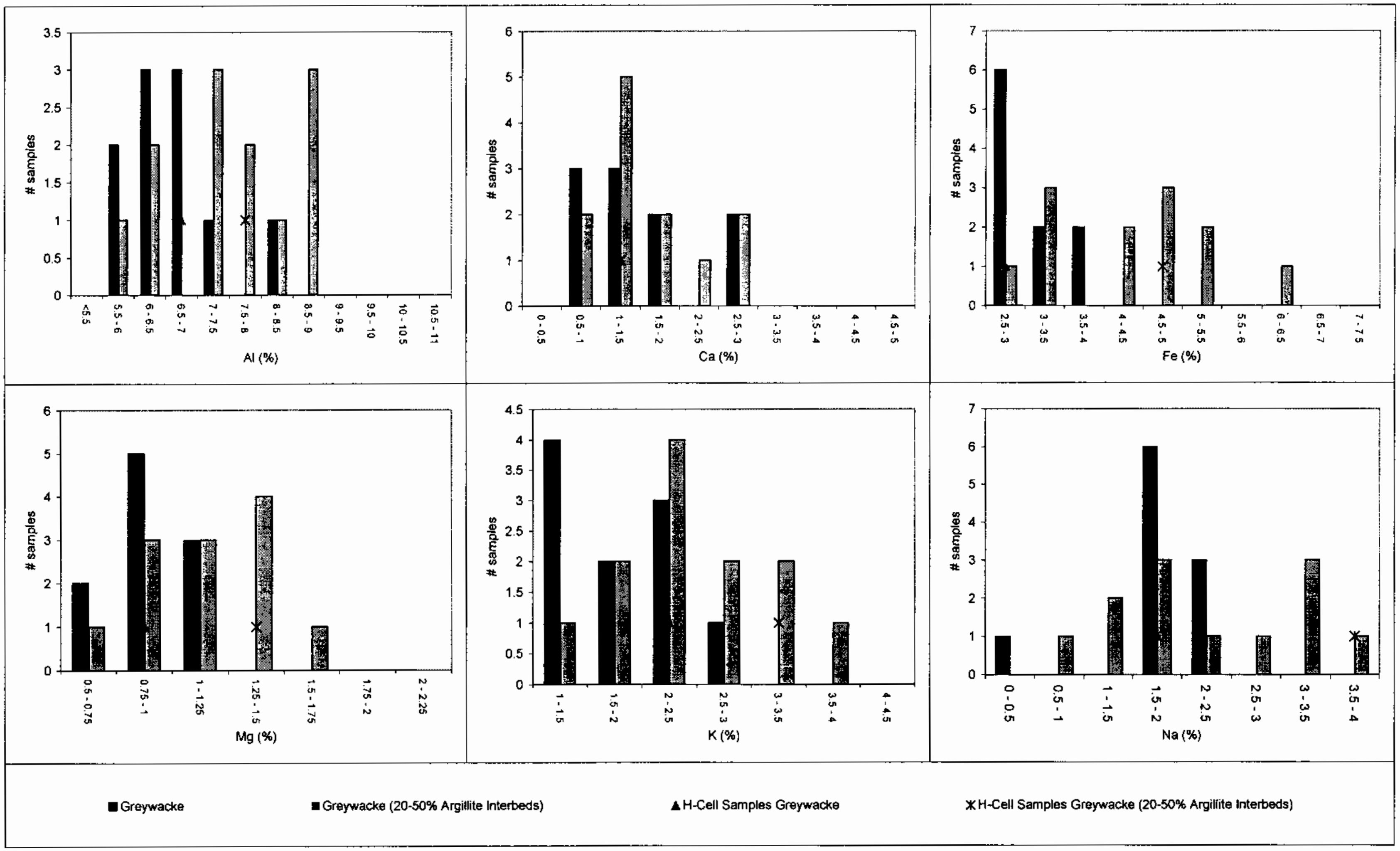

Figure 1c.
Summary of Major Element Distribution (ICP) for Composite and Marginal Ore Samples
Touquoy Site
Halifax

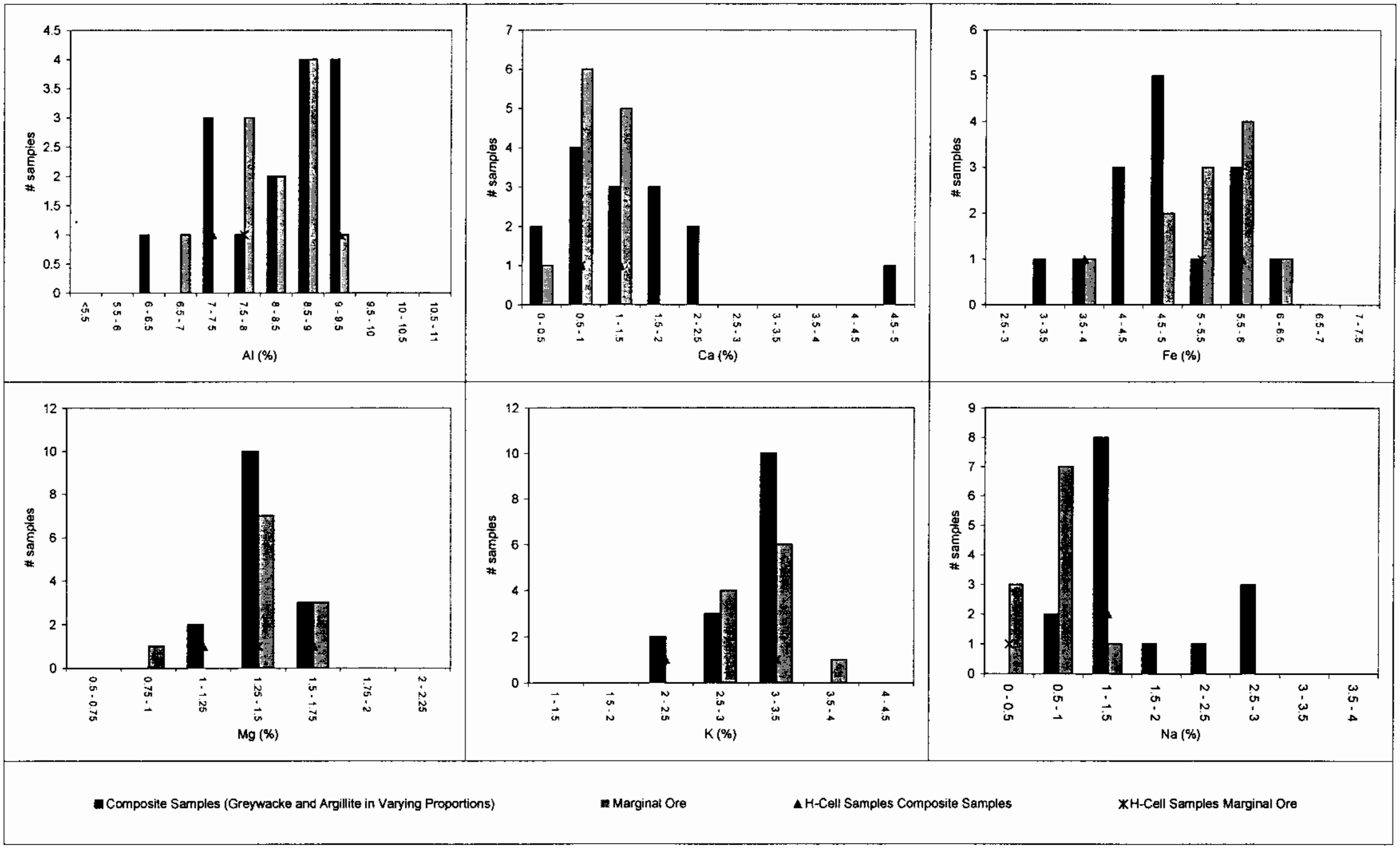

Figure 2a.
Summary of Sulphide and ICP Trace Metal Distributions for Argillite Samples
Touquoy Site
Halifax

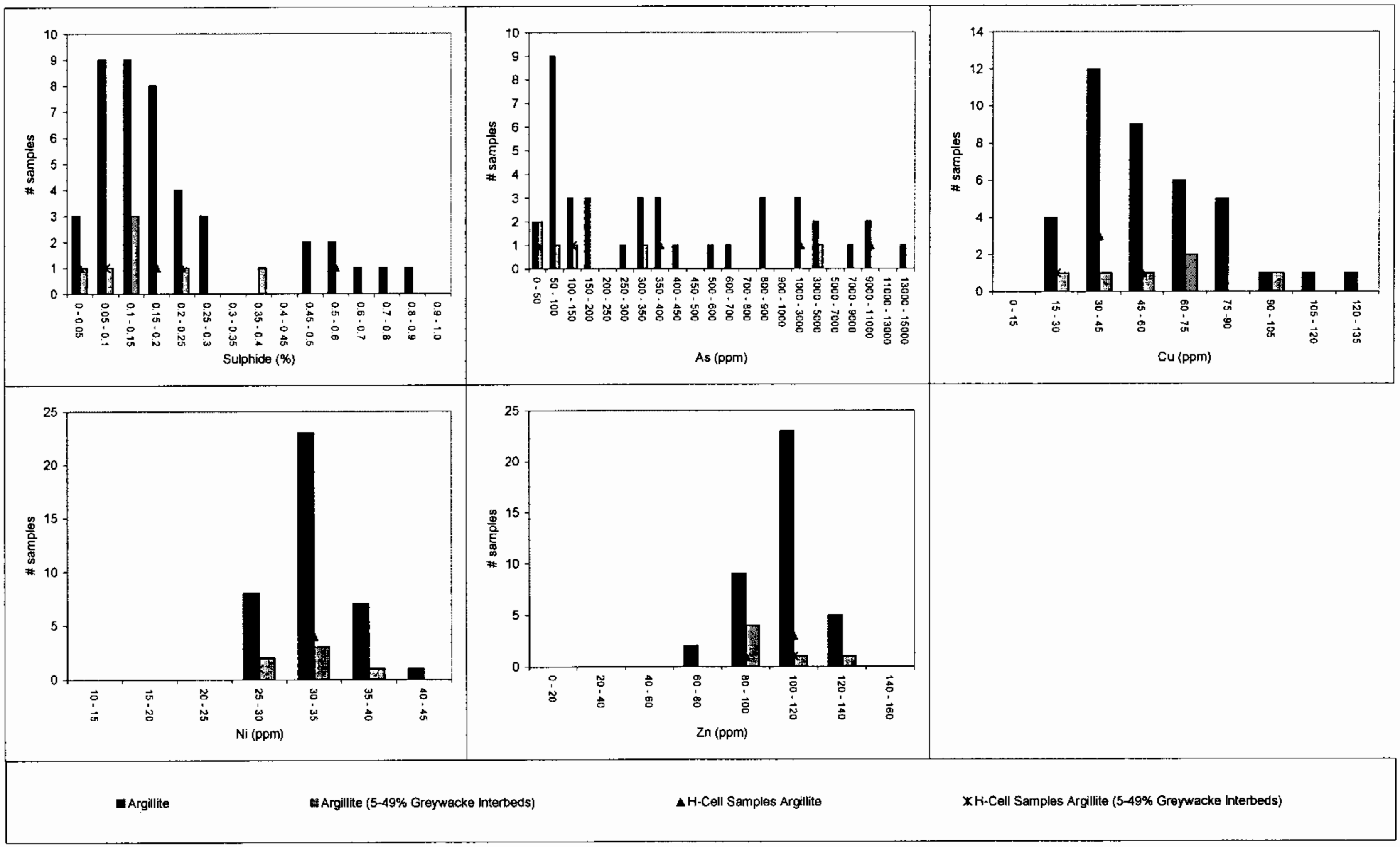

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Figure 2b.
Summary of Sulphide and Trace Metal Distributions for Greywacke Samples
Touquoy Site
Halifax

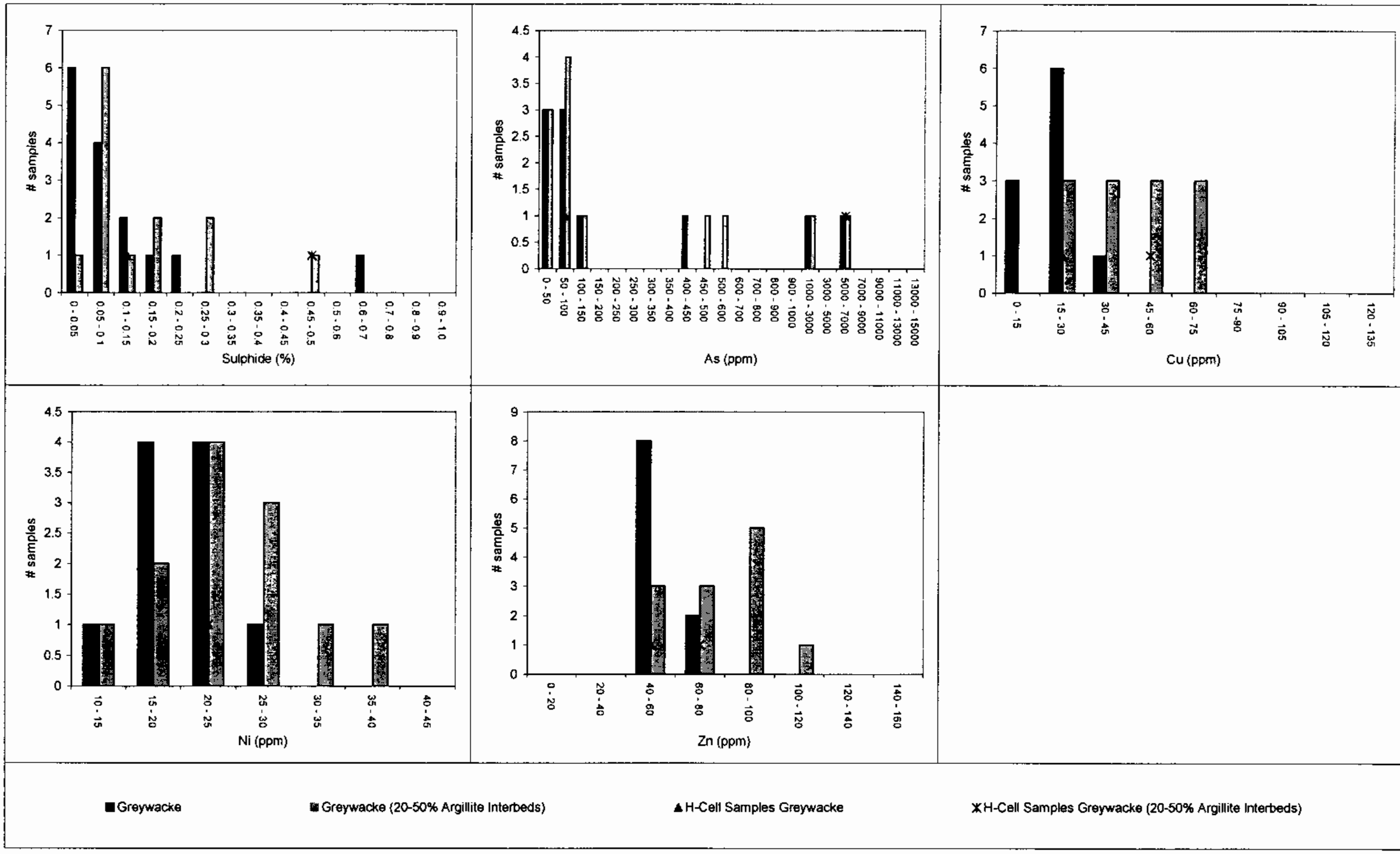

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Figure 2c.
Summary of Sulphide and ICP Trace Metal Distributions for Composite and Marginal Ore Samples
Touquoy Site
Halifax

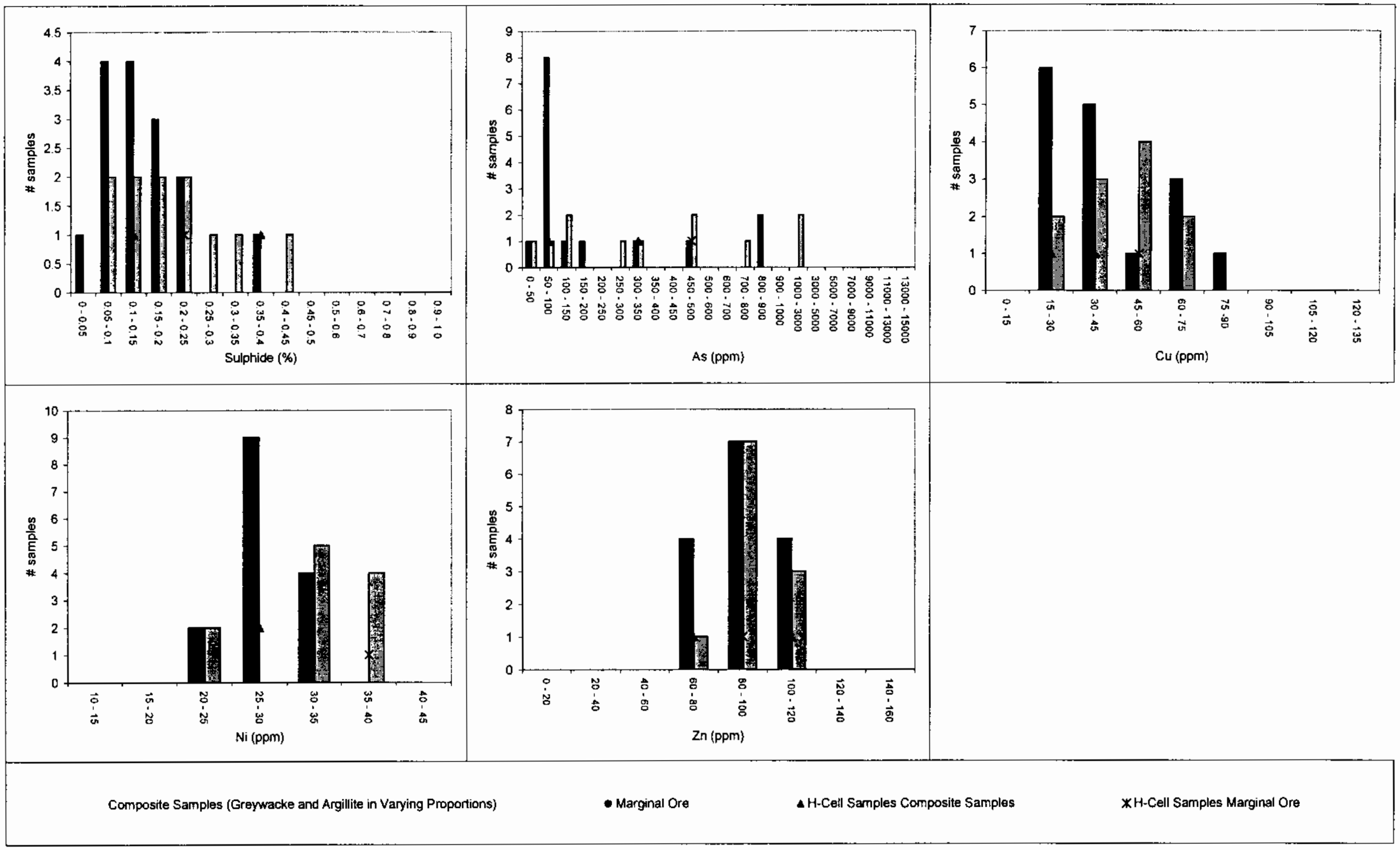

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Figure 3.
Sulphide Sulphur vs. Total Sulphur by Lithology

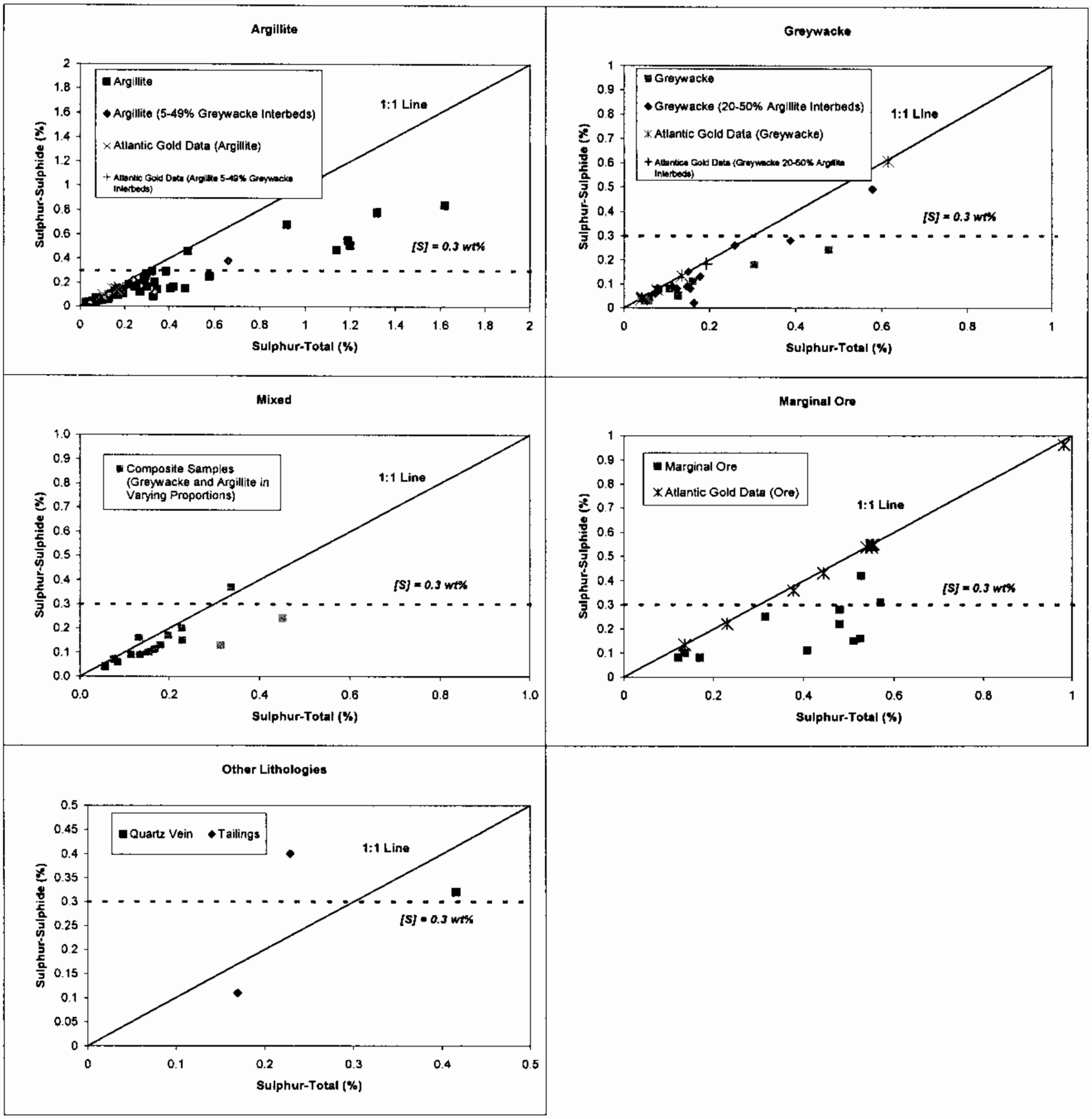

Figure 4.
Bulk Neutralization Potential vs. Carbonate Neutralization Potential

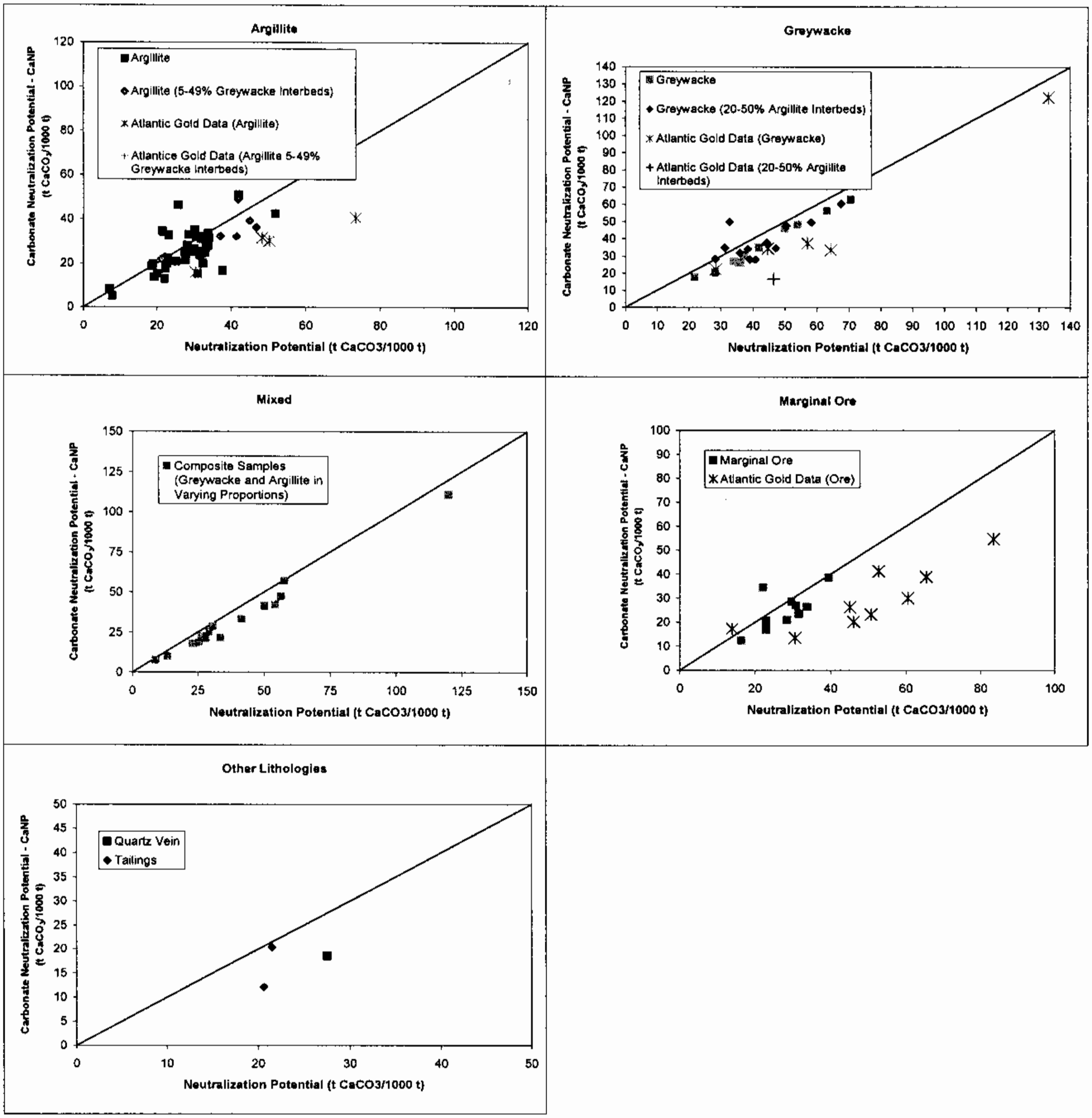

Figure 5.
Potential for Acid Rock Drainage (Acid Potential vs. Carbonate Neutralization Potential) by Lithology

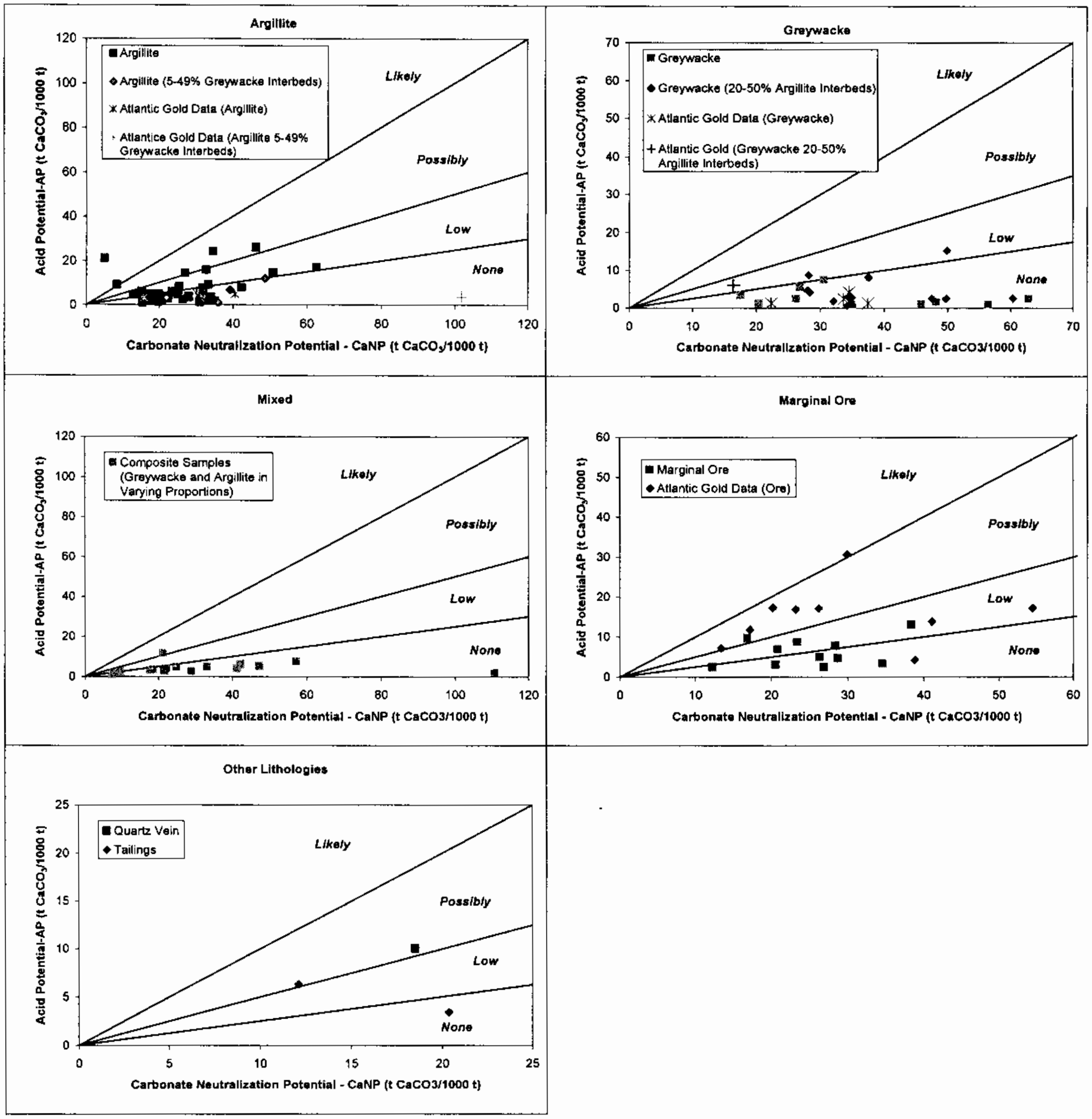

Figure 6.
Potential for Acid Rock Drainage (Acid Potential vs. Bulk Neutralization Potential) by Lithology

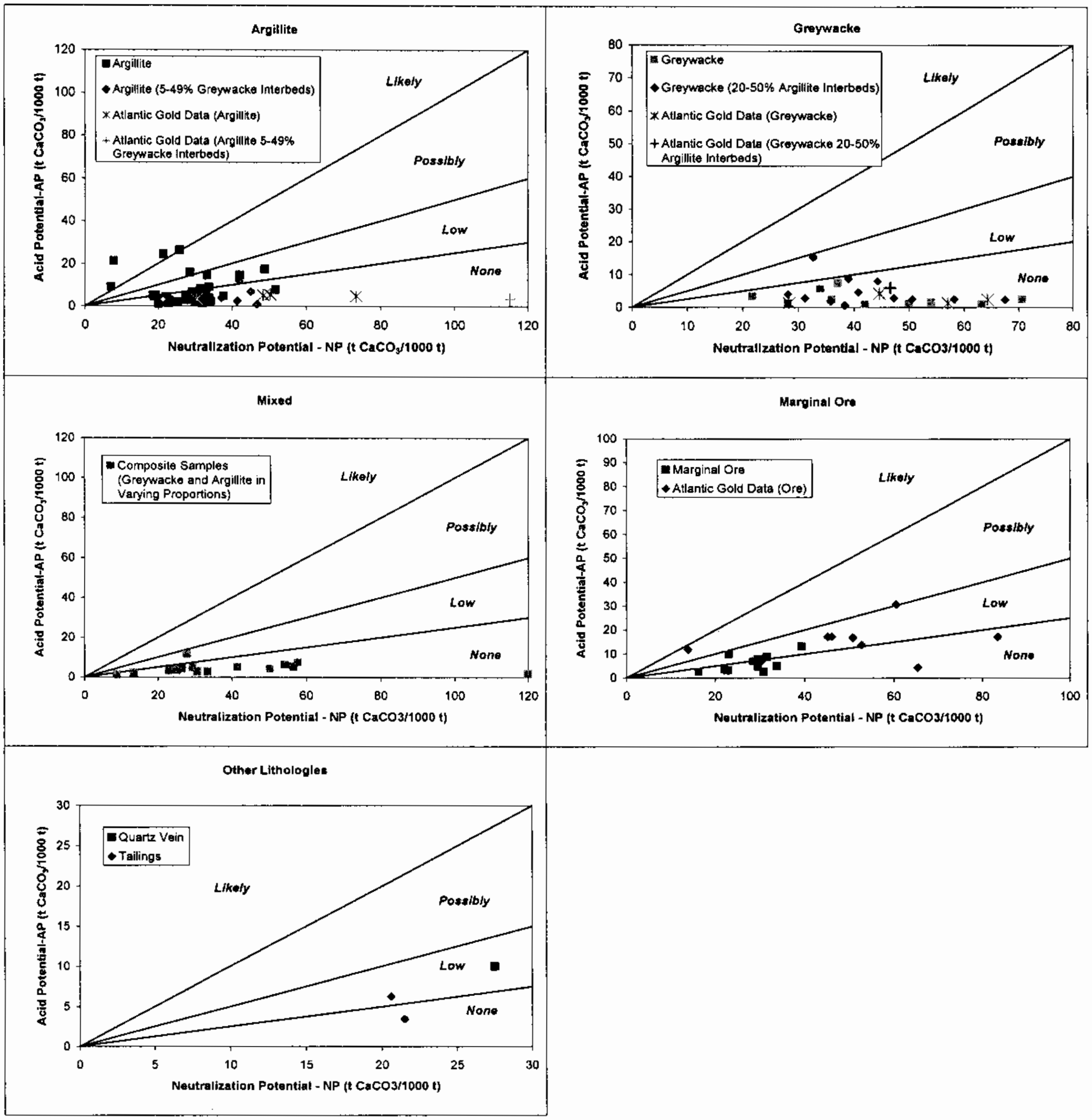

Figure 7a.
Summary of Short Term Leach Results for Argillite Samples
Touquoy Site
Halifax

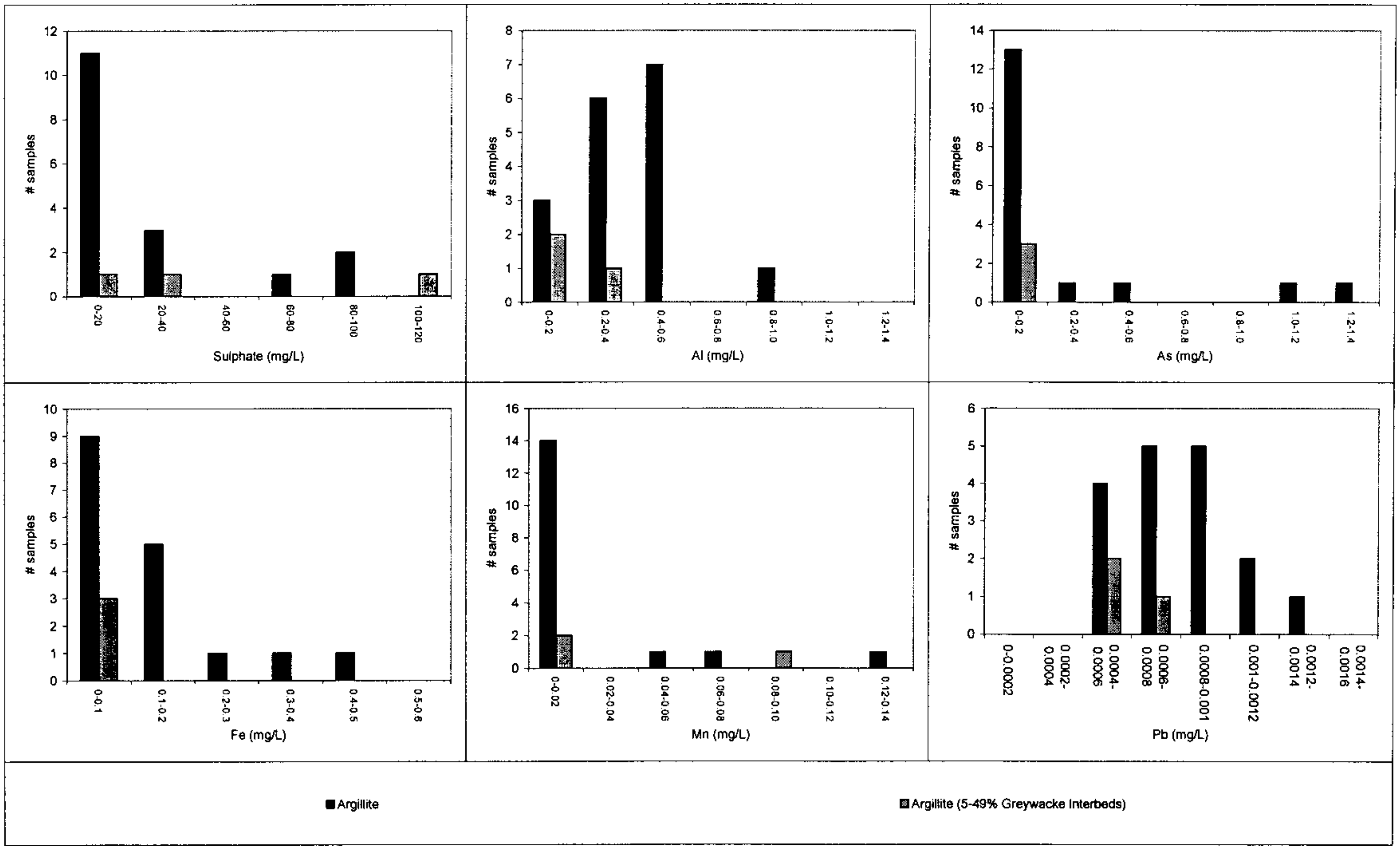

Figure 7b.
Summary of Short Term Leach Results for Greywacke Samples
Touquoy Site
Halifax

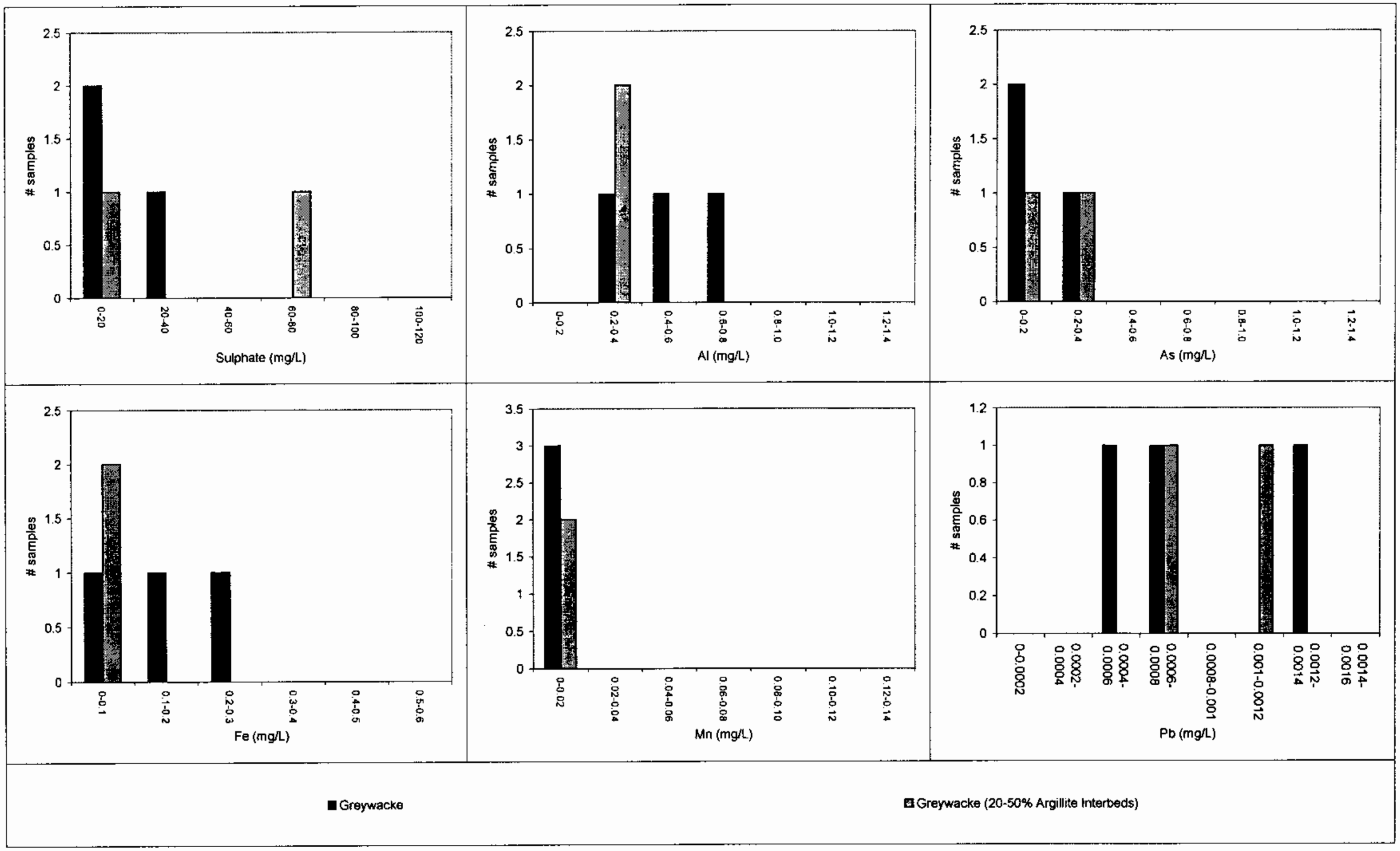

Figure 7c.
Summary of Short Term Leach Results for Composite and Marginal Ore Samples
Touquoy Site
Halifax

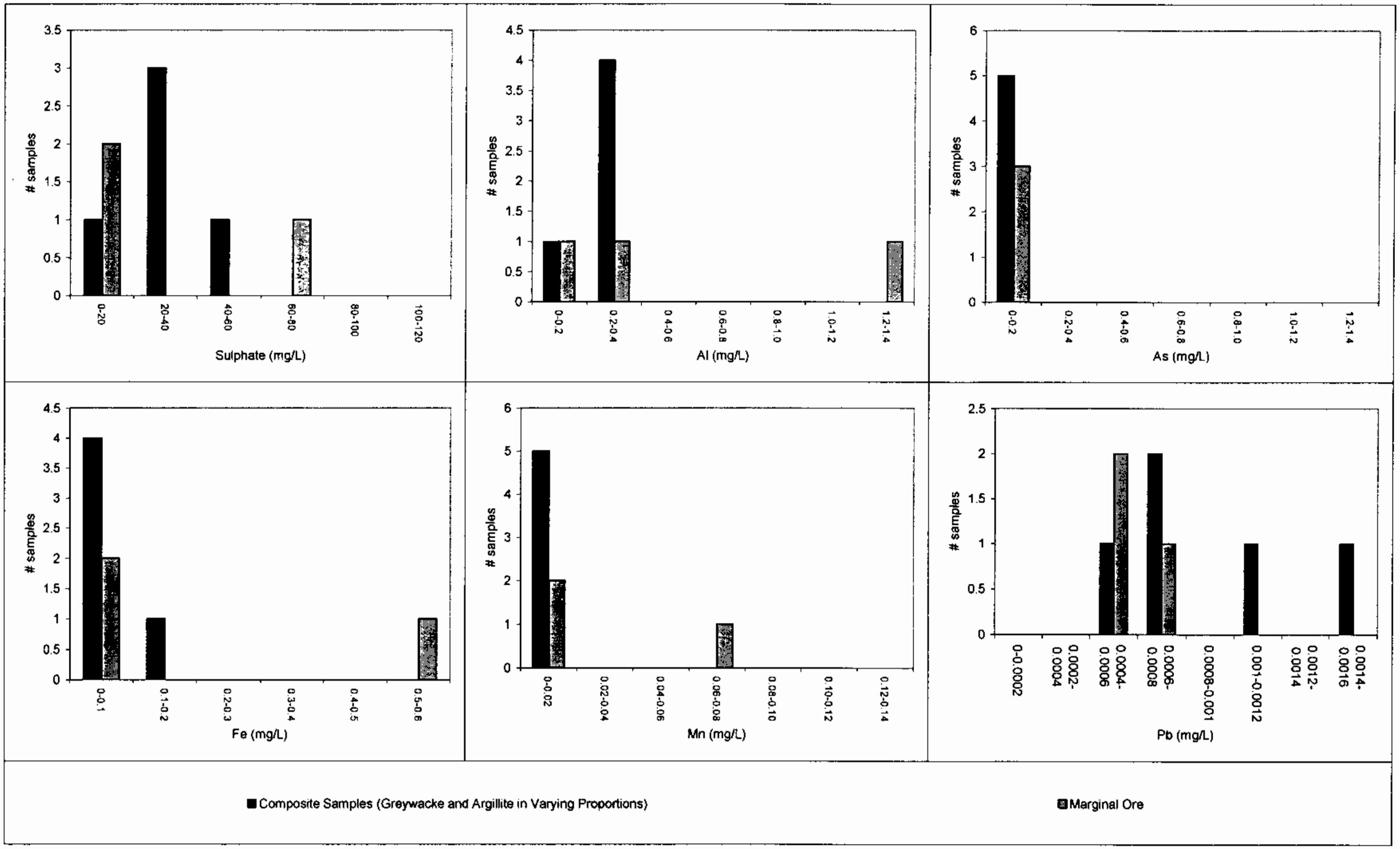

FIGURE 8a
HUMIDITY CELL RESULTS FOR HC 06-006
Argillite (<5% Greywacke)

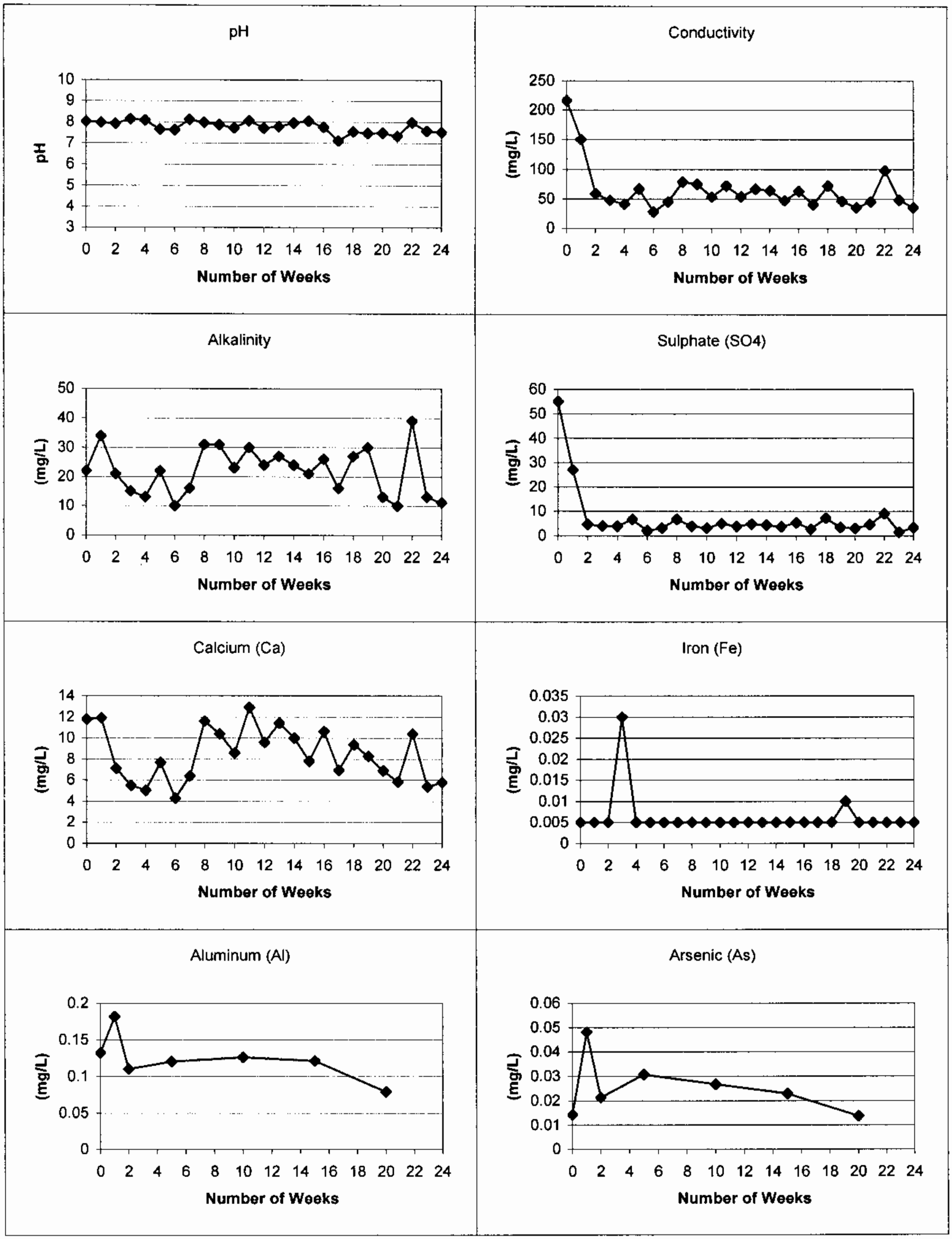

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FIGURE 8a
HUMIDITY CELL RESULTS FOR HC 06-006
Argillite (<5% Greywacke)

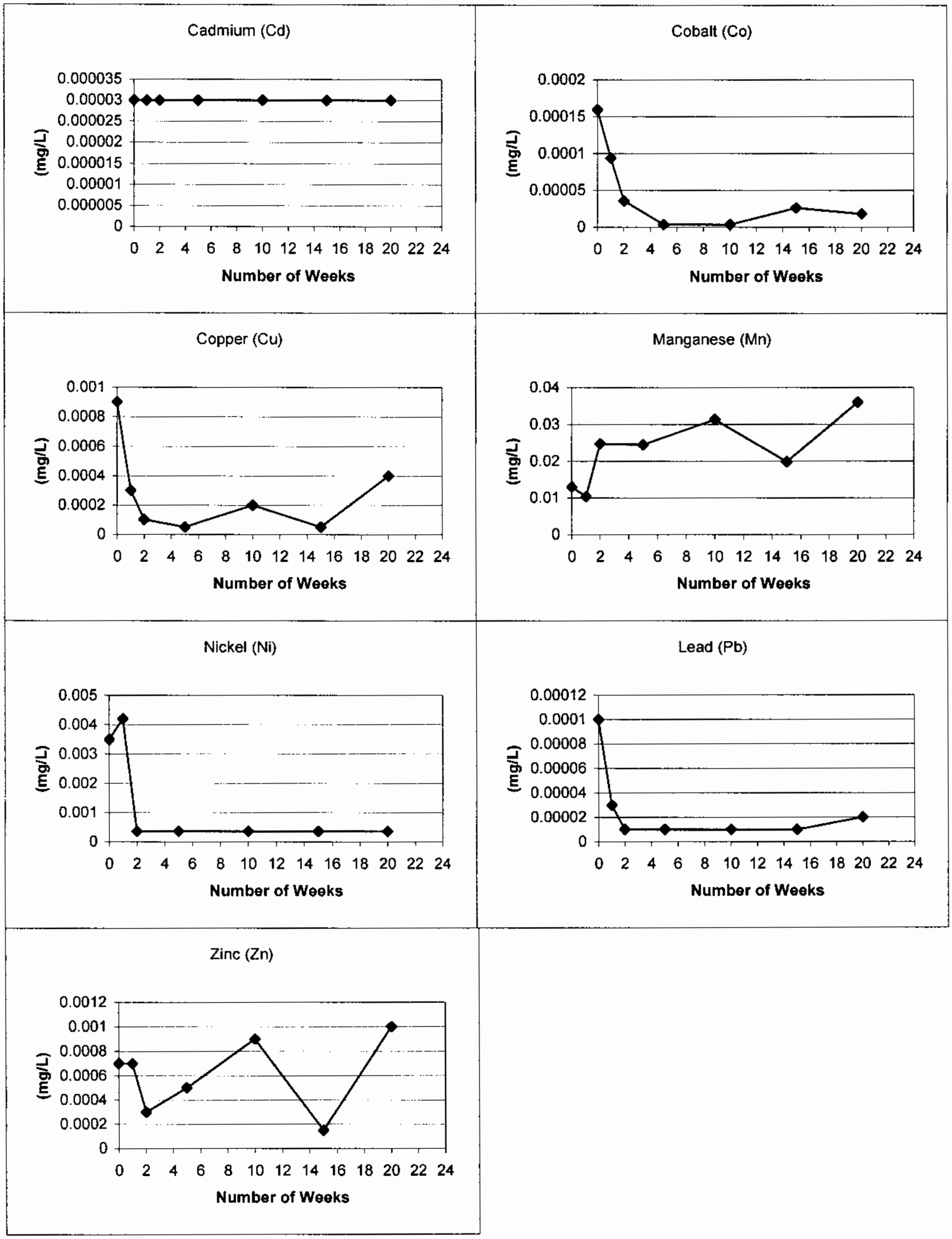

FIGURE 8b
HUMIDITY CELL RESULTS FOR HC 06-017
Argillite (<5% Greywacke)

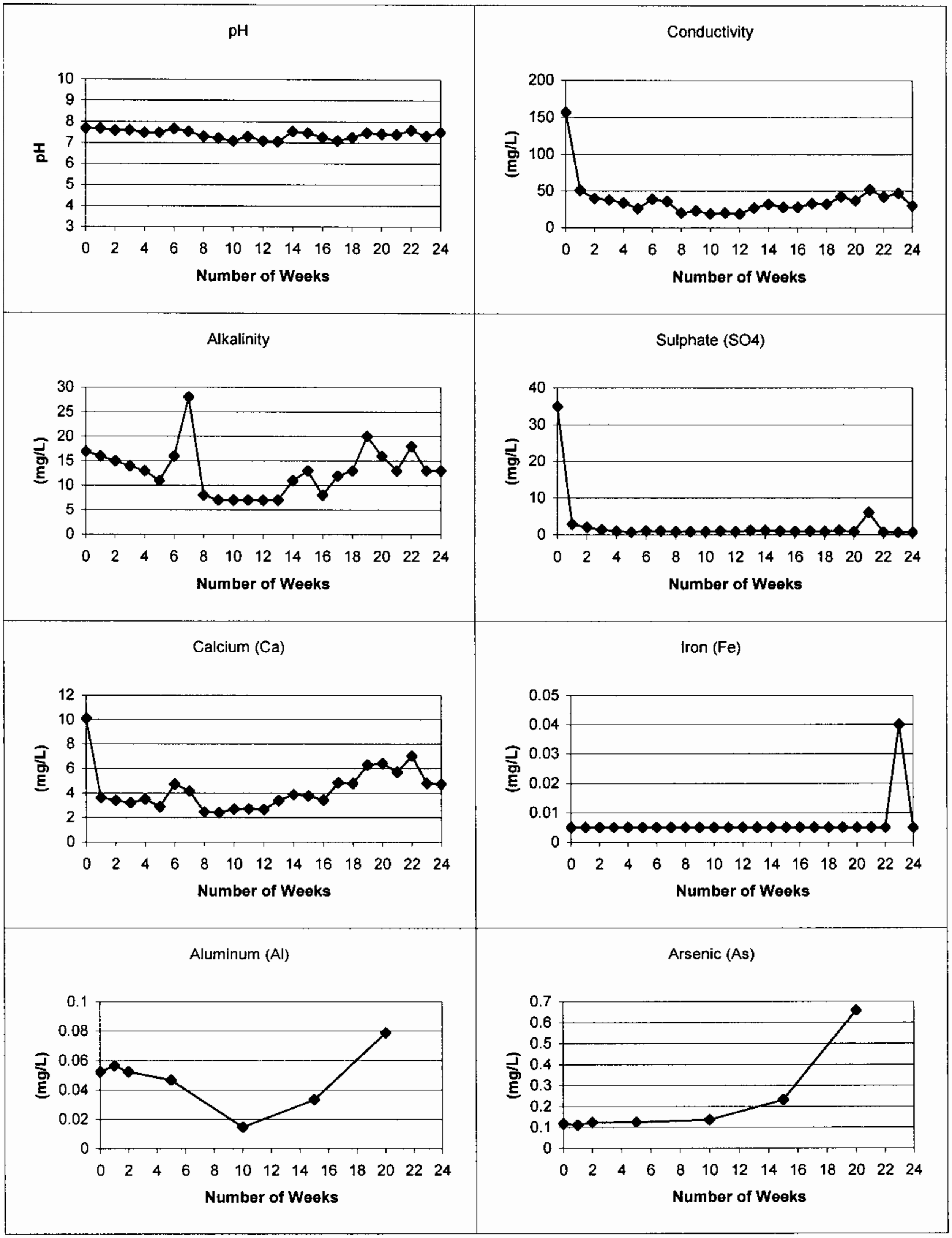

FIGURE 8b
HUMIDITY CELL RESULTS FOR HC 06-017
Argillite (<5% Greywacke)

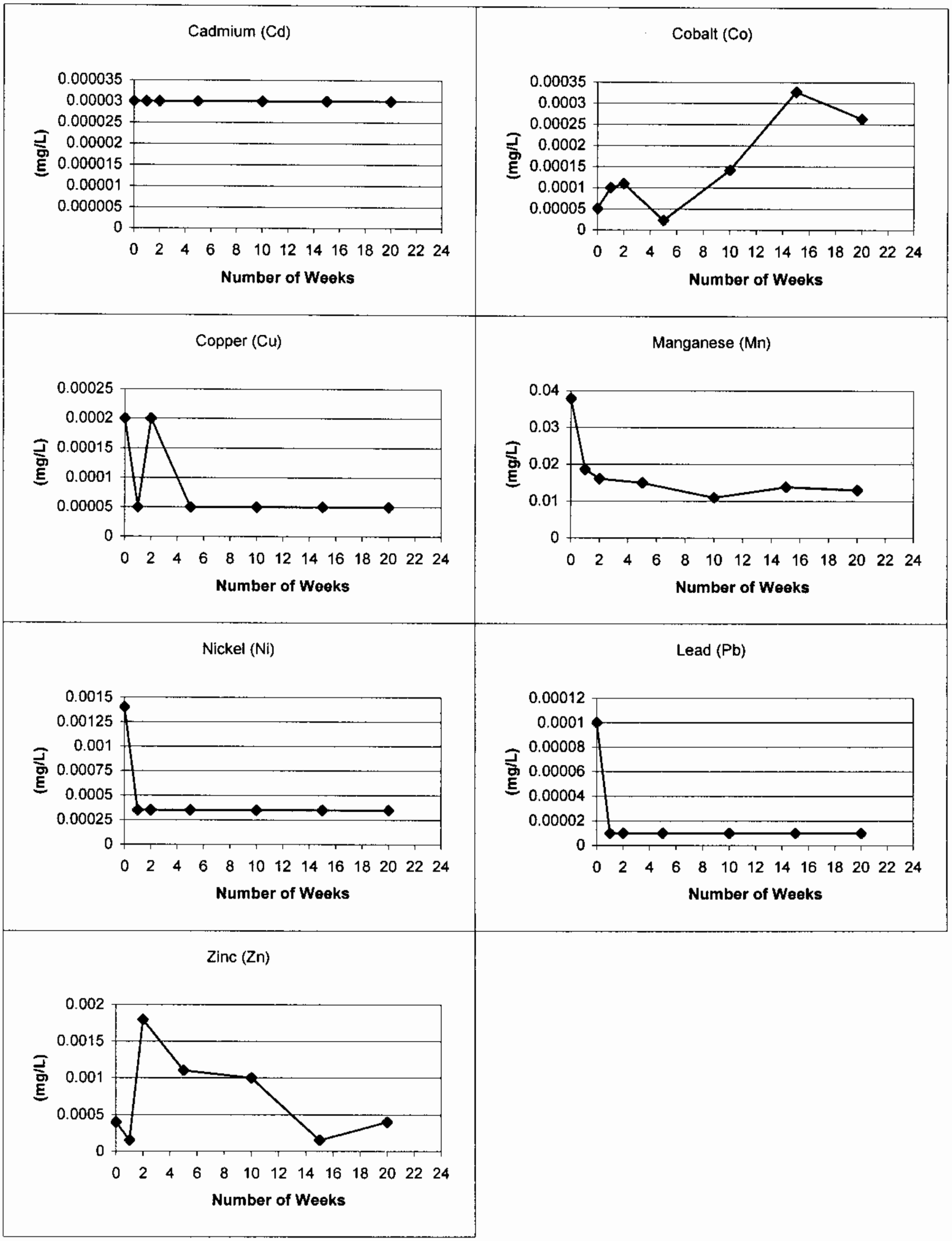

FIGURE 8c
HUMIDITY CELL RESULTS FOR HC 06-049
Argillite (<5% Greywacke)

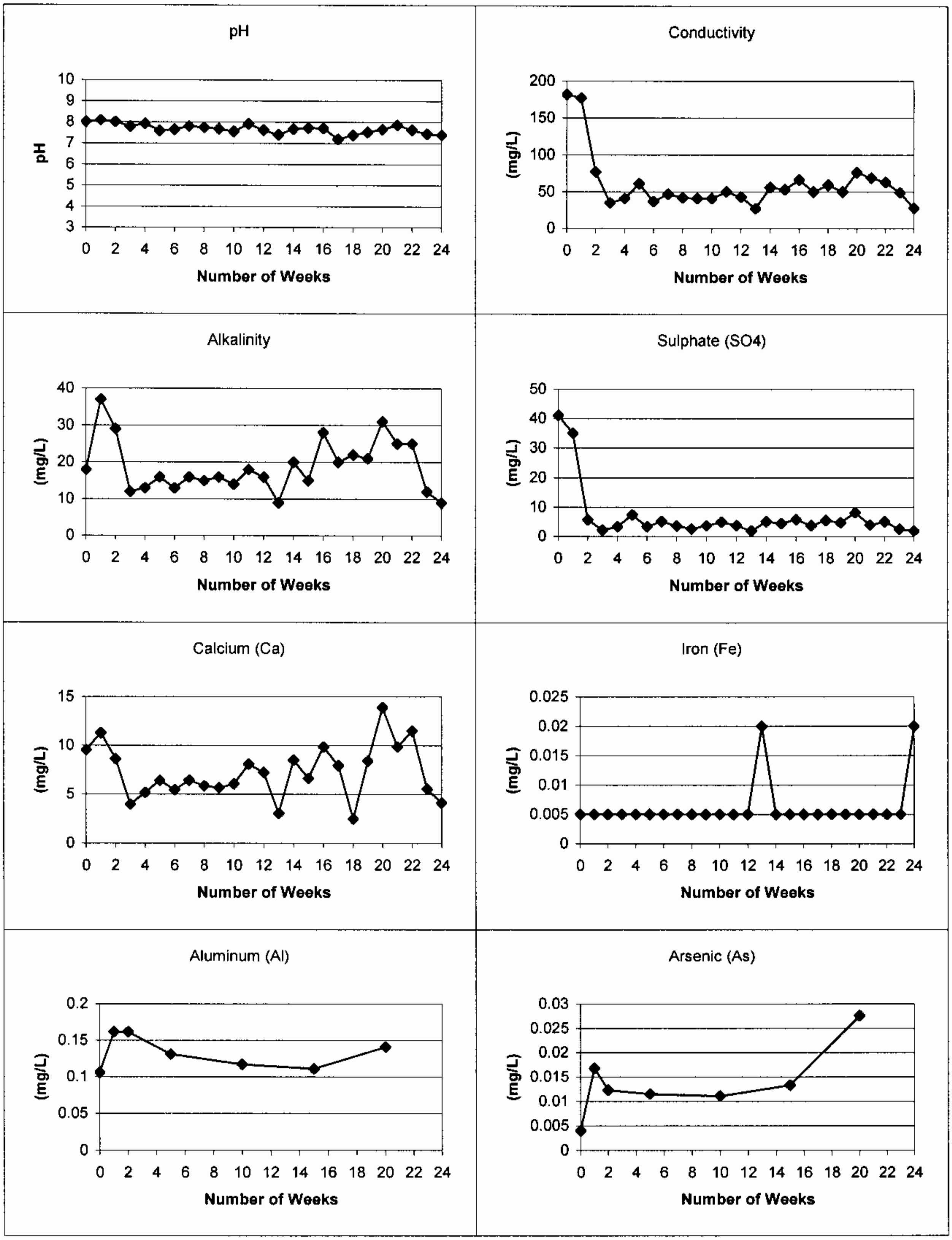

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FIGURE 8c
HUMIDITY CELL RESULTS FOR HC 06-049
Argillite (<5% Greywacke)

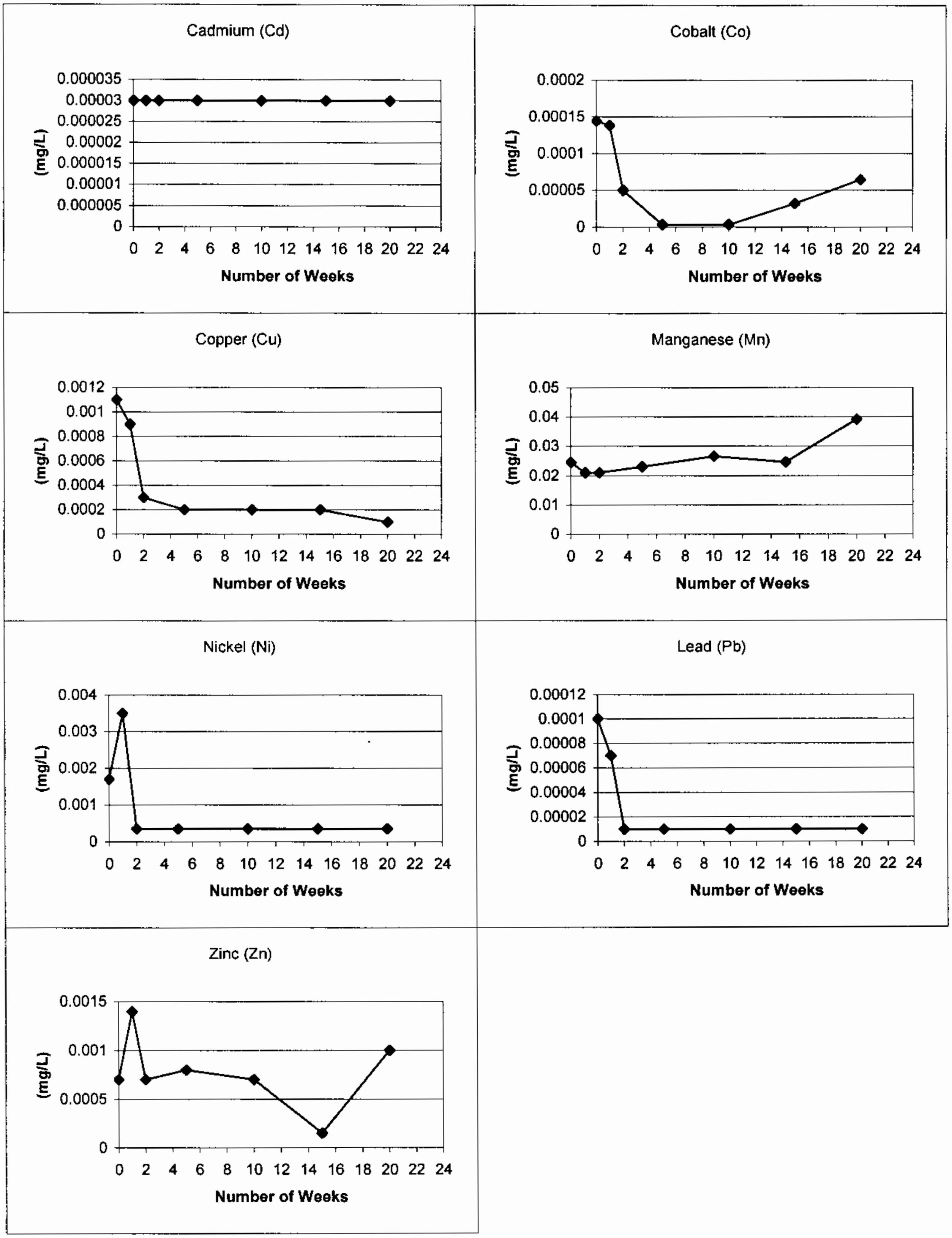

FIGURE 8d
HUMIDITY CELL RESULTS FOR HC 06-079
Argillite (<5% Greywacke)

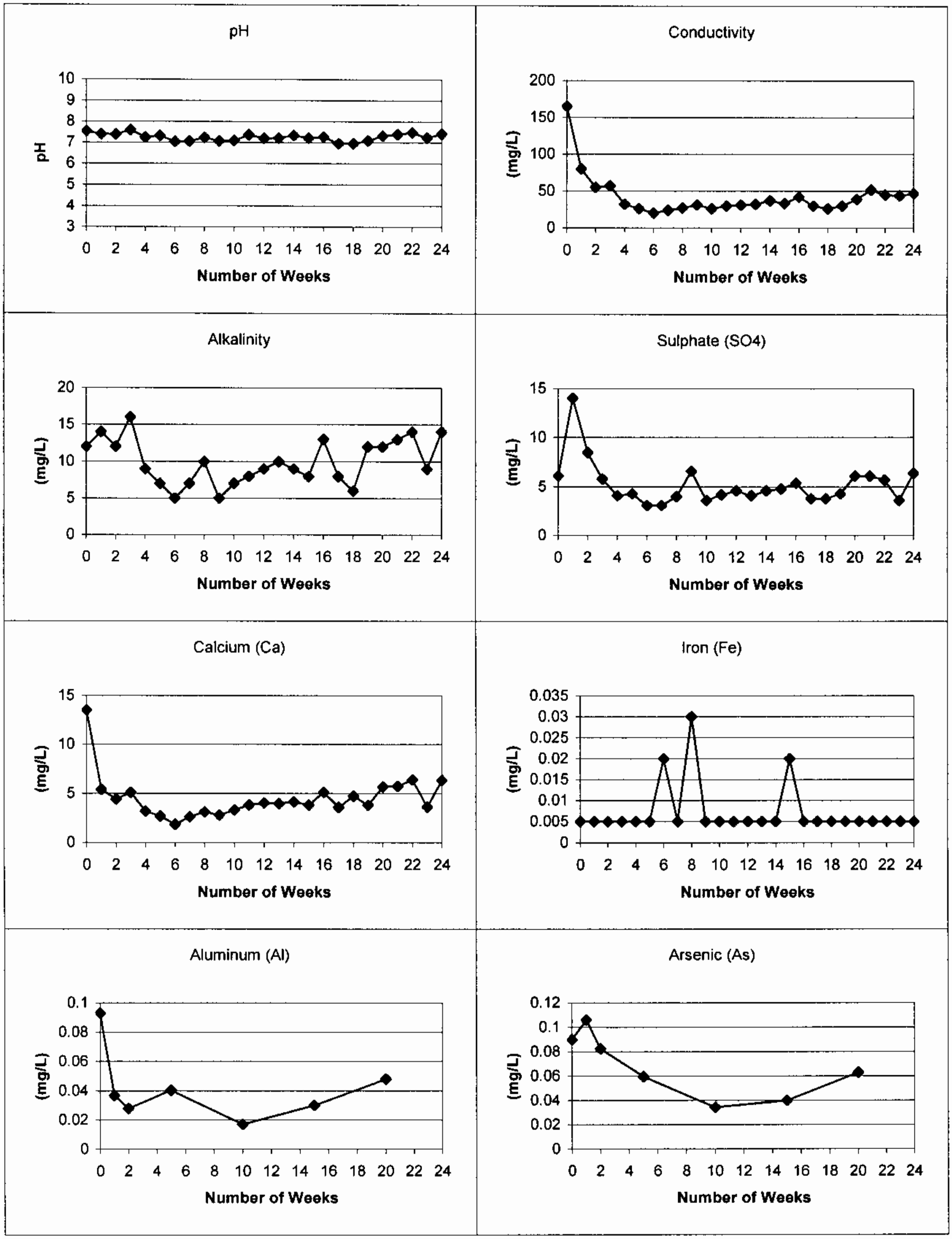

FIGURE 8d
HUMIDITY CELL RESULTS FOR HC 06-079
Argillite (<5% Greywacke)

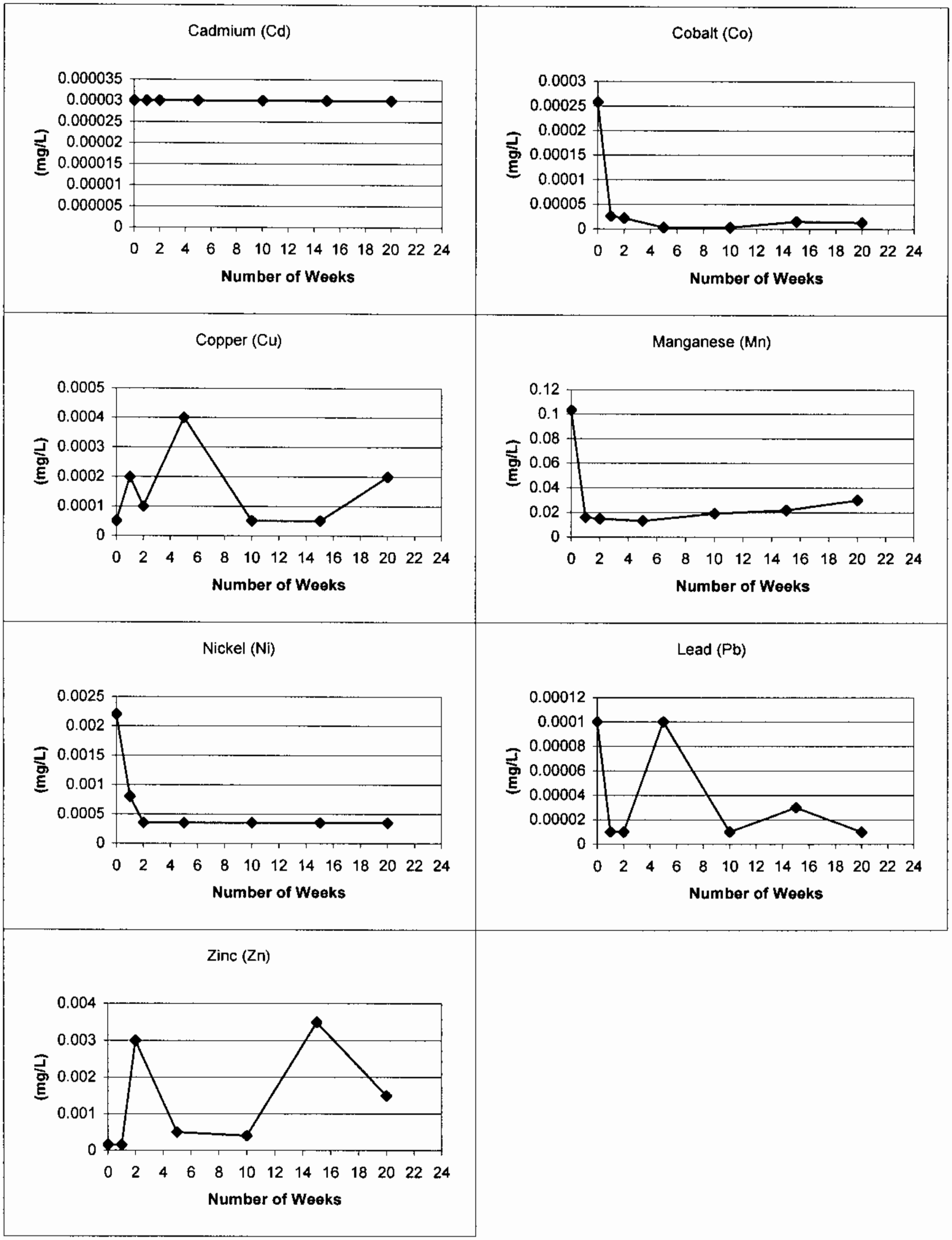

FIGURE 9
HUMIDITY CELL RESULTS FOR HC 06-068
Greywacke (<20% Argillite Interbeds)

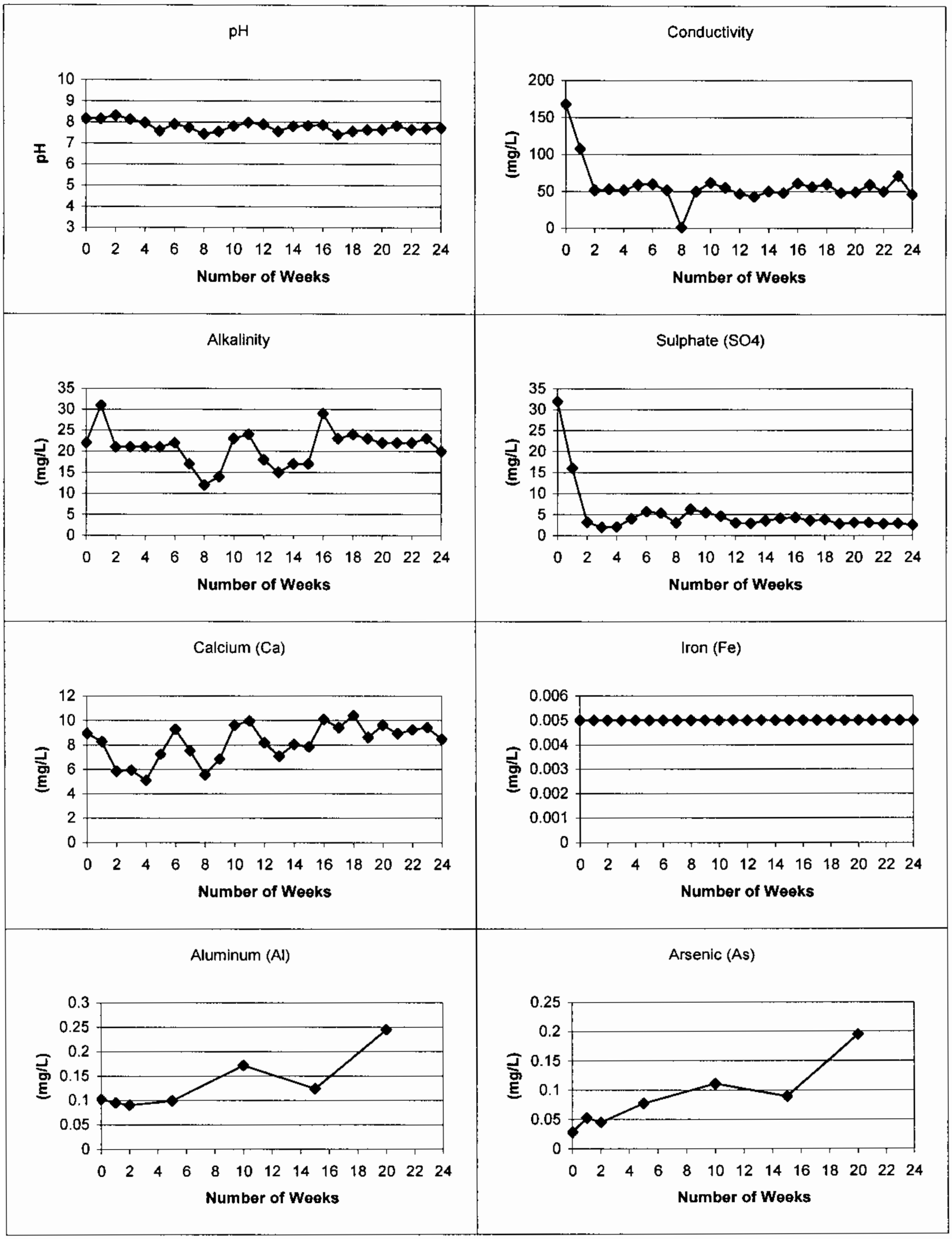

FIGURE 9
HUMIDITY CELL RESULTS FOR HC 06-068
Greywacke (<20% Argillite Interbeds)

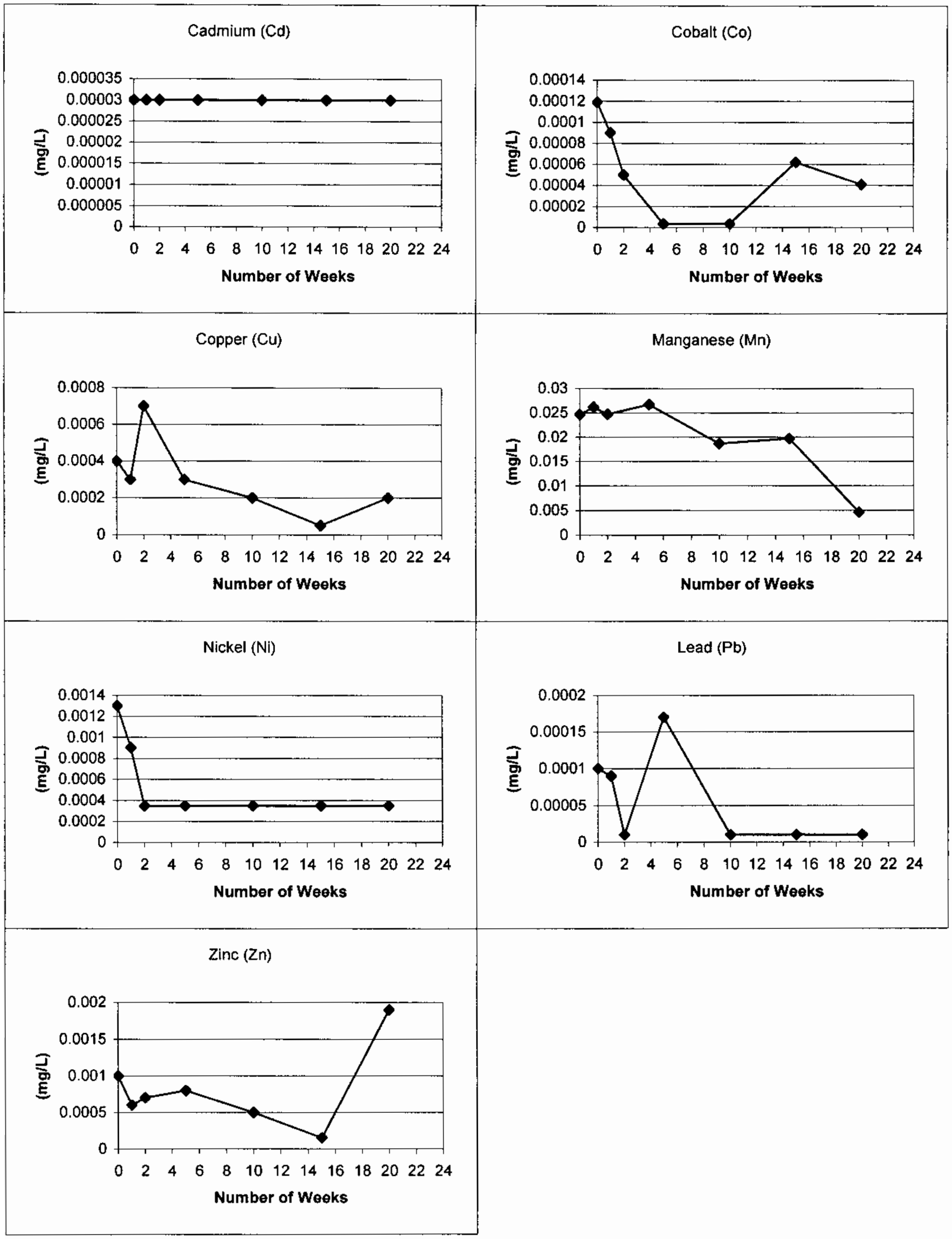

FIGURE 10
HUMIDITY CELL RESULTS FOR HC 06-012
Argillite (5-49% Greywacke Interbeds)

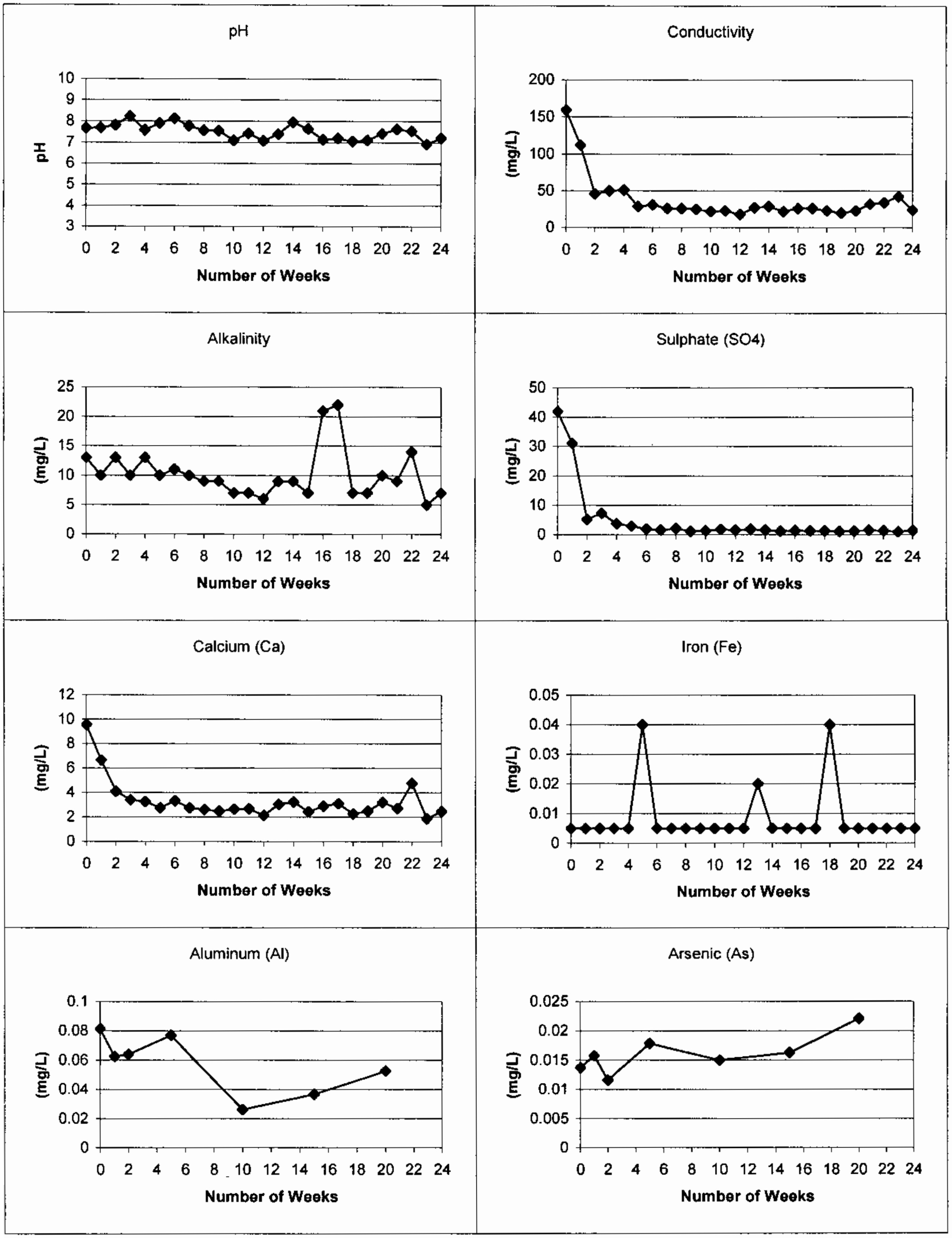

FIGURE 10
HUMIDITY CELL RESULTS FOR HC 06-012
Argillite (5-49% Greywacke Interbeds)

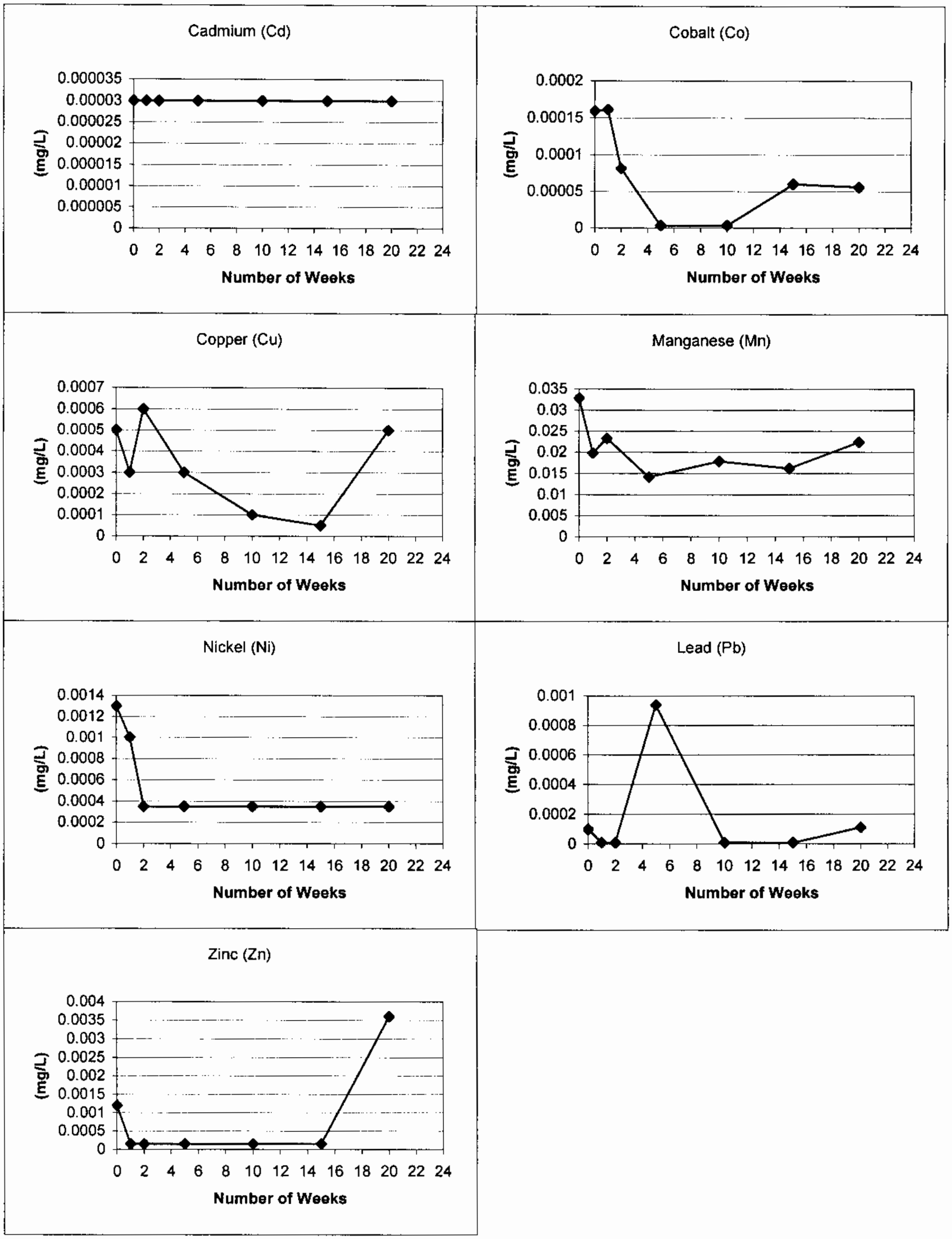

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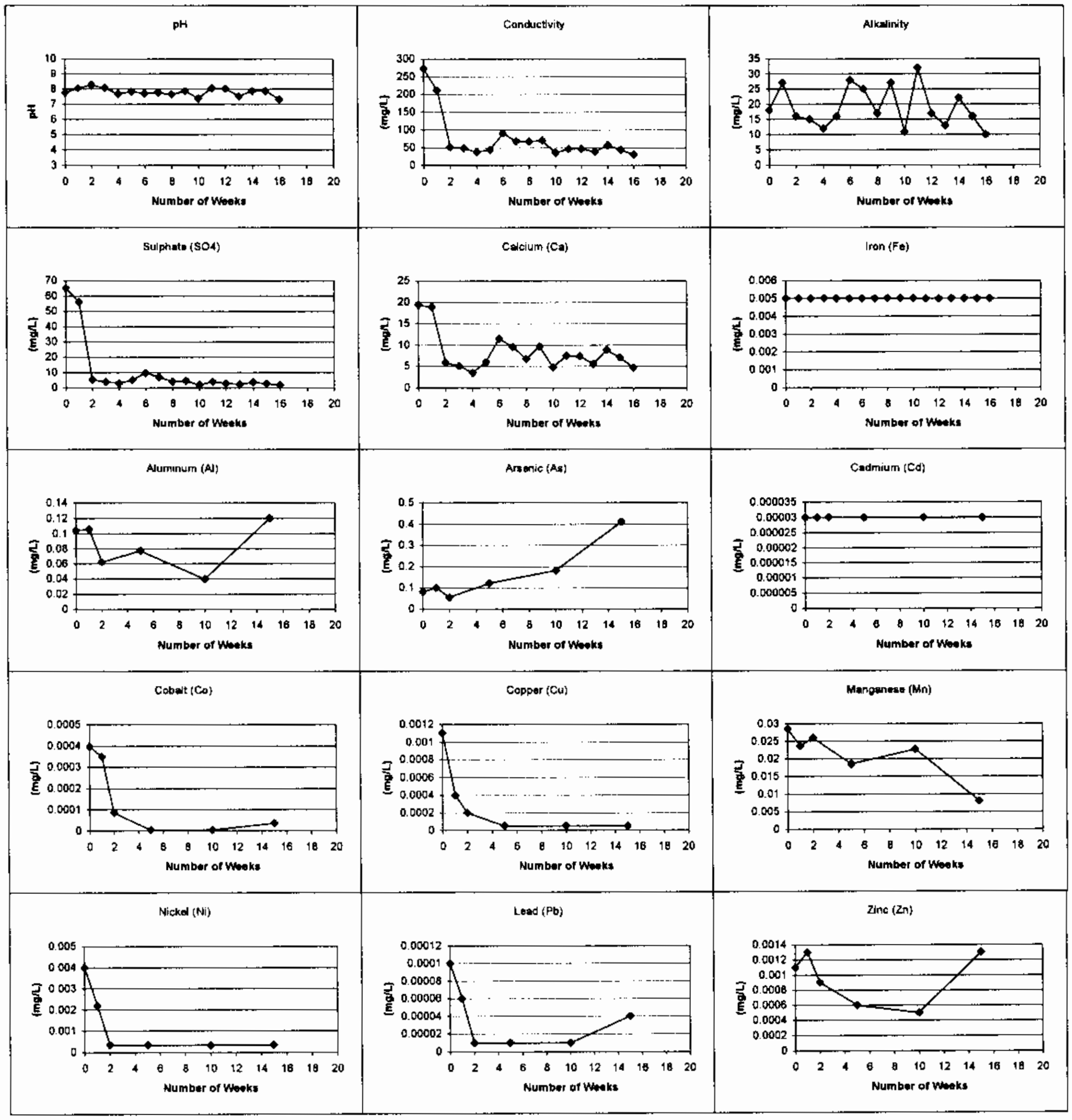
FIGURE 11
HUMIDITY CELL RESULTS FOR HC 06-039
Greywacke (20 - 50% Argillite interbeds)



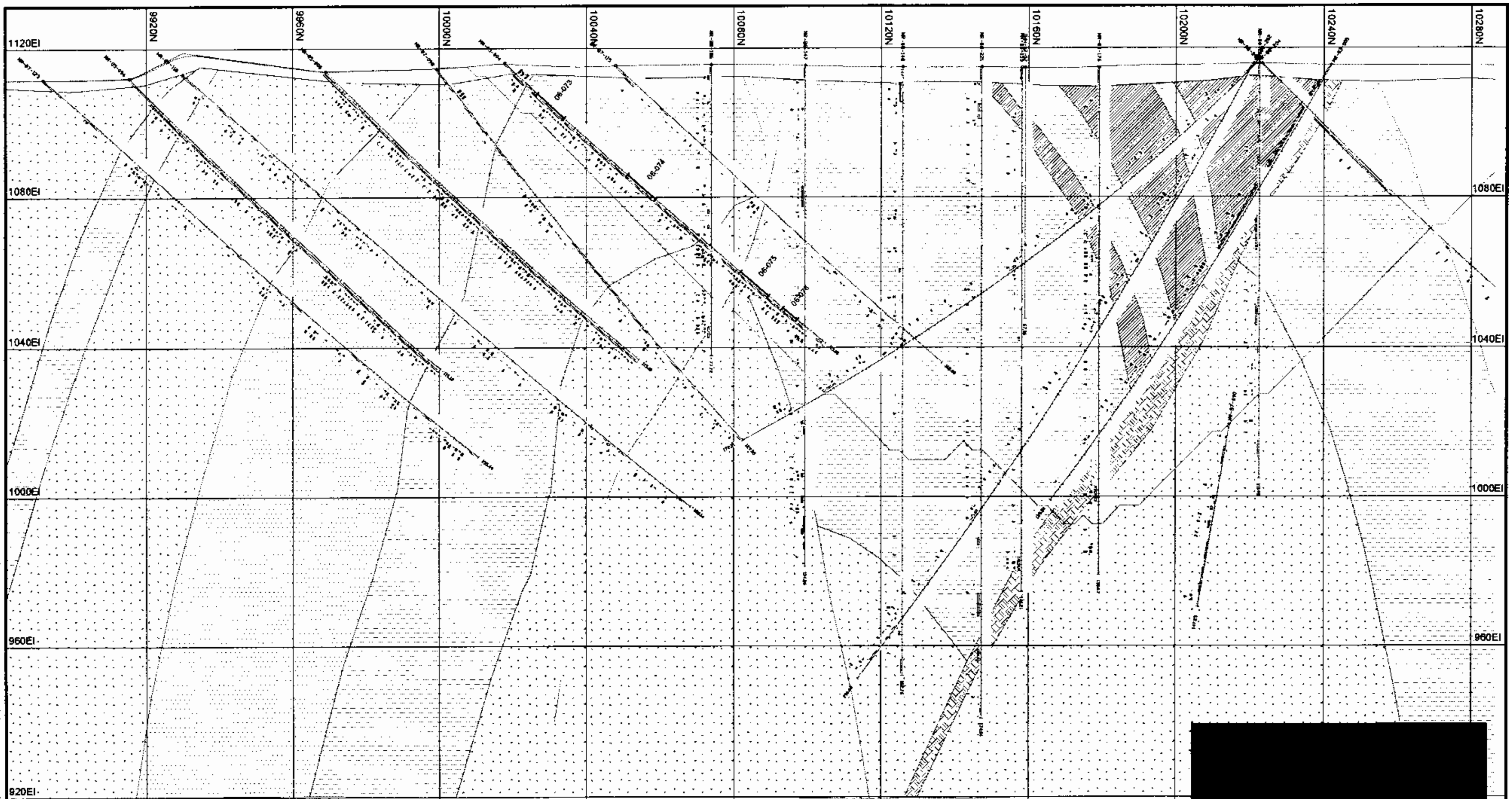
Appendix B-9
Summary of Depletion Calculations from Humidity Cell Data

Sample	Depletion Rate (mg/kg/wk)			Time to Depletion (years)		
	Sulphide	NP	CaNP	Sulphide	NP	CaNP
CND2	6.1	27.9	20.7	2.9	14.3	18.4
HC 06-006	1.2	17.6	14.8	27.7	35.4	31.4
HC 06-012	0.4	8.0	6.4	39.9	99.1	95.3
HC 06-017	0.6	14.8	13.8	9.8	25.7	21.1
HC 06-039	0.9	22.6	21.7	102.3	27.3	43.8
HC 06-049	1.3	20.9	19.6	32.5	26.3	24.3
HC 06-051	2.3	24.0	23.1	11.5	23.0	20.2
HC 06-068	0.9	22.8	21.8	15.8	29.9	22.6
HC 06-070	0.9	8.0	7.5	76.7	66.5	53.6
HC 06-079	1.8	16.4	13.2	54.8	33.1	47.1
HC 06-085	2.6	12.4	11.5	15.8	43.5	34.3

Note: These values are for indicational purposes as they reflect laboratory conditions which differ greatly from field conditions.

APPENDIX C

SAMPLE DISTRIBUTION ON GEOLOGICAL SECTIONS



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Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	109	Resource definition diamond drill holes	Westminer
DNR-95-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-036	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-129	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE	LINE DEFINITIONS	DRILL HOLE LEGEND	STRUCTURE	INTERPRETED GEOLOGY	DRILL TRACE LITHOLOGY
SAMPLE INTERVAL — 06-073 — SAMPLE No.	Pit Outlines	MINOR LITHOLOGY	Shear	Major Shear Interbedded Argillite & Greywacke Greywacke - fine grain Greywacke - medium grain Argillite	VOID Quartz Veining (>50%) Rip-up marker Unit Greywacke Greywacke with lesser Argillite Argillite with lesser Grewacke Argillite Overburden

20 0 20 40
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TITLE

TOUQUOY DEPOSIT
SECTION 21625 EAST

ATLANTIC GOLD N.L.

FIGURE C-1

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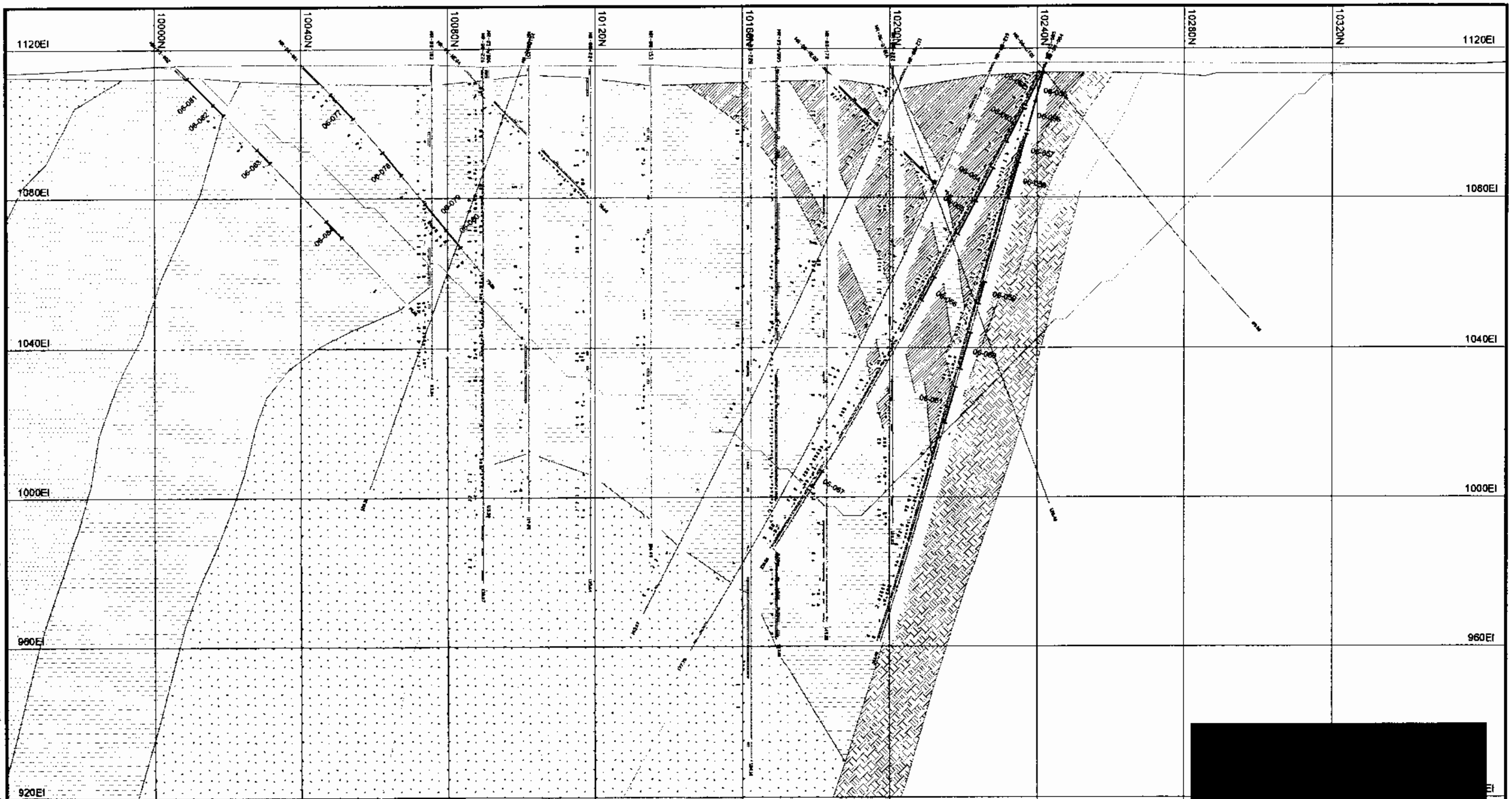

Hole IDs	No. of holes	Hole Types	Exploration Company
MR-88-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	109	Resource definition diamond drill holes	Westminer
DNR-85-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-038	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-129	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE: SAMPLE INTERVAL — SAMPLE No.

LINE DEFINITIONS: Pit Outlines

DRILL HOLE LEGEND: MINOR LITHOLOGY

STRUCTURE: Shear

INTERPRETED GEOLOGY: Major Shear; Interbedded Argillite & Greywacke; Greywacke - fine grain; Greywacke - medium grain; Argillite

DRILL TRACE LITHOLOGY: VOID; Quartz Veining (>50%); Rip-up marker Unit; Greywacke; Greywacke with lesser Argillite; Argillite with lesser Greywacke; Argillite; Overburden

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SCALE 1:1000 METRES

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PROJECT No 06-1118-041C REV A

TITLE
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FIGURE C-2

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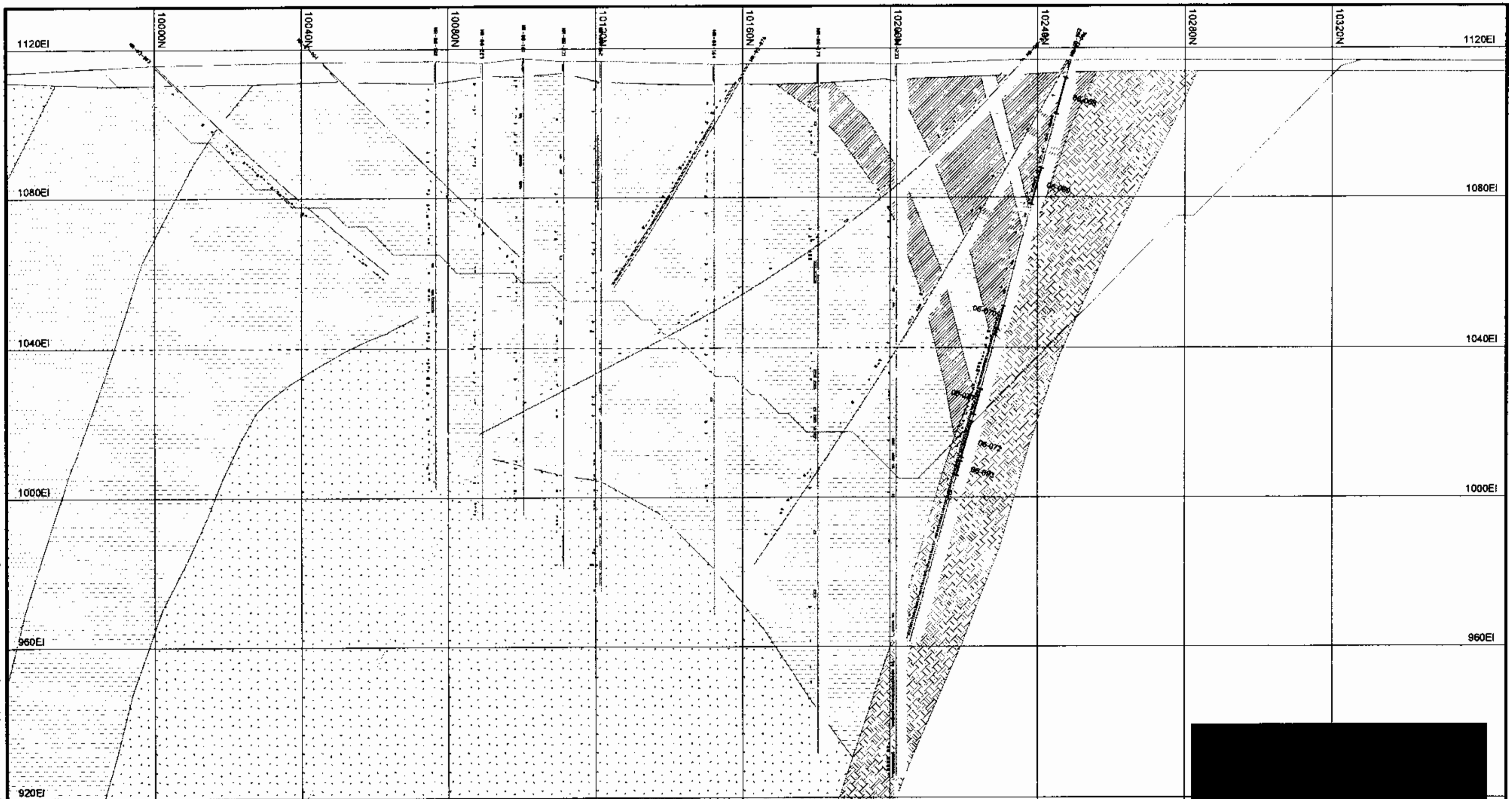

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Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	109	Resource definition diamond drill holes	Westminer
DNR-95-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-036	37	Resource definition diamond drill holes	Moose River Resources Inc
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-129	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE	LINE DEFINITIONS	DRILL HOLE LEGEND	STRUCTURE	INTERPRETED GEOLOGY	DRILL TRACE LITHOLOGY
SAMPLE INTERVAL; 06-071 — SAMPLE No.	Pit Outlines	MINOR LITHOLOGY	Shear	Major Shear; Interbedded Argillite & Greywacke; Greywacke - fine grain; Greywacke - medium grain; Argillite	VOID; Quartz Veining (>50%); Rip-up marker Unit; Greywacke; Greywacke with lesser Argillite; Argillite with lesser Grewacke; Argillite; Overburden

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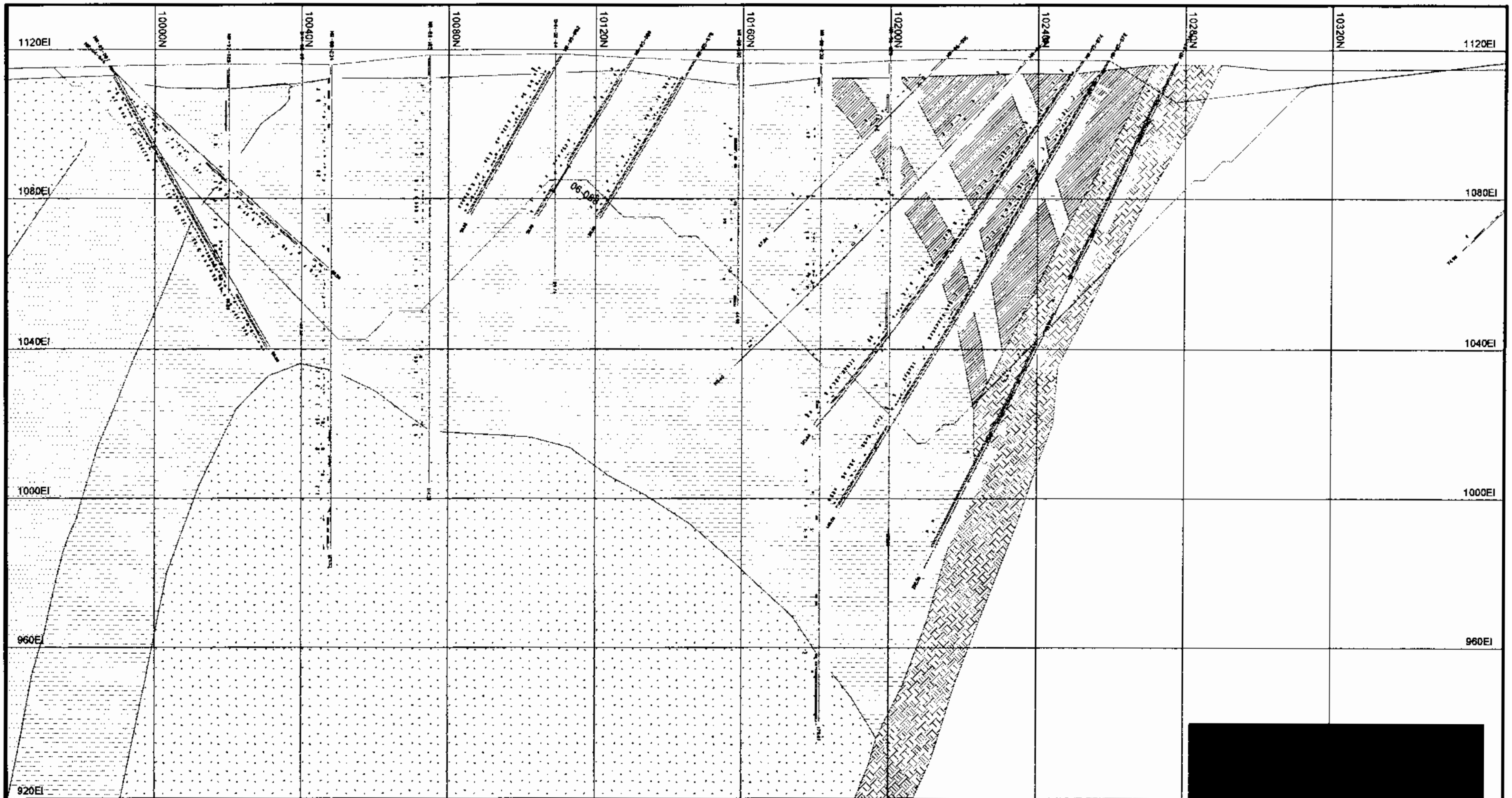

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Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	108	Resource definition diamond drill holes	Westminer
DNR-95-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-038	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-129	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE	LINE DEFINITIONS	DRILL HOLE LEGEND	STRUCTURE	INTERPRETED GEOLOGY	DRILL TRACE LITHOLOGY
SAMPLE INTERVAL; 89-071 — SAMPLE No.	Pit Outlines	MINOR LITHOLOGY	Shear	Major Shear Interbeded Argillite & Greywacke Greywacke - fine grain Greywacke - medium grain Argillite	VOID Quartz Veining (>50%) Rip-up marker Unit Greywacke Greywacke with lesser Argillite Argillite with lesser Grewacke Argillite Overburden

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TOUQUOY DEPOSIT SECTION 21725 EAST

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FIGURE C-4

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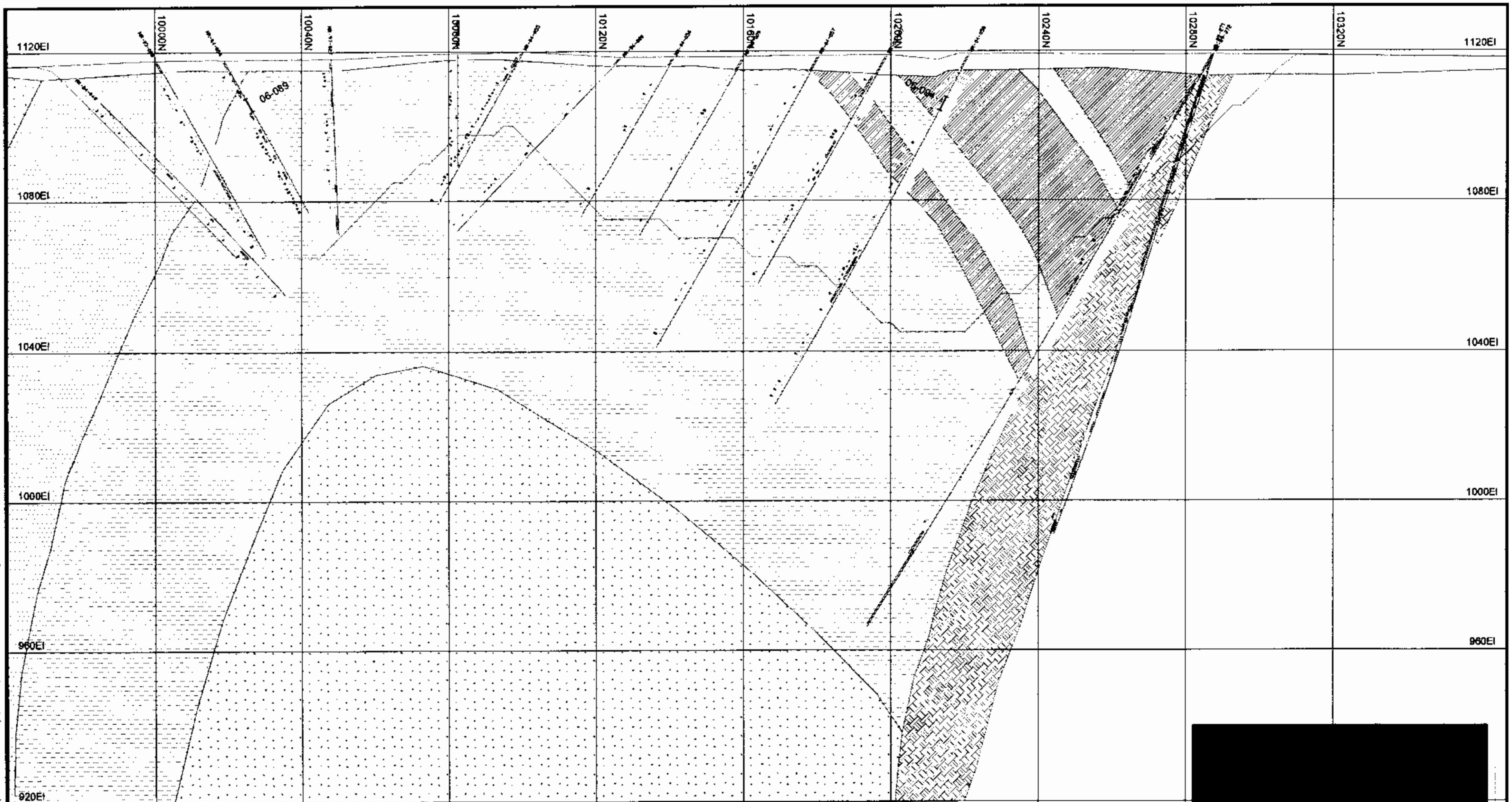

Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	109	Resource definition diamond drill holes	Westminer
DNR-95-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-038	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-126	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE: SAMPLE INTERVAL; 88-871 — SAMPLE No.

LINE DEFINITIONS: Pit Outlines

DRILL HOLE LEGEND: MINOR LITHOLOGY

STRUCTURE: Shear

INTERPRETED GEOLOGY
- Major Shear
- Interbeded Argillite & Greywacke
- Greywacke - fine grain
- Greywacke - medium grain
- Argillite

DRILL TRACE LITHOLOGY
- VOID
- Quartz Veining (>50%)
- Rip-up marker Unit
- Greywacke
- Greywacke with lesser Argillite
- Argillite with lesser Grewacke
- Argillite
- Overburden

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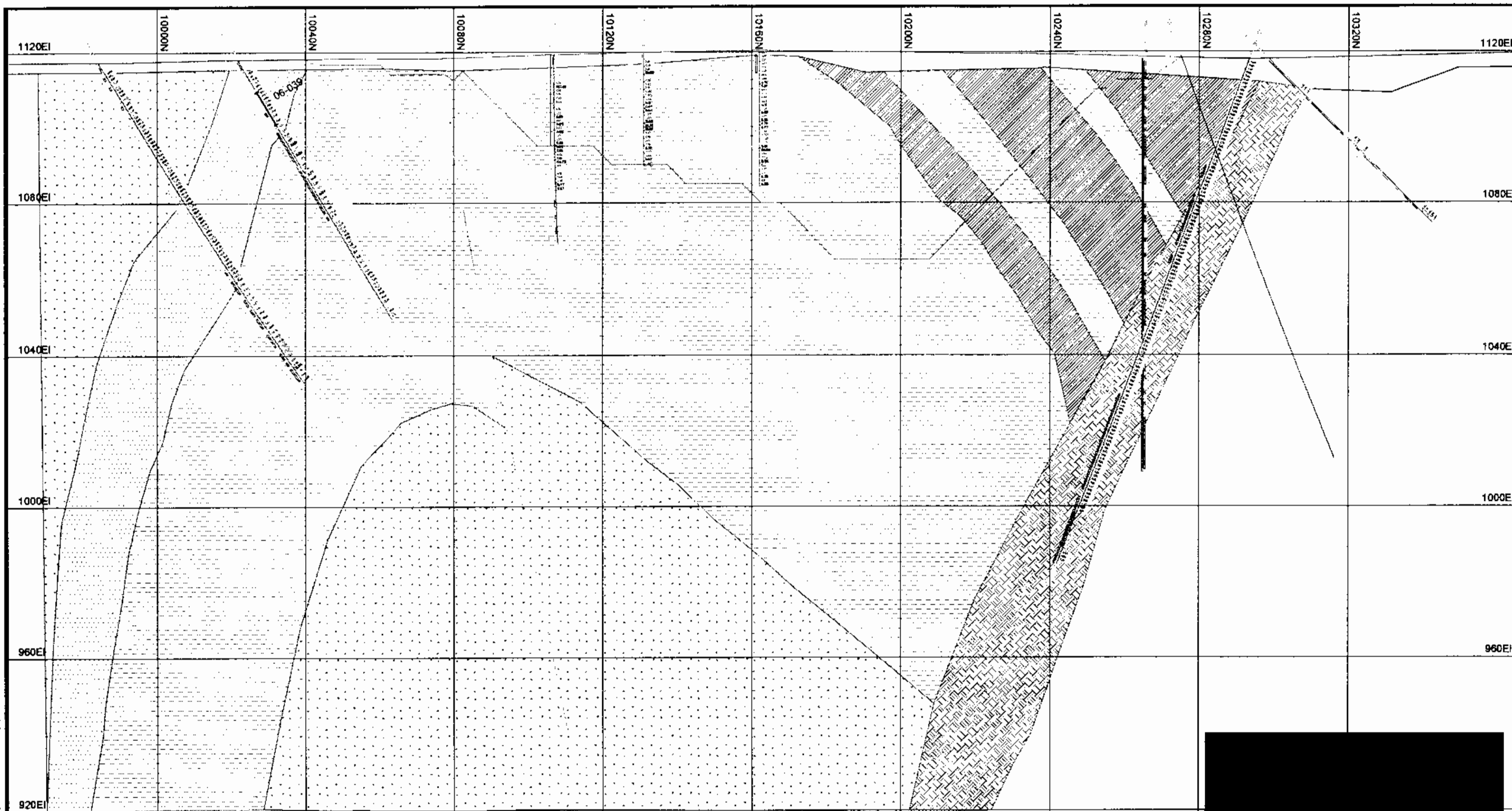

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Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	109	Resource definition diamond drill holes	Westminer
DNR-85-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-038	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Auregin
MR-03-001 to MR-05-128	128	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE	LINE DEFINITIONS	DRILL HOLE LEGEND	STRUCTURE	INTERPRETED GEOLOGY	DRILL TRACE LITHOLOGY
SAMPLE INTERVAL; 06-071 — SAMPLE No.	Pit Outlines	MINOR LITHOLOGY	Shear	Major Shear; Interbedded Argillite & Greywacke; Greywacke - fine grain; Greywacke - medium grain; Argillite	VOID; Quartz Veining (>50%); Rip-up marker Unit; Greywacke; Greywacke with lesser Argillite; Argillite with lesser Greywacke; Argillite; Overburden

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FIGURE C-6

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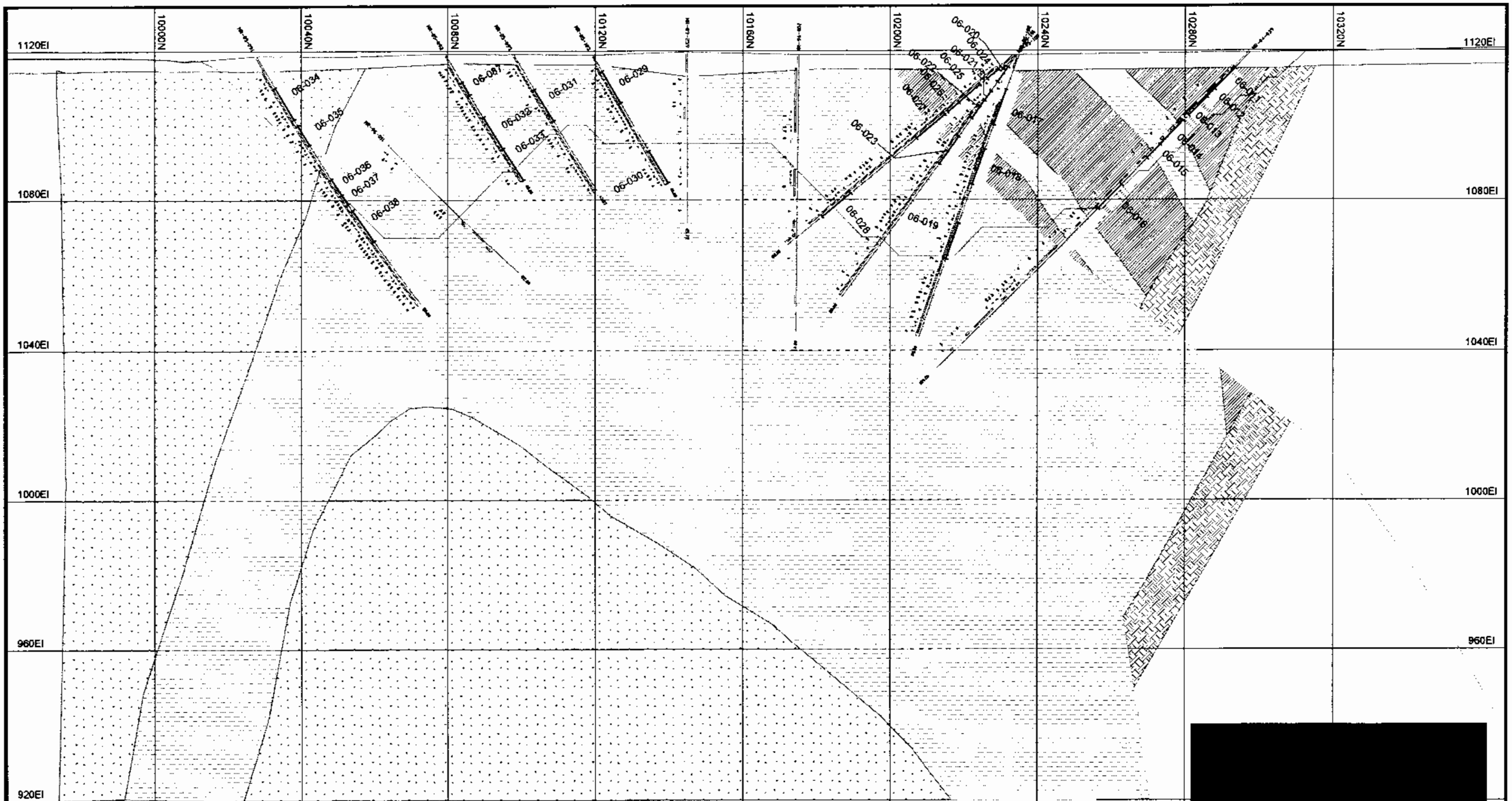

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Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	109	Resource definition diamond drill holes	Westminer
DNR-95-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-86-001 to MR-87-038	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-129	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE	LINE DEFINITIONS	DRILL HOLE LEGEND	STRUCTURE	INTERPRETED GEOLOGY	DRILL TRACE LITHOLOGY
SAMPLE INTERVAL — 86-077 — SAMPLE No.	Pit Outlines	MINOR LITHOLOGY	Shear	Major Shear Interbedded Argillite & Greywacke Greywacke - fine grain Greywacke - medium grain Argillite	VOID Quartz Veining (>50%) Rip-up marker Unit Greywacke Greywacke with lesser Argillite Argillite with lesser Greywacke Argillite Overburden

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TITLE
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ATLANTIC GOLD N.L.

FIGURE C-7

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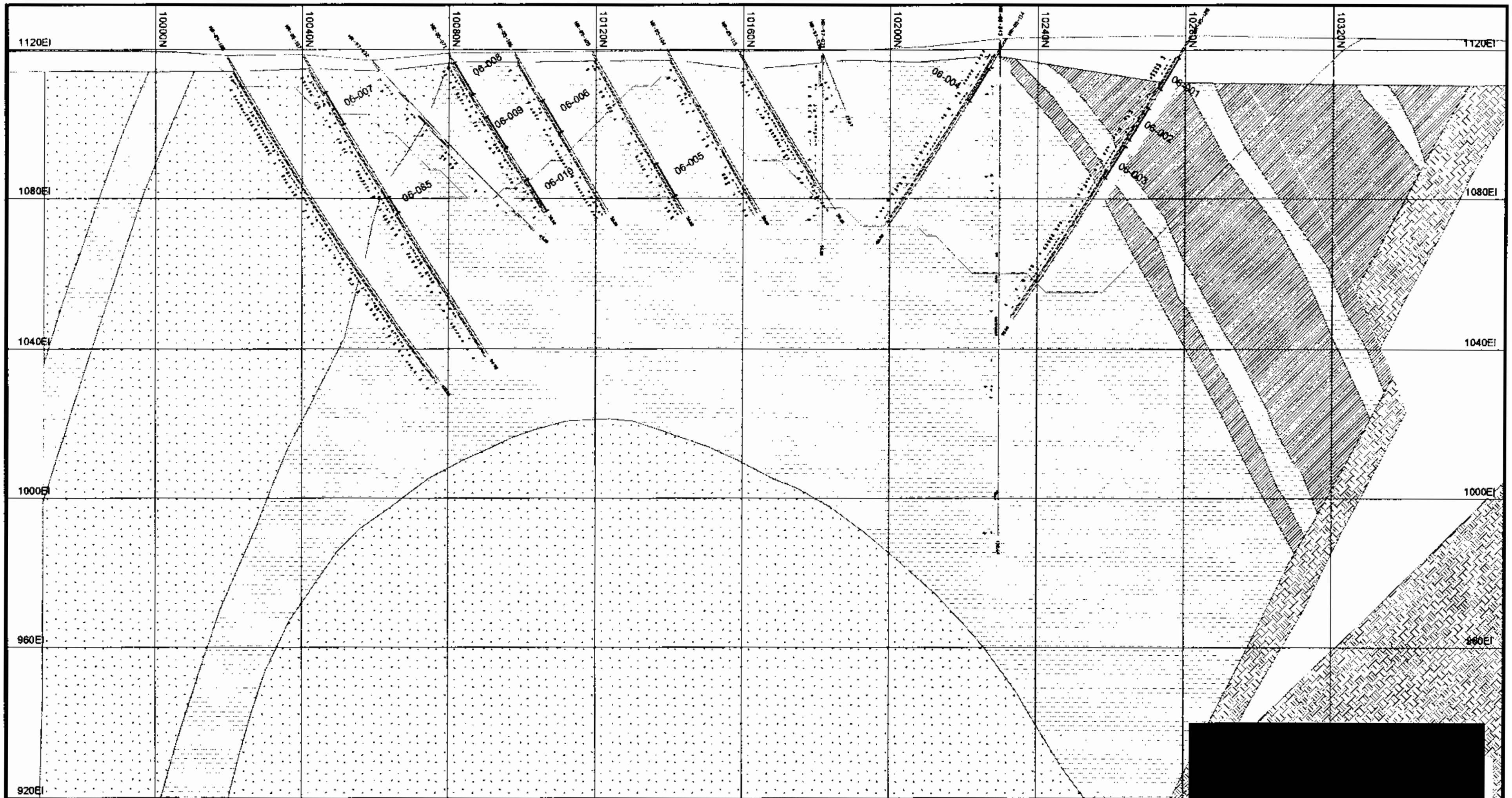

Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	109	Resource definition diamond drill holes	Westminer
DNR-95-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-038	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-129	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE	LINE DEFINITIONS	DRILL HOLE LEGEND	STRUCTURE	INTERPRETED GEOLOGY	DRILL TRACE LITHOLOGY
SAMPLE INTERVAL — SAMPLE No.	Pit Outlines	MINOR LITHOLOGY	Shear	Major Shear Interbedded Argillite & Greywacke Greywacke - fine grain Greywacke - medium grain Argillite	VOID Quartz Veining (>50%) Rip-up marker Unit Greywacke Greywacke with lesser Argillite Argillite with lesser Grewacke Argillite Overburden

20 0 20 40
SCALE 1:1000 METRES

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ATLANTIC GOLD N.L.

FIGURE C-8

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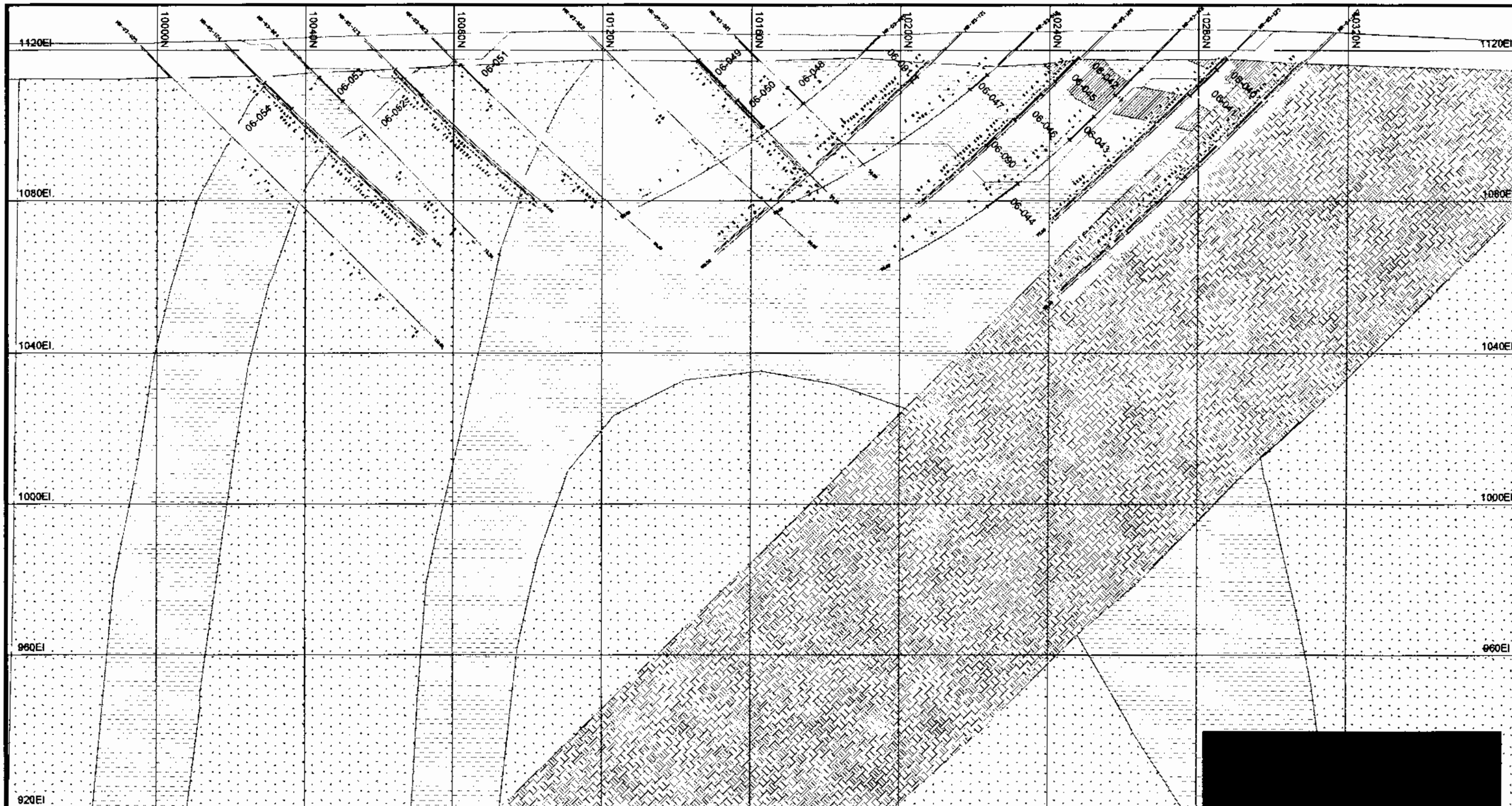

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Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-88-144 to MR-89-272	108	Resource definition diamond drill holes	Westminer
DNR-85-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-038	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-129	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE	LINE DEFINITIONS	DRILL HOLE LEGEND	STRUCTURE	INTERPRETED GEOLOGY	DRILL TRACE LITHOLOGY
SAMPLE INTERVAL; 06-071 — SAMPLE No.	Pit Outlines	MINOR LITHOLOGY	Shear	Major Shear; Interbedded Argillite & Greywacke; Greywacke - fine grain; Greywacke - medium grain; Argillite	VOID; Quartz Veining (>50%); Rip-up marker Unit; Greywacke; Greywacke with lesser Argillite; Argillite with lesser Greywacke; Argillite; Overburden

20 0 20 40
SCALE 1:1000 METRES

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TOUQUOY DEPOSIT
SECTION 22075 EAST

ATLANTIC GOLD N.L.

FIGURE C-9

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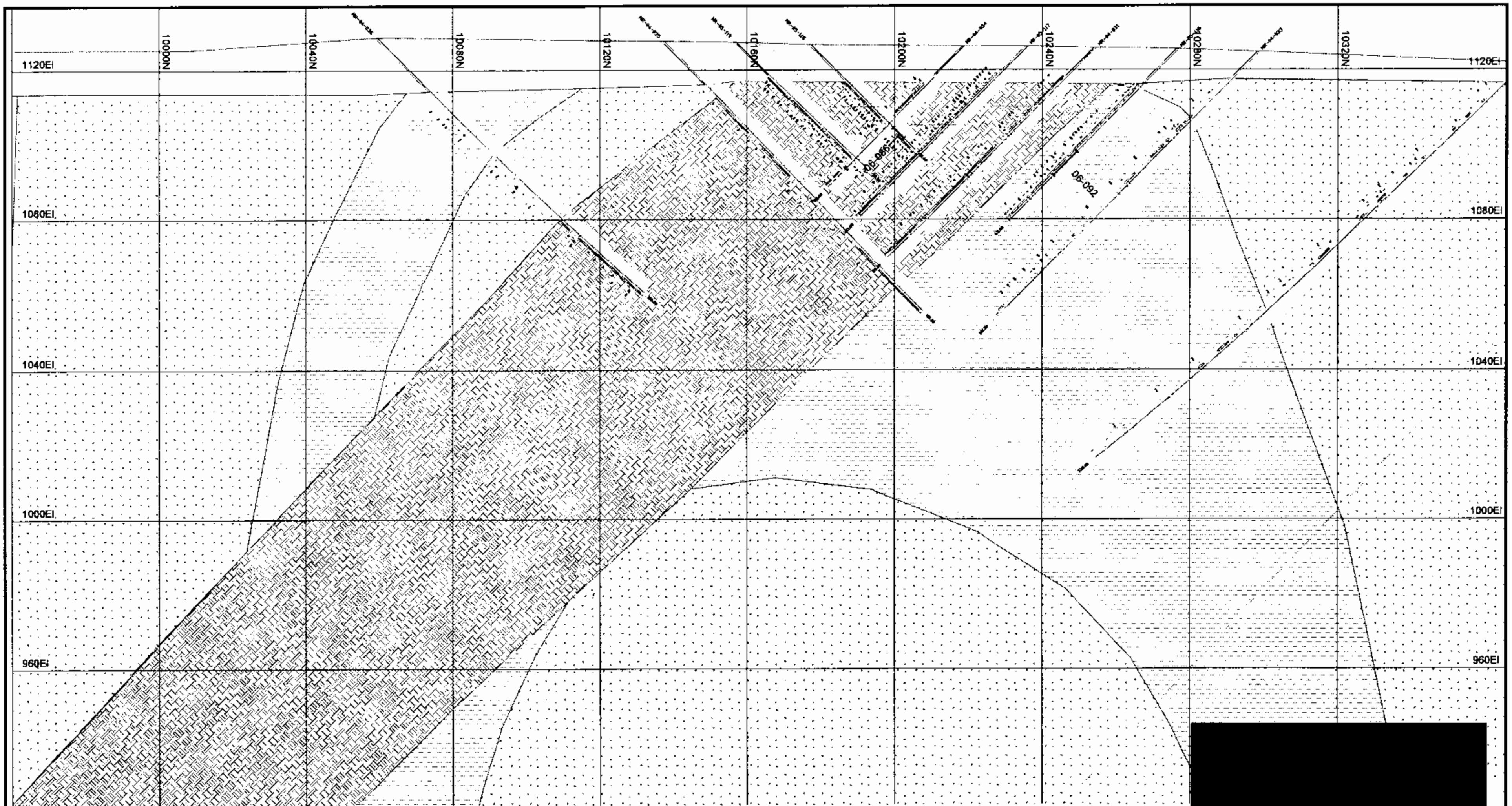

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Hole IDs	No. of holes	Hole Types	Exploration Company
MR-86-045 to MR-87-123	17	Resource definition diamond drill holes	Seabright
MR-86-144 to MR-89-272	109	Resource definition diamond drill holes	Westminer
ONR-95-002	1	Resource definition diamond drill holes	Nova Scotia Department of Natural Resources
MR-96-001 to MR-97-038	37	Resource definition diamond drill holes	Moose River Resources Inc.
AU-02-01	1	Resource definition diamond drill holes	Aurogin
MR-03-001 to MR-05-129	129	Resource definition diamond drill holes	DDV Gold (Atlantic Gold)
MR-05-ME01 to MR-05-ME04	4	Metallurgical diamond drill holes	DDV Gold (Atlantic Gold)
MR-06-GT01 to MR-06-GT06	7	Geotechnical diamond drill holes	DDV Gold (Atlantic Gold)

SAMPLE	LINE DEFINITIONS	DRILL HOLE LEGEND	STRUCTURE	INTERPRETED GEOLOGY	DRILL TRACE LITHOLOGY
SAMPLE INTERVAL — SAMPLE No	Pit Outlines	MINOR LITHOLOGY	Shear	Major Shear Interbedded Argillite & Greywacke Greywacke - fine grain Greywacke - medium grain Argillite	VOID Quartz Veining (>50%) Rip-up marker Unit Greywacke Greywacke with lesser Argillite Argillite with lesser Greywacke Argillite Overburden

SCALE 1:1000 — 20 0 20 40 METRES

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Mississauga, Ontario, Canada

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SECTION 22150 EAST

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FIGURE C-10

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APPENDIX D

SGS LAKEFIELD (2006) WASTE ROCK MINERALOGICAL REPORT

An Investigation into

MINERALOGICAL CHARACTERIZATION OF FIVE WASTE ROCK SAMPLES, TOUQUOY GEOCHEMISTRY PROGRAM

prepared for

DDV GOLD

LR 11373-001 – MI5020-AUG06
October 30, 2006

This report refers to the samples as received.

The practice of this Company in issuing reports of this nature is to require the recipient not to publish the report or any part thereof without the written consent of SGS Minerals Services.

Table of Contents

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List of Tables

List of Figures

Introduction

Five waste rock samples (listed in Table 1 below) were submitted to Mineral Technologies for mineralogical examination. The purpose of the investigation was to determine the bulk mineral assemblage and textural characteristics of the mineral species within the sample. The sample was also investigated for its acid generation (AG) and/or neutralization potential (NP) based on the proportion of sulphide and carbonate minerals and their respective textural associations in each sample. The mineralogical examinations included X-ray diffraction analysis (XRD), optical microscopy, and scanning electron microscopy (SEM) equipped with an energy dispersive X-ray spectrometer (EDS).

Table 1. List of Samples

[illegible]	[illegible]	**Hole**	**From**	**To**	**Lithology**	**Lithology Description**
	[illegible]	[illegible]	[illegible]			
[illegible]	06-034	MR-05-091	10	20	G/A	Greywacke with 20-50% argilli[illegible]
[illegible]	[illegible]	MR-05-122	10	20	AR	Argillite (< 5% greywacke)
[illegible]	06-066	MR-05-084	65	72	GW	Greywacke with <20% argillite [illegible]
[illegible]	06-070	MR-05-083	68	75	Comp	Composite GW/AR
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Argillite (< 5% greywacke)

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Summary

Procedures

To ensure sample homogeneity, each as-received sample was initially screened at 16 mesh (1.2 mm), and the retained 16 mesh material was stage-crushed to passing 16 mesh and re-combined. A representative sub-sample of material was pulverized and submitted for X-ray diffraction (XRD) analysis, in order to determine the bulk crystalline mineral assemblage. XRD results are presented in Appendix 2.

One polished section and one polished thin section per sample were prepared from a representative sub-sample of -16 mesh material, as well as the original as-received material. Each polished section was examined optically with a petrographic microscope under incident (reflected) and transmitted light at 50x to 500x magnifications. The mineral assemblage and modal abundance of the sample were determined by compiling both optical data from manual point counting with a bulk mineral analysis (BMA) generated by QEMSCAN technology (results are presented in Table 2). Weight percentages of minerals were calculated from volume percentage using standard grain densities and documented mineral chemistries. A summary of the major calculated elemental oxides for each sample by mineralogical analysis is compared to the whole rock analysis (WRA) of each sample in assay reconciliation tables (presented in Appendix 1). The liberation characteristics of sulphide and carbonate minerals were determined by QEMSCAN analysis, where >95% of the target mineral from a line segment was considered liberated. For each sample, photomicrographs were taken to illustrate relevant textural and association data of the sulphide/carbonate minerals. Individual sample summaries including modal analysis, grain size, assay reconciliation, and photomicrographs are presented in Appendix

[illegible] Mineralogical Results

[illegible] *Modal Analyses*

Combined microscopic and SEM examination of the five waste rock samples indicate that they are composed primarily of silicates (varying between 85 and 92 wt. % amongst the samples). Minor amounts of carbonates (4.1 to 7.6 wt. %), sulphides (1.7 to 4.6 wt. %) and Fe-Ti oxides (1.0 to 1.9 wt. %) are also present, as well as trace amounts of sulphates (< 0.2 wt. %) and phosphates (<0.3 wt. %). A summary of the bulk mineralogy of the five waste rock samples is presented below in Table 2.

Table 2. Summary modal analyses by optical/Q[illegible]SCAN analysis

[illegible]	[illegible] chemical composition	[illegible]				
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Ca(Fe,Mg,Mn)(CO[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pyrite	FeS_2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pyrrhotite	Fe[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chalcopyrite	$CuFeS_2$	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] ***Assay Reconciliation***

In general, reconciliation of calculated mineralogical assay versus direct chemical assay is good, demonstrating confidence in mineralogical results (see reconciliation Tables in Appendix 1). Due to the coarse-grained nature of the sulphide minerals (200 µm up to 1 mm), a slight over-estimation of elemental sulphur by calculated mineralogical assay occurs due to this sulphide "nugget" effect. Similarly, carbonate minerals occur as large, coarse-grained clasts thus may be over-estimated due to a nugget particle effect. Documented mineral chemistries are used for mineralogical assay reconciliation tables for all minerals; therefore actual mineral chemistries will vary slightly from calculated 'book' values.

[illegible]

Quartz is the main silicate mineral present in all samples, ranging from 28 to 40 wt. % of sample, with the exception of samples 06-049 and 06-073, in which muscovite is either fairly equivalent in abundance to quartz (06-049) or predominates over quartz (06-073). Quartz appears to have a bi-modal distribution in grain size, occurring as both coarse blocky grains interstitial to fine-grained foliated particles (see Appendix 1, Figs. 8 and 19), and as fine grains, interstitial to foliated phyllosilicates consisting of muscovite and chlorite (A1, Fig.12).

Plagioclase feldspar predominates over K-feldspar, with the exception of samples 06-049 and 06-073, in which K-feldspar is predominant. SEM-EDS analysis of plagioclase shows a Na-rich end-member composition of albite for all samples. Feldspar grains typically occur together with quartz interstitial to phyllosilicates. K-feldspar commonly shows alteration to sericite and clay minerals among the samples.

Muscovite is the main phyllosilicate mineral present in all samples, followed by chlorite, both defining the foliation in the waste rock clasts (A1, Figs. 11 and 12). Muscovite commonly shows alteration to illite.

Other silicates that are present in trace proportions (typically < 0.2 wt. % of sample) include garnet, epidote, amphibole, pyroxene, talc and accessory zircon.

[illegible] [illegible]

Magnetite, ilmenite and rutile are the main Fe- and Ti-oxide minerals present in all samples. The oxide minerals typically occur interstitial to silicate minerals within laminated particles (A1, Fig. [illegible]

[illegible] [illegible]

Gypsum is the main sulphate mineral and occurs in trace amounts as attachments to silicate mineral particles. Rare Fe-sulphate is also present

[illegible] Phosphates

Trace amounts of apatite typically occur as fine inclusions within feldspar.

[illegible] [illegible]

Carbonate minerals occur in minor amounts in all samples. Calcite is the main carbonate mineral among the five waste rock samples (ranging from 68% to 99% of total carbonate). Lesser amounts of dolomite and ankerite were also detected, as well as rare siderite. A complete breakdown of the carbonate mineral species, per sample basis, is presented in Table 3 below.

Table 3. Carbonate mineral species distribution

	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Ca(Fe,Mg,Mn)(CO[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Although the chemistry will dictate the carbonate neutralization potential (NP), its association will also have an impact on its availability for neutralization. In all samples, the majority of carbonates in the sample are typically liberated or exposed (ranging from 53% to 78%), and thus, are amenable to dissolution and neutralization. A lesser amount (22 to 47% among the samples occur as locked inclusions, unavailable for neutralization. A graphical representation for those neutralizing minerals (calcite, dolomite and ankerite) is presented in Figure 1 below.

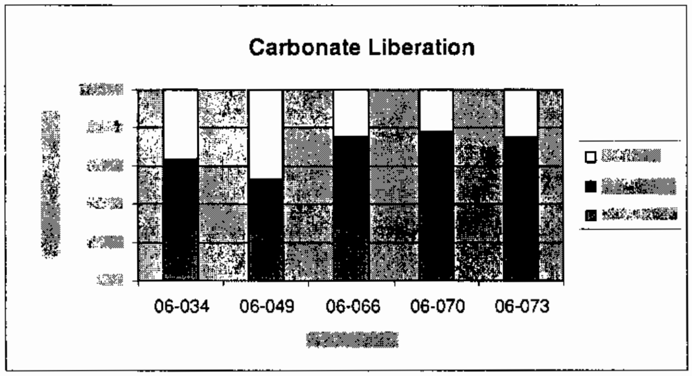

Figure 1. Carbonate association graph

[illegible]

Sulphides occur in minor proportions in all samples. The distribution of sulphide minerals varies across all samples. Pyrite is the most abundant sulphide mineral present in sample 06-070 (98% of total sulphides). Arsenopyrite is the most abundant sulphide mineral in samples 06-034 (87% of total sulphides) and 06-066 (58% of total sulphides). In sample 06-049, pyrrhotite is the predominant sulphide (40% of total sulphides) followed by arsenopyrite (36% of total sulphides) and pyrite (24% of total sulphides). In sample 06-073, pyrite and arsenopyrite are the predominant sulphides showing 44% and 42% distribution of the sulphides among the samples, respectively. A complete breakdown of the sulphide mineral speciation is presented in Table 4 [illegible]

Table 4. Sulphide mineral species distribution

	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

As pyrite, pyrrhotite and arsenopyrite minerals may all contribute to acidity under oxidizing conditions, their textural associations were examined in detail. Pyrite typically shows high degrees of locking, with over half (50% to 80%) among all samples locked within silicate particles. Figure 2 shows a summary association graph for pyrite among the samples.

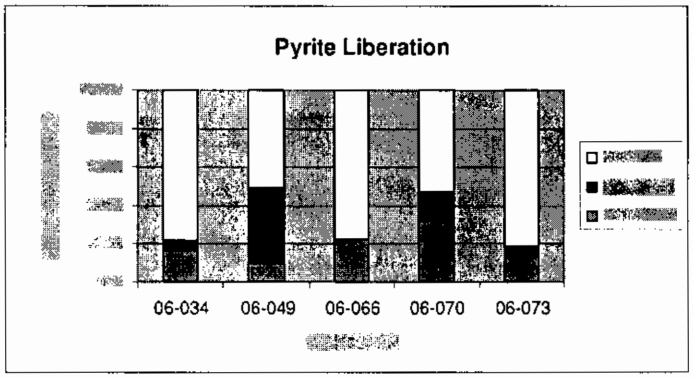

Figure 2. Pyrite association graph

Pyrrhotite typically occurs as locked (50 to 100% of total pyrrhotite) or exposed grains (01 to 50% of total pyrrhotite), with only trace amounts as liberated grains (< 1% of total pyrrhotite). Figure 3 shows the association of pyrrhotite among the samples.

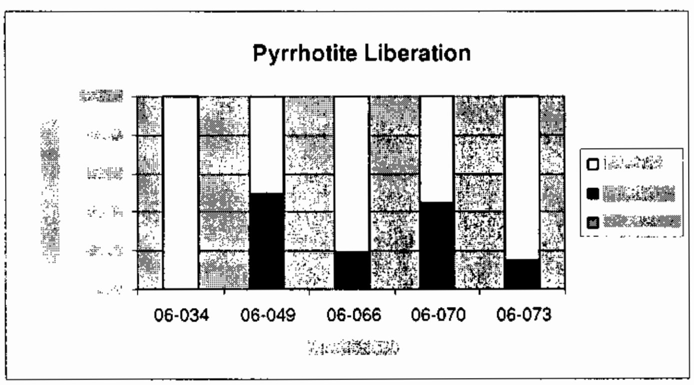

Figure 3. Pyrrhotite association graph

In comparison, arsenopyrite commonly occurs as large liberated grains (46% to 100% liberated). Only minor proportions occur locked (0% to 26%). Figure 4 shows the association of arsenopyrite among the samples.

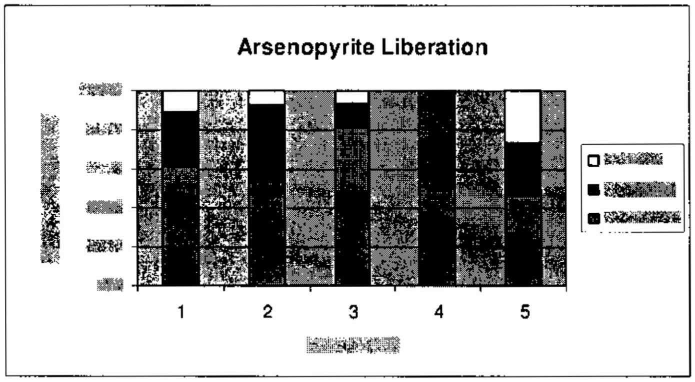

Figure 4. Arsenopyrite association graph

Summary of Sulphide and Carbonate Minerals

A summary of the sulphide and carbonate mineral species is presented in Table 5 below.

Table 5. Summary of carbonate and sulphide minerals by sample

[illegible]	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Ca(Fe,Mg,Mn)(CO[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

The carbonate mineralogy consists mainly of Ca-rich carbonates (calcite, dolomite, and ankerite) which provide the highest degree of neutralization among the carbonate minerals. These carbonate minerals also show a high degree of availability, suggesting a large neutralizing source. Only a minor amount of siderite or Fe-carbonate (< 0.5 wt. % distribution) is found among the samples.

Among the samples, a high proportion of pyrite and pyrrhotite show locking characteristics, typically occurring as inclusions or attachments to silicate mineral particles. This textural association suggests they will not contribute to any significant AG due to their encapsulation. Alternatively, arsenopyrite (the only As-bearing mineral among the samples) shows a high degree of liberation (> 50% up to 99%) among the sa[illegible]

[illegible] Conclusions

- Among each waste rock sample examined, there is a higher proportion of carbonate minerals to sulphide minerals. The carbonate to sulphide ratio varies from 1.2 to 2.4 among the waste rocks (see Table 6 below). The carbonate associations as mainly exposed or liberated grains (53% to 78% of total carbonates) suggest there may be sufficient NP among these samples to react with any acidity generated by the oxidation of Fe-bearing sulphides.

Table 6. Summary of carbonate/sulphide mineral content and mineralogical NP

Sample	06-034	[illegible]	06-066	06-070	06-073 [illegible]
[illegible] AGP from Sulphide	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
Carbonate/Sulphide ratio	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NP (Neutralization Potential), AGP (Acid Generation [illegible]

Note: total carbonate values exclude siderite which does not contribute to NP, and all values are disrespcective of sulphide/carbonate liberation

- Samples showing carbonate/sulphide ratios >2 (06-034 and 06-066) indicate probable net acid neutralizing conditions. Those samples with ratios between 1 and 2 (06-049, 06-070, and 06-073) also suggest possible neutralizing conditions due to their textural associations among the samples.
- The large grain size and liberated nature of arsenopyrite in samples 06-049, 06-066 and 06-073, coupled with their lower carbonate/sulphide ratios, may indicate a possible concern in highly oxidizing environments for heavy metal contamination (i.e. arsenic).

Appendix 1
Mineralogical Results by Individual Sample

Table 7. Modal abundance and average grain size of sample 06-034

06-034 [redacted]	Formula or chemical composition	wt.%	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	0.003	20 to 180
[redacted]	[redacted]	0.003	10 to 140
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	10 to 300 (up to 400)
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	40 to 400 (up to 500)
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]		[redacted]	

Table 8. Assay reconciliation for sample 06-034

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
K-Feldspar (oligoclase)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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Photomicrographs: 06-034

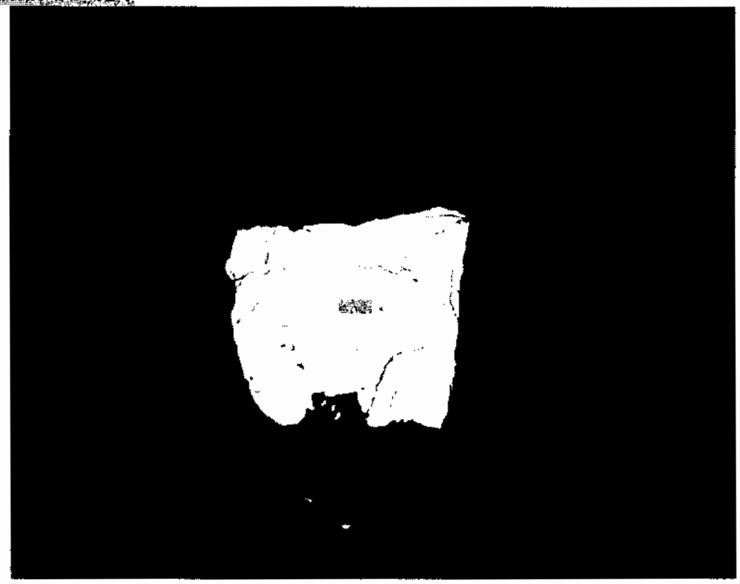

Figure 5. Sample 06-034 photomicrograph

Low magnification reflected light (RL) photomicrograph showing a large (~1.0 mm) liberated arsenopyrite grain surrounded by non-opaque minerals

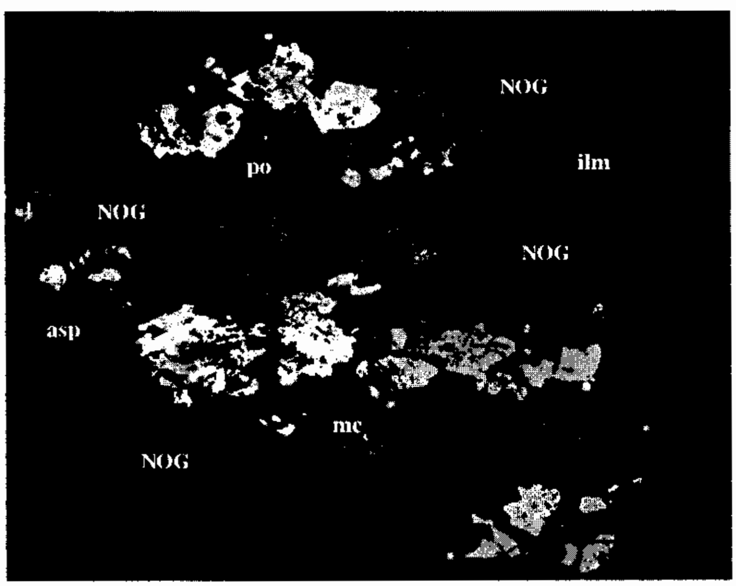

Figure 6. Sample 06-034 photomicrograph

Low magnification reflected light (RL) photomicrograph showing abundant sulphides (pyrite and/or marcasite (mc), pyrrhotite (po) and arsenopyrite (asp)) and ilmenite (ilm) as inclusions in silicate non-opaque minerals

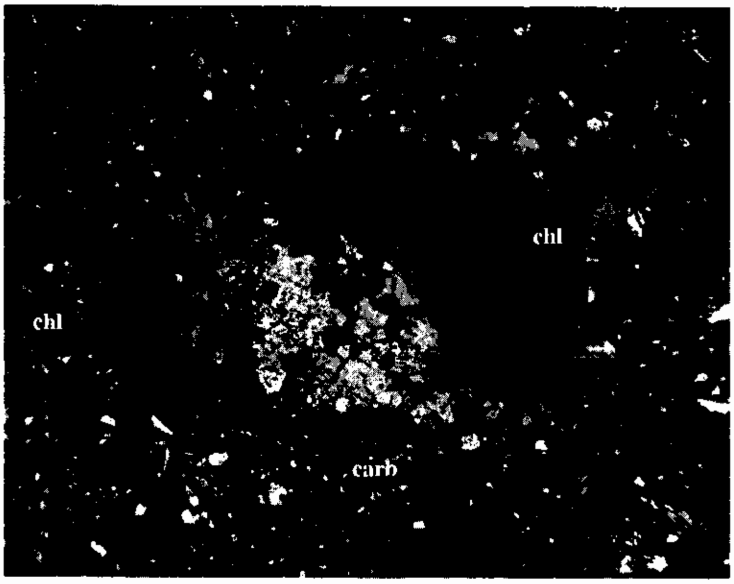

Figure 7. Sample 06-034 photomicrograph

Low magnification transmitted light (RL) photomicrograph showing a large aggregate composed of carbonate (carb) intergrown with chlorite (chl).

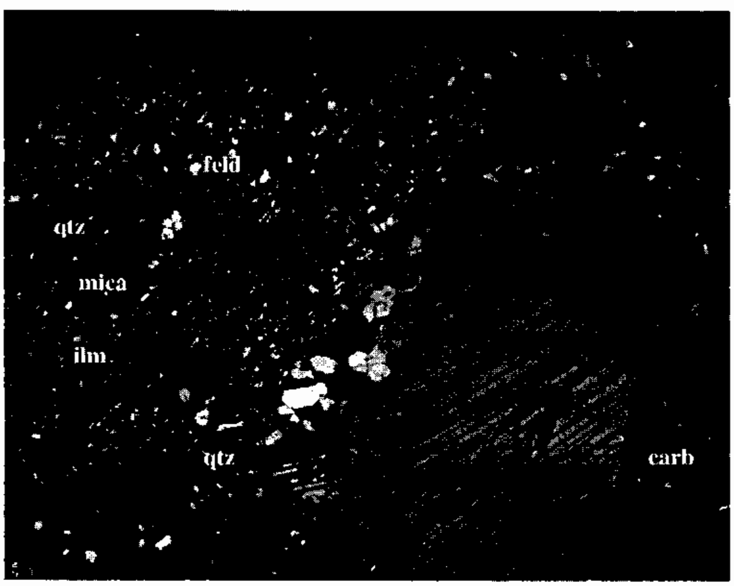

Figure 8. Sample 06-034 photomicrograph

Low magnification reflected light (RL) photomicrograph showing a large grain of carbonate (~ 1.0 mm) exposed and attached to a foliated argillite-type clast composed of quartz, feldspar, micas and Fe-Ti oxides. Note the blocky quartz at the contact between the carbonate [illegible]

Table 9. Modal abundance and average grain size of sample 06-049

06-049 [redacted]	Formula or chemical composition	wt.%	[redacted]
[redacted]	[illegible]	[redacted]	[redacted]
[redacted]	[illegible]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
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[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	

Table 10. Assay reconciliation for sample 06-049

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Photomicrographs: 06-049

Figure 9. Sample 06-049 photomicrograph

Reflected light (RL) photomicrograph showing liberated grains of arsenopyrite (asp).

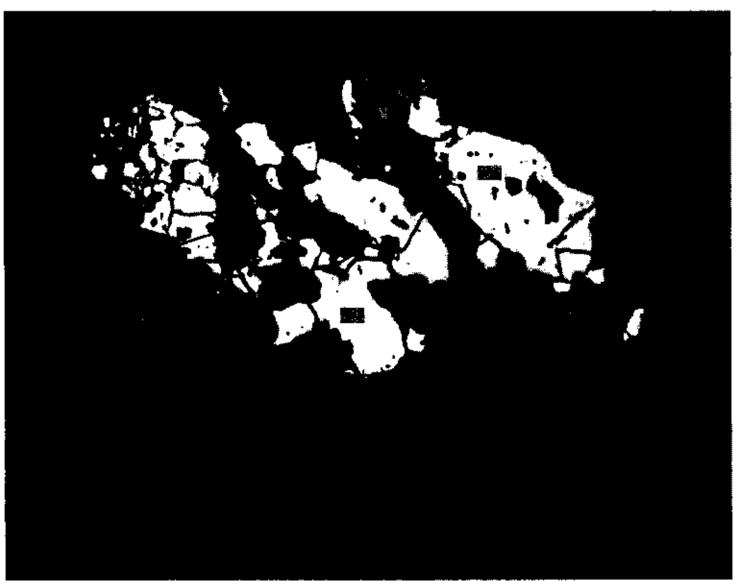

Figure 10. Sample 06-049 photomicrograph

Reflected light (RL) photomicrograph showing pyrrhotite (po) intergrown with silicates (indicated by arrows), showing parti

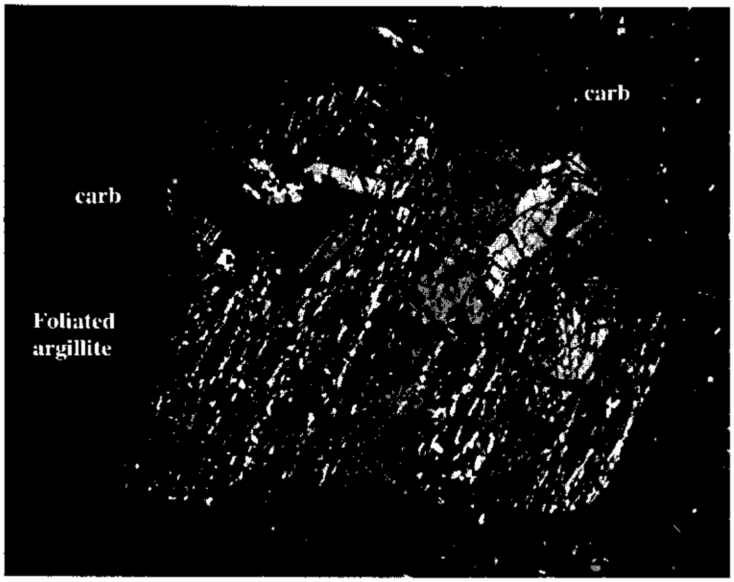

Figure 11. Sample 06-049 photomicrograph

Transmitted light (TL) photomicrograph showing bloc[illegible] interstitial to foliated argillite-type particles.

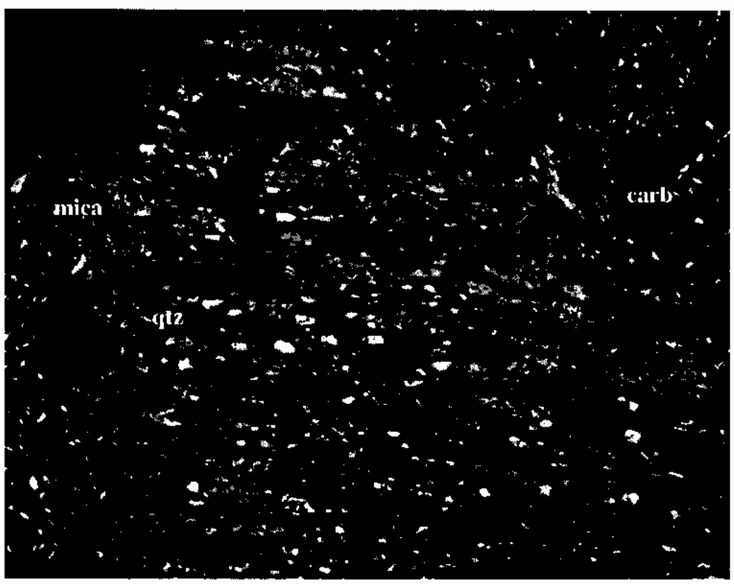

Figure 12. Sample 06-049 photomicrograph

TL photomicrograph (crossed polars) showing a carbonate-rich particle. Carbonate appears to be veining, showing parallel l[illegible] interstitial micas, quartz and feldspar.

Table 11. Modal abundance and average grain size of sample 06-066

06-066 [illegible]	Formula or chemical composition	wt %	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1.01	20 to 150 (up to 600)
[illegible]		[illegible]	

Table 12. Assay reconciliation for sample 06-066

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Photomicrographs: 06-066

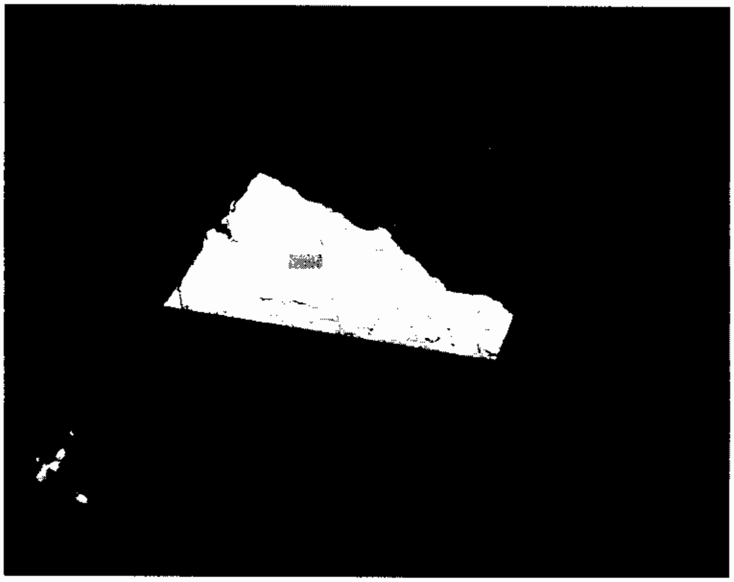

Figure 13. Sample 06-066 photomicrograph

Reflected light (RL) photomicrograph showing a liberated grain of arsenopyrite (asp).

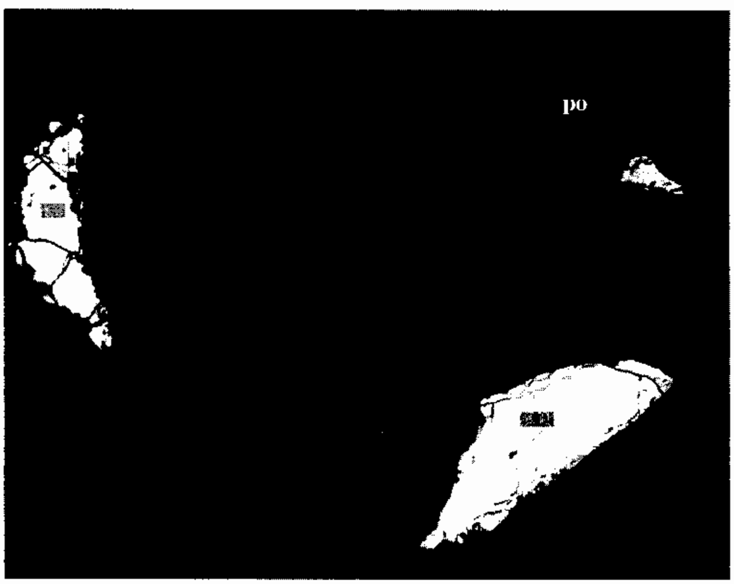

Figure 14. Sample 06-066 photomicrograph

RL photomicrograph showing exposed and liberated grains of pyrite (py), pyrrhotite (po) and arsenopyrite (asp).

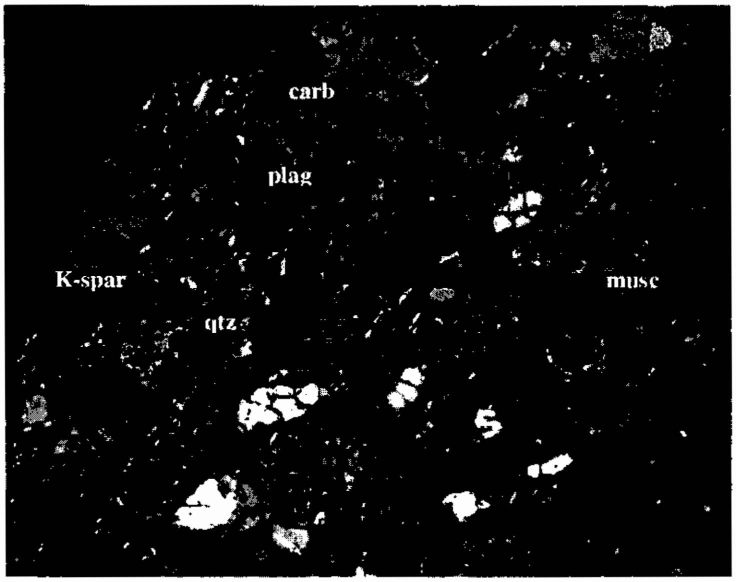

Figure 15. Sample 06-066 photomicrograph

Transmitted light (TL) photomicrograph showing a carbonate-rich particle composed of plagioclase feldspar (plag), K-feldspar (K-spar), muscovite (musc), quartz (qtz) and carbonates (carb).

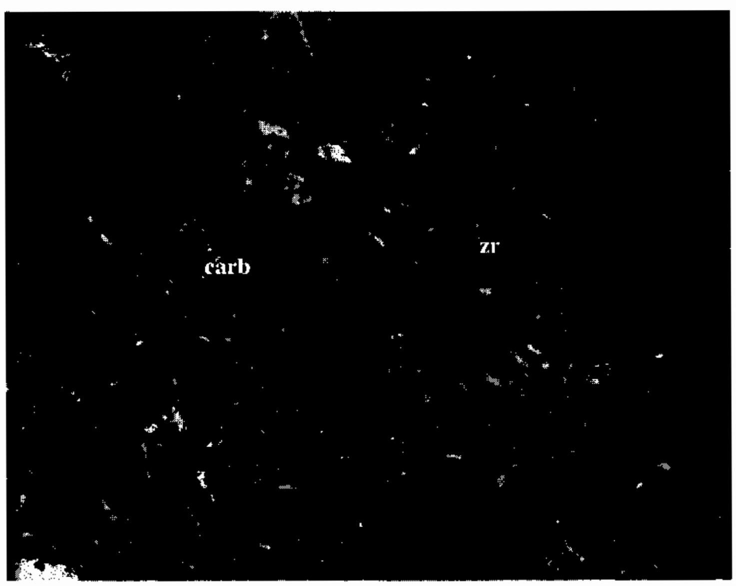

Figure 16. Sample 06-066 photomicrograph

High magnification (TL) photomicrograph showing a zircon inclusion (zr) within carbonate matrix (carb).

Table 13. Modal abundance and average grain size of sample 06-070

06-070 [illegible]	Formula or chemical composition	wt.%	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	3.74	60 to 200 (up to 400)
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	

Table 14. Assay reconciliation for sample 06-070

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Photomicrographs: 06-070

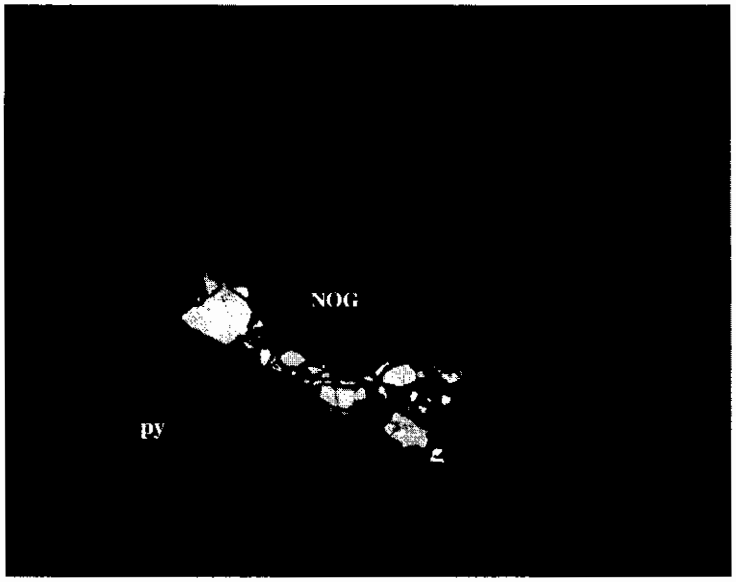

Figure 17. Sample 06-070 photomicrograph

Reflected light (RL) photomicrograph showing both attached (exposed) and liberated pyrite with silicate mineral (dark grey).

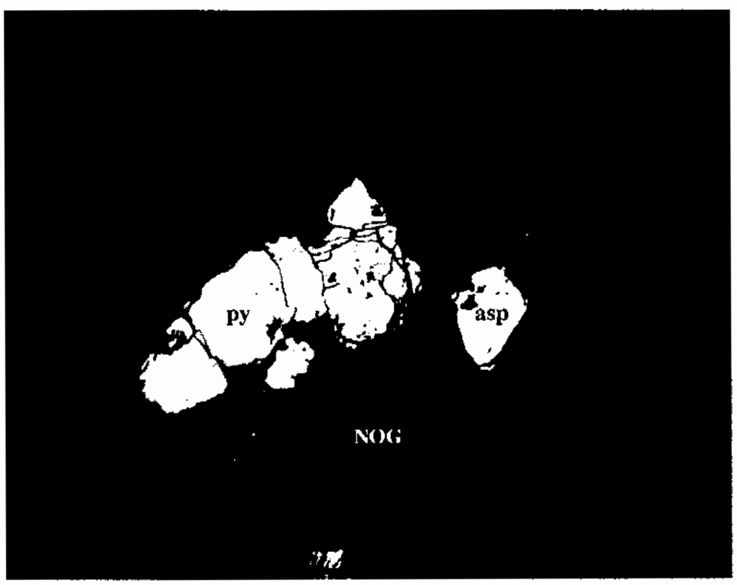

Figure 18. Sample 06-070 photomicrograph

RL photomicrograph showing exposed and liberated grains of pyrite (py) and arsenopyrite (asp).

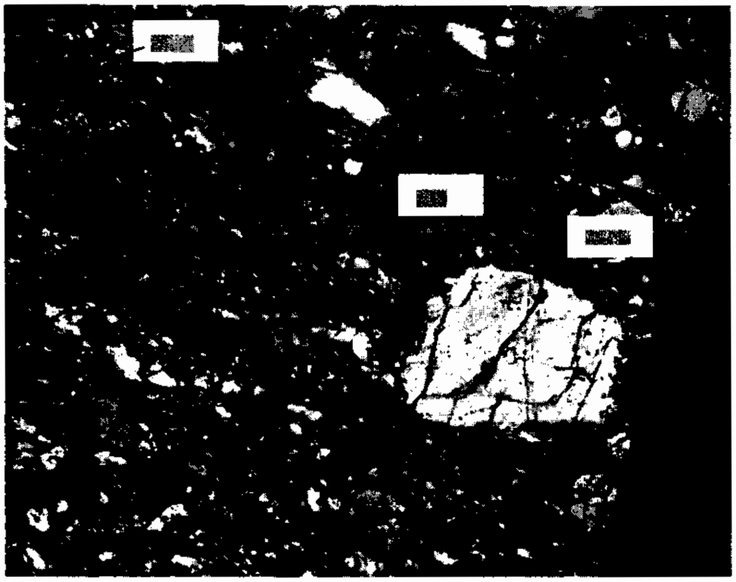

Figure 19. Sample 06-070 photomicrograph

Transmitted light (crossed polars) photomicrograph showing a carbonate-rich particle. Carbonate occurs as veinlets interstitial to silicates, and large exposed grains within this particle.

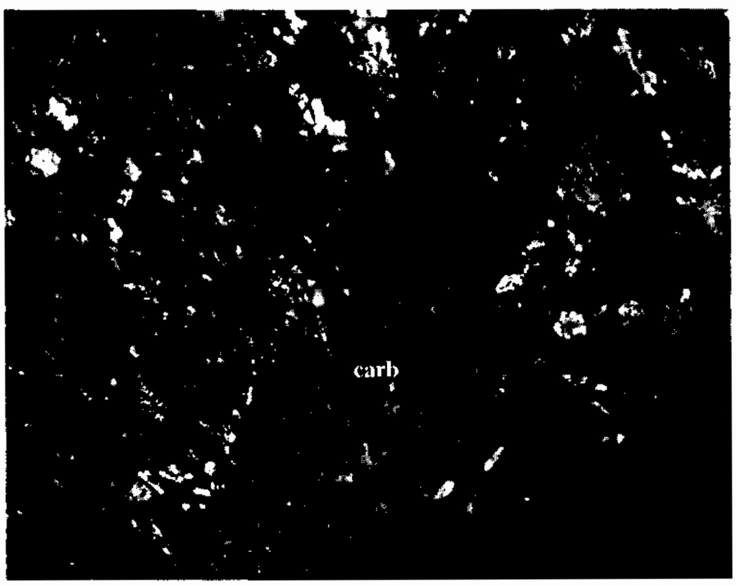

Figure 20. Sample 06-070 photomicrograph

TL photomicrograph (crossed polars) showing an exposed carbonate grain.

Table 15. Modal abundance and average grain size of sample 06-073

06-073 [redacted]	Formula or chemical composition	wt.%	[redacted]
[redacted]	[redacted]	22.8	10 to 400 (up to 1 mm)
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]		[redacted]	

Table 16. Assay reconciliation for sample 06-073

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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Photomicrographs: 06-073

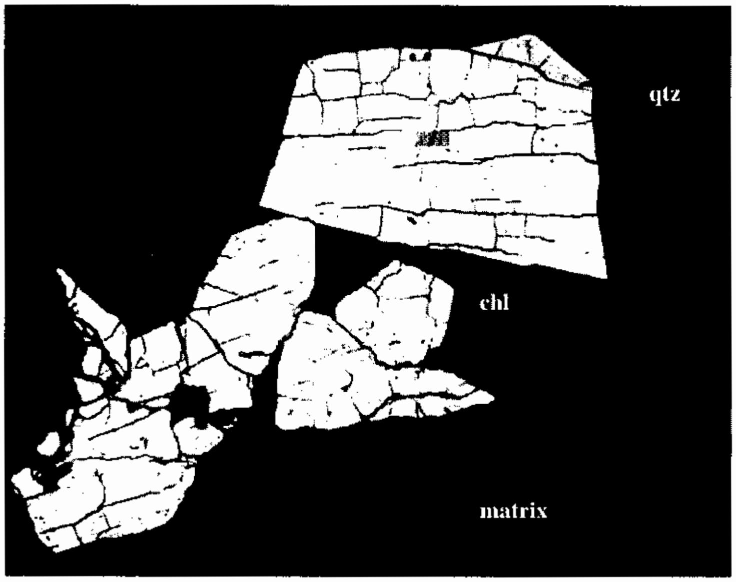


Figure 21. Sample 06-073 photomicrograph

Reflected light (RL) photomicrograph showing large [illegible] arsenopyrite (asp) with halos of quartz and chlorite within a fine-grained matrix of phyllite-type host rock.

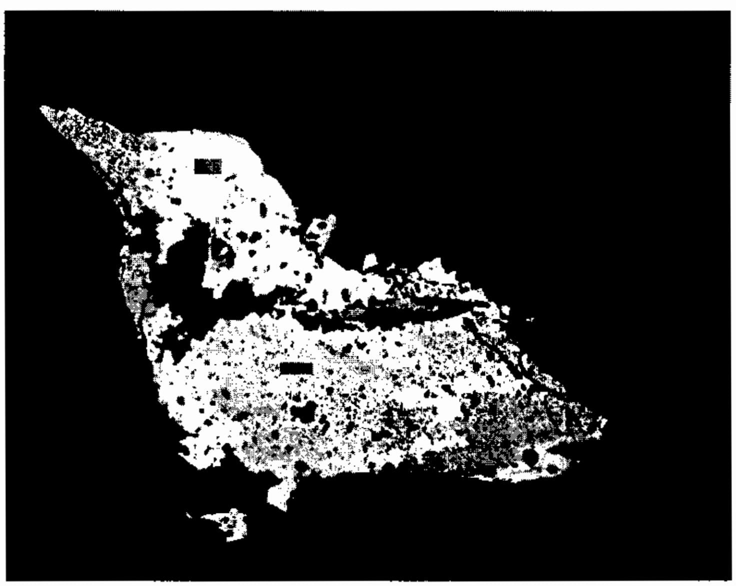


Figure 22. Sample 06-073 photomicrograph

RL photomicrograph showing a liberated coarse grain of pyrite (py) altering to marcasite (mc), showing inclusions of non-opaque gangue minerals (dark- [illegible]

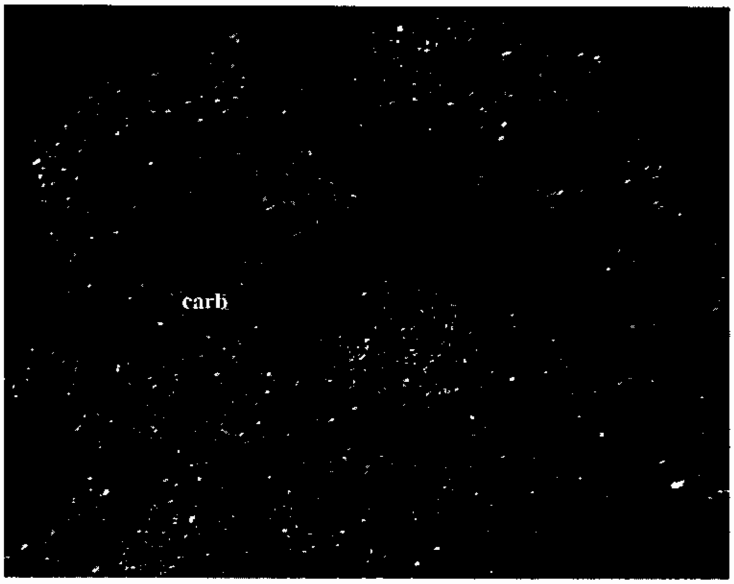


Figure 23. Sample 06-073 photomicrograph

Transmitted light (crossed polars) photomicrograph showing large carbonate (carb) clasts held within a phyllite-type host rock.

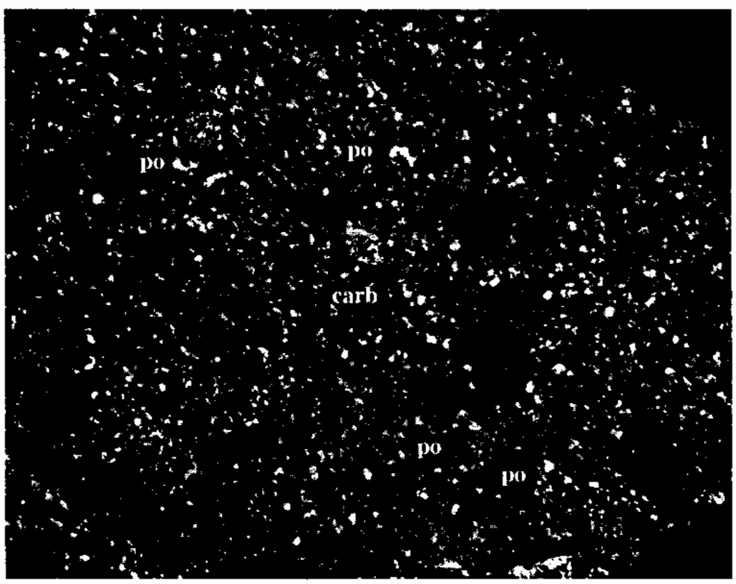


Figure 24. Sample 06-073 photomicrograph

TL photomicrograph (crossed polars) showing a carbonate-rich particle hosting inclusions of pyrrhotite.

Appendix 2
X-ray Diffraction Results

Summary of Qualitative X-ray Diffraction Results

Sample	Crystalline Mineral Assemblage (relative proportions based on peak height)			
	Major	Moderate	Minor	Trace
[illegible]	quartz	plagioclase-feldspar, mica, chlorite	calcite	*rectorite, *mordenite, *pyroxene
[illegible]	quartz	mica, chlorite, plagioclase-feldspar	calcite	*rectorite, *mordenite, *pyroxene
[illegible]	quartz	plagioclase-feldspar, mica, chlorite	calcite	*rectorite, *amphibole *mordenite, *pyroxene
[illegible]	quartz	mica, chlorite, plagioclase-feldspar		*calcite, *rectorite, *mordenite, *pyroxene
[illegible]	quartz	mica, chlorite, plagioclase-feldspar	calcite, ankerite	*pyrite, *pyroxene

*Tentative identification due to low concentrations, diffraction line overlap or poor crystalli[illegible]

Instrument:	Siemens D5000 diffractometer
Scan Conditions:	Co radiation, graphite monochromator, 40 kV, 30 mA, Step:0.02°, Step time:1s
Interpretations:	JCPDS / ICDD powder diffraction files. Siemens Search / Match software.
Detection Limit:	0.5-2%. Strongly dependent on crys[illegible]

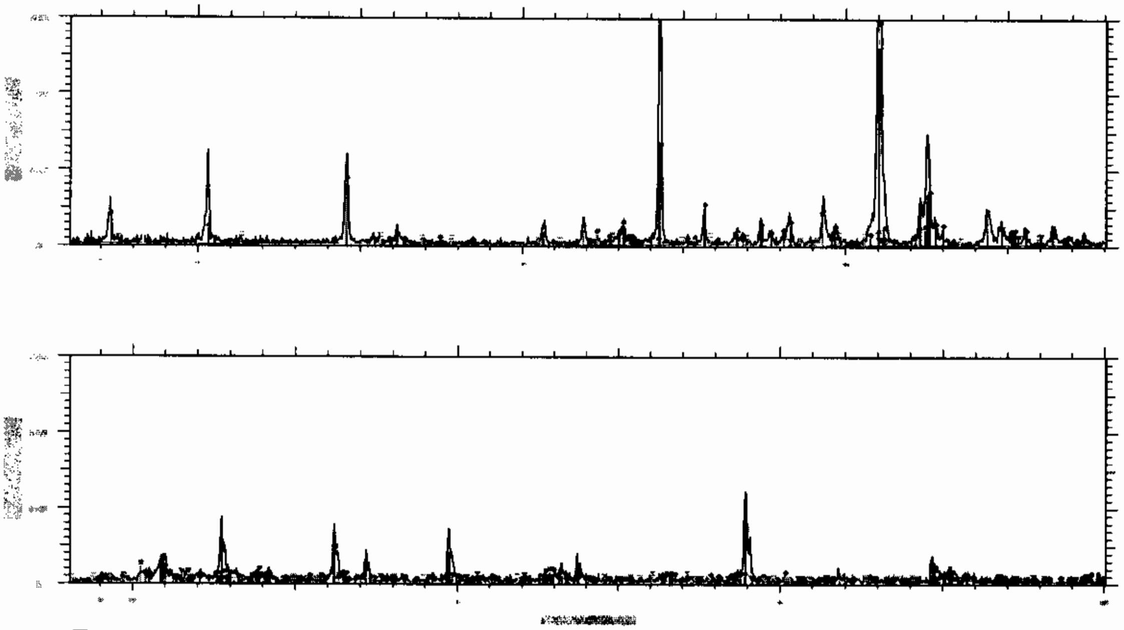
Interpretations do not reflect the presence of non-crystalline / amorphous compounds. Mineral proport[illegible] on relative peak heights and may be strongly influenced by crystallinity, structural group or preferre[illegible]
Interpretations and relative proportions should be accompanied by supporting petrographic and geochemical data (WRA, ICP-OES).

[illegible]	[illegible]
Amphibole	(Na,K)Ca[illegible]
Ankerite	$CaFe(CO_{[illegible]}$
Calcite	$CaCO_{[illegible]}$
Chlorite	(Fe,(Mg,Mn)[illegible]
Mica	K(Mg,Fe)Al[illegible]
Mordenite	(Ca, Na[illegible]
Plagioclase-Feldspar	(NaSi,CaAl)AlSi[illegible]
Pyrite	$FeS_{[illegible]}$
Pyroxene	(Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)[illegible]
Quartz	$SiO_{[illegible]}$
Rectorite	Na-Ca-K-Al-Si-OH·3H[illegible]

[illegible]

Huyun Zhou, Ph.D.
[illegible]

Stephanie Downing, M. Sc.
Project Mineralogist



06-034 - File: Aug5020-1.raw - Type: 2Th/Th locked

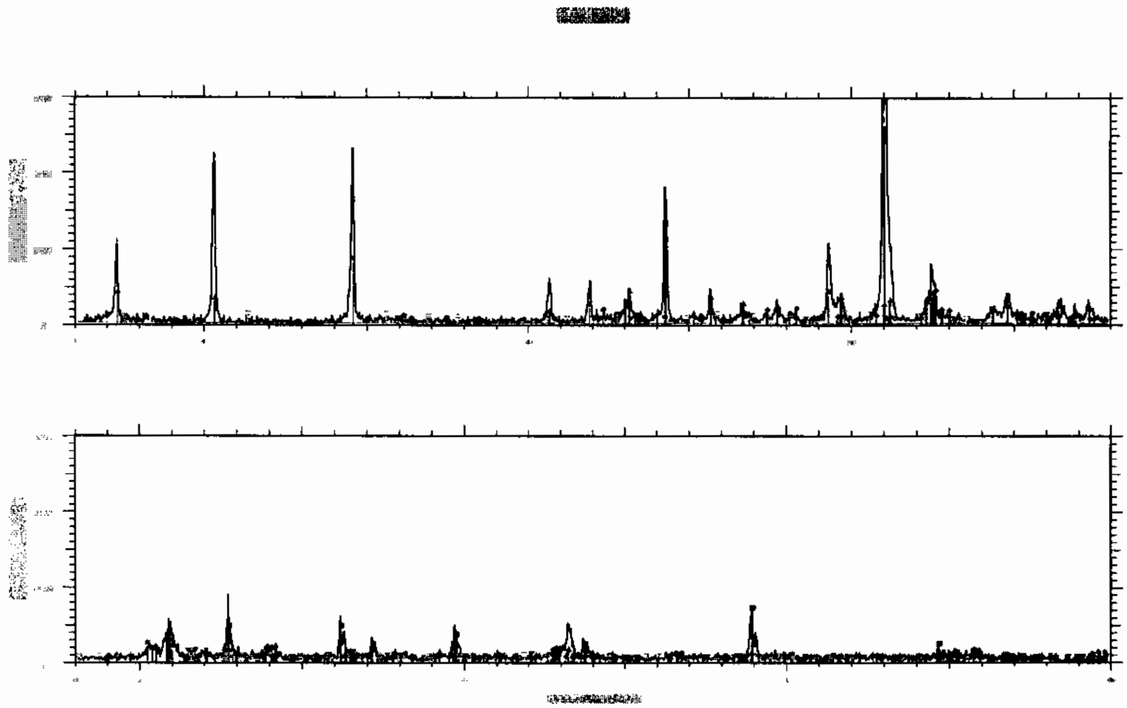
14-0183 (D) - Rectorite - Na-Ca-K-Al-Si-OH·$3H_2O$

65-2163 (C) - Chamosite - $(Mg_{5.036}Fe_{4.964})Al_{2.724}$(S

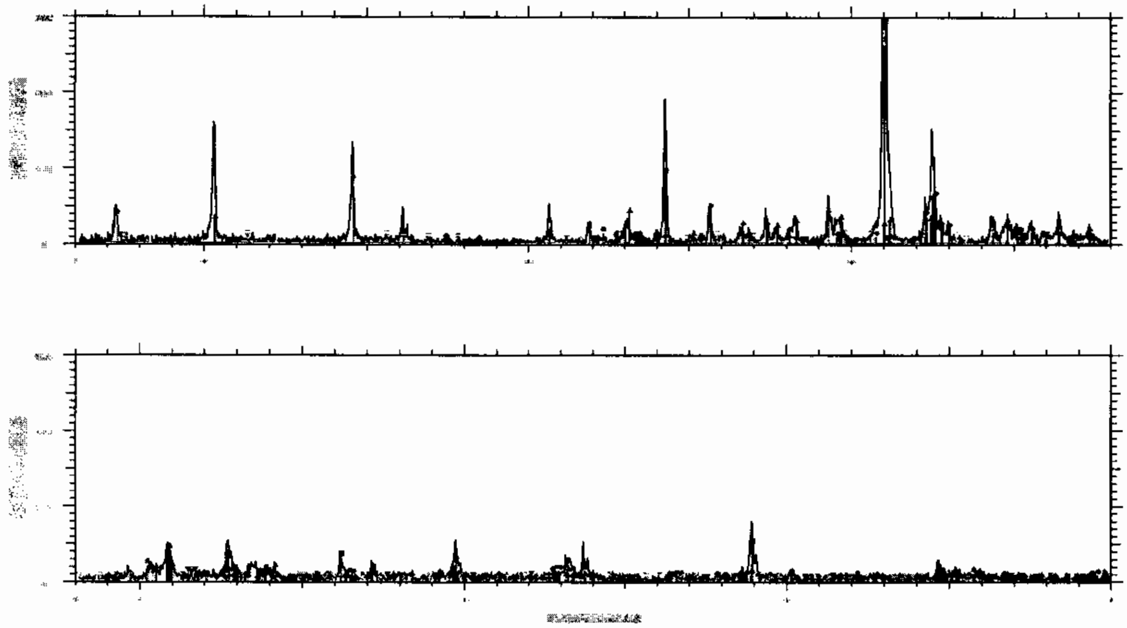
63-0104 (C) - Pyroxene - $(Mg_{0.962}Fe_{0.038})(Ca_{0.999}$Mg

84-1302 (C) - Muscovite - $KAl_3Si_3O_{10}(OH)_2$

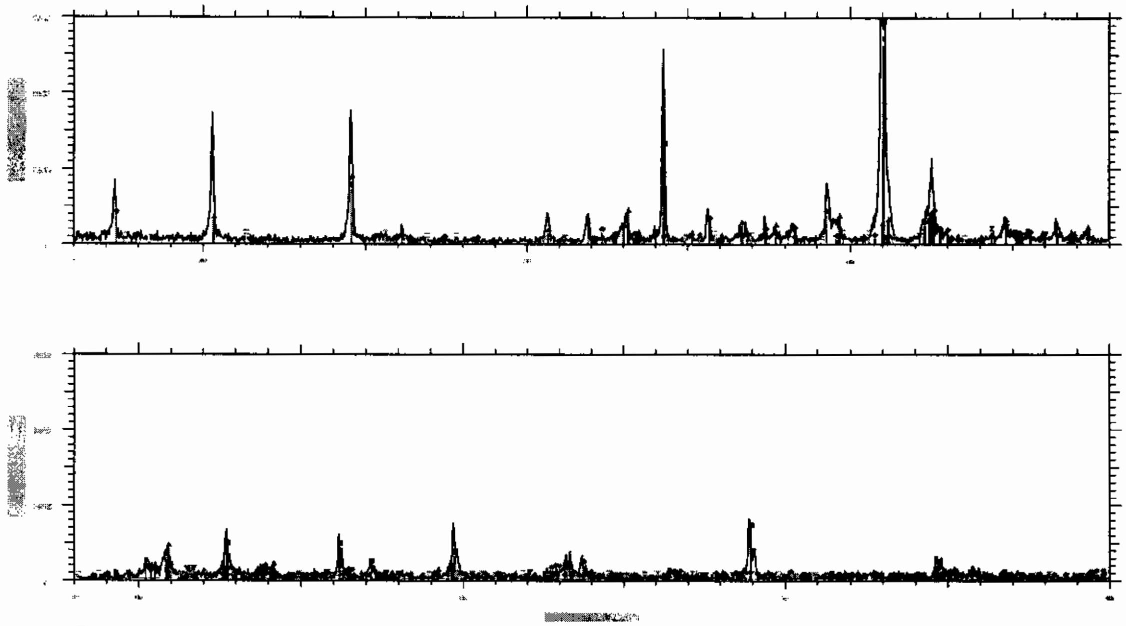
06-0240 (D) - Mordenite - $(Ca,Na_2,K_2)Al_2Si_{10}O_{24}\cdot 7H_2O$



06-049 - File: aug5020-2.raw - Type: 2Th/Th locked [illegible] 14-0183 (D) - Rectorite - Na-Ca-K-Al-Si-OH·3H2O
[illegible]
[illegible]
85-2163 (C) - Chamosite - (Mg5.036Fe4.964)Al2.724(S[illegible]
84-1302 (C) - Muscovite - KAl3Si3O10(OH)2
83-0104 (C) - Pyroxene - (Mg0.962Fe0.038)(Ca0.999Mg[illegible]
[illegible]
06-0240 (D) - Mordenite - (Ca,Na2,K2)Al2Si10O24·7H2O



06-066 - File: Aug5020-3.RAW - Type: 2Th/Th locked [illegible]
[illegible]
[illegible]
85-2163 (C) - Chamosite - (Mg5.036Fe4.964)Al2.724(S[illegible]
84-1302 (C) - Muscovite - KAl3Si3O10(OH)2
83-0104 (C) - Pyroxene - (Mg0.962Fe0.038)(Ca0.999Mg[illegible]
[illegible]
06-0240 (D) - Mordenite - (Ca,Na2,K2)Al2Si10O24·7H2[illegible]
14-0183 (D) - Rectorite - Na-Ca-K-Al-Si-OH·3H2O
71-1060 (C) - Hornblende - Na.9K.4Ca1.6Mg2.9Fe1.4Ti[illegible]



06-070 - File: aug5020-4.raw - Type: 2Th/Th locked

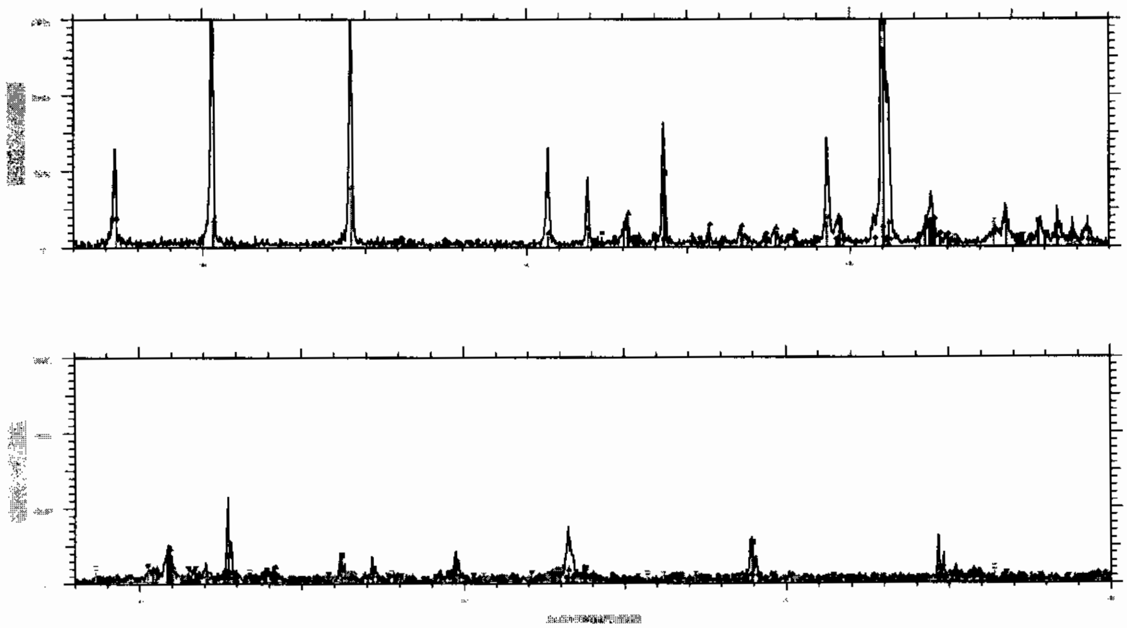
14-0183 (D) - Rectorite - Na-Ca-K-Al-Si-OH·3H2O

85-2163 (C) - Chamosite - (Mg5.036Fe4.964)Al2.724(S

84-1302 (C) - Muscovite - KAl3Si3O10(OH)2

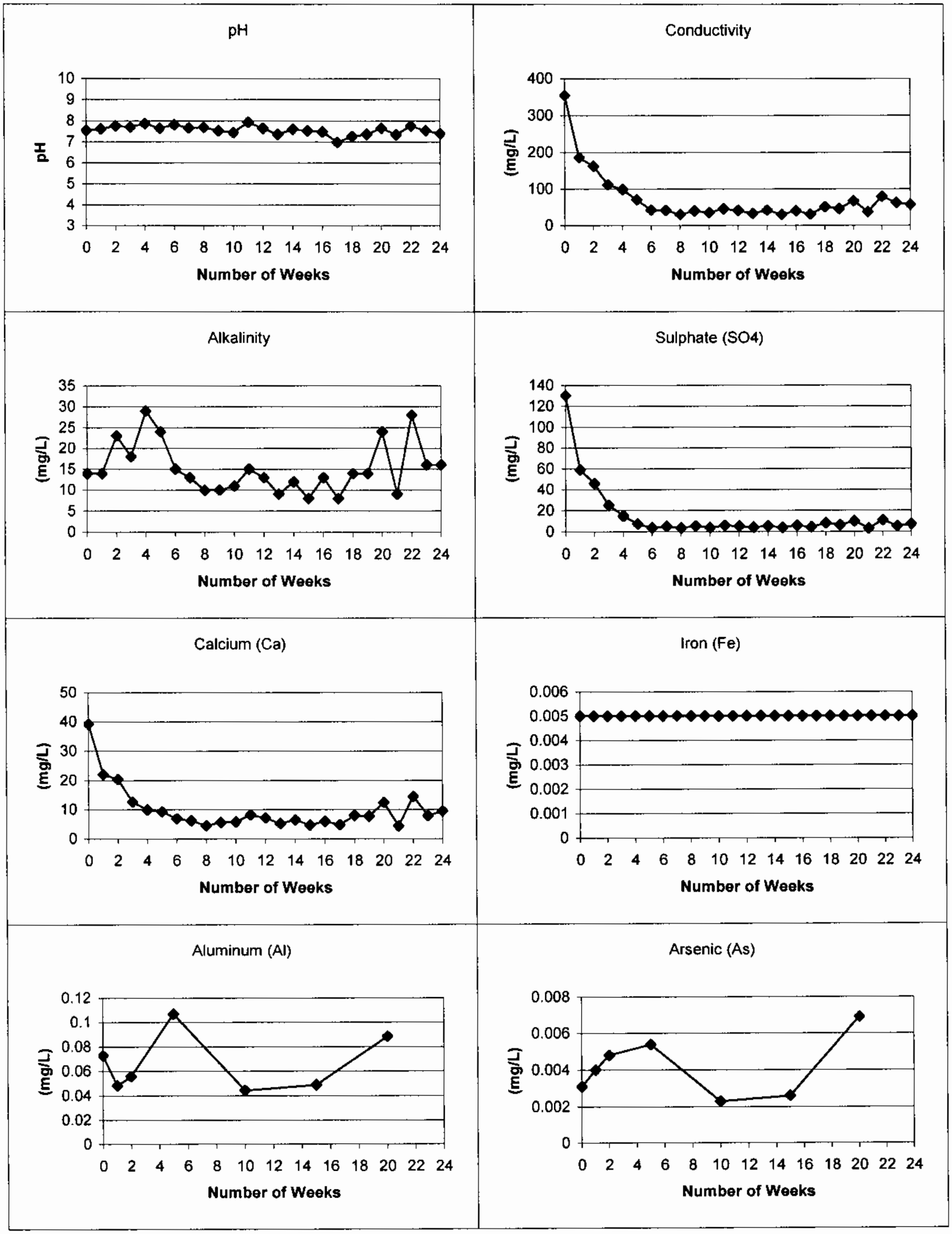
83-0104 (C) - Pyroxene - (Mg0.962Fe0.038)(Ca0.999Mg

06-0240 (D) - Mordenite - (Ca,Na2,K2)Al2Si10O24·7H2



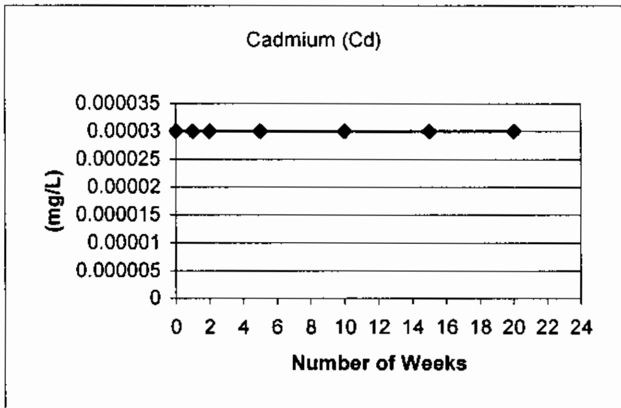
06-073 - File: Aug5020-5.RAW - Type: 2Th/Th locked
85-2163 (C) - Chamosite - (Mg5.036Fe4.964)Al2.724(S
83-0104 (C) - Pyroxene - (Mg0.962Fe0.038)(Ca0.999Mg
84-1302 (C) - Muscovite - KAl3Si3O10(OH)2
79-1347 (C) - Ankerite - Ca.997(Mg.273Fe.676Mn.054)

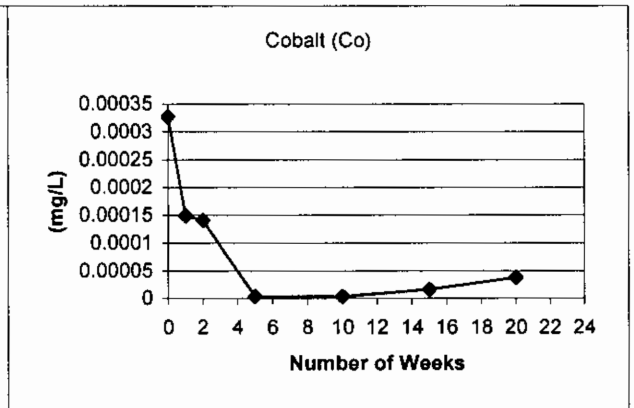
FIGURE 12a
HUMIDITY CELL RESULTS FOR HC 06-051
Composite Material

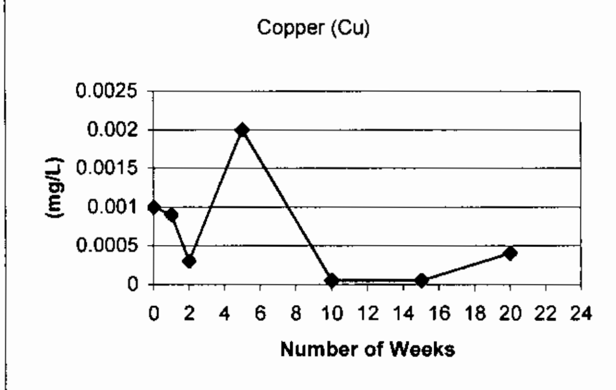


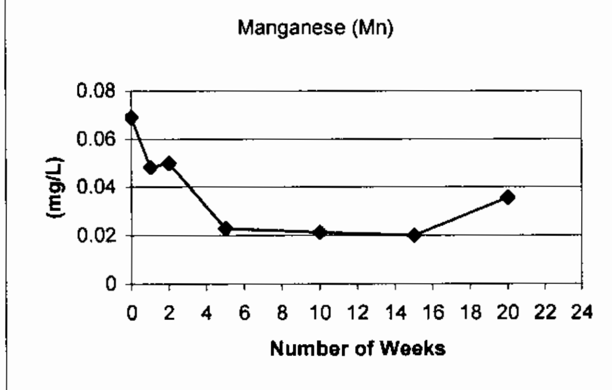
Golder Associates

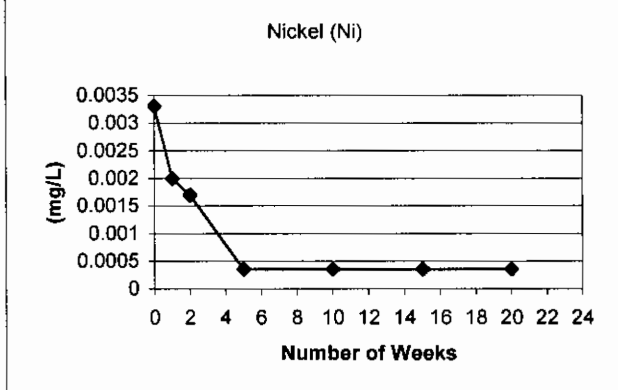
FIGURE 12a
HUMIDITY CELL RESULTS FOR HC 06-051
Composite Material

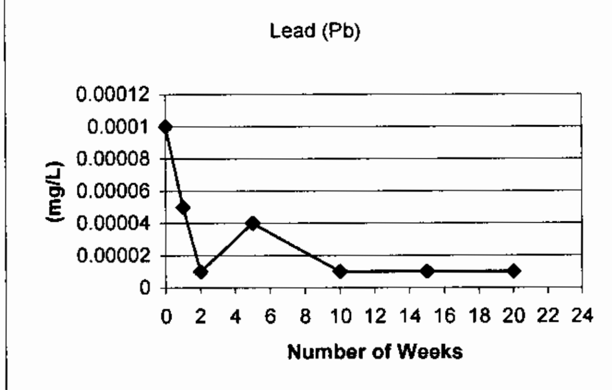












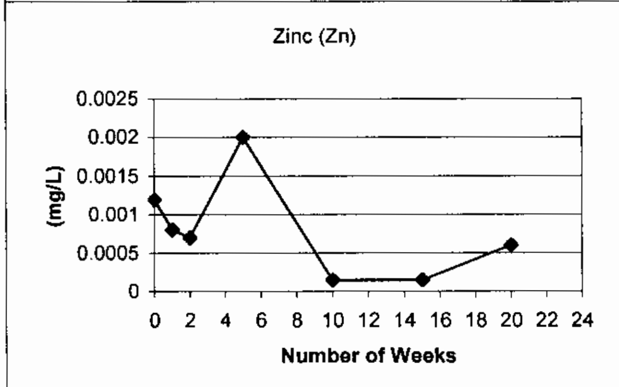


FIGURE 12b
HUMIDITY CELL RESULTS FOR HC 06-070
Composite Sample

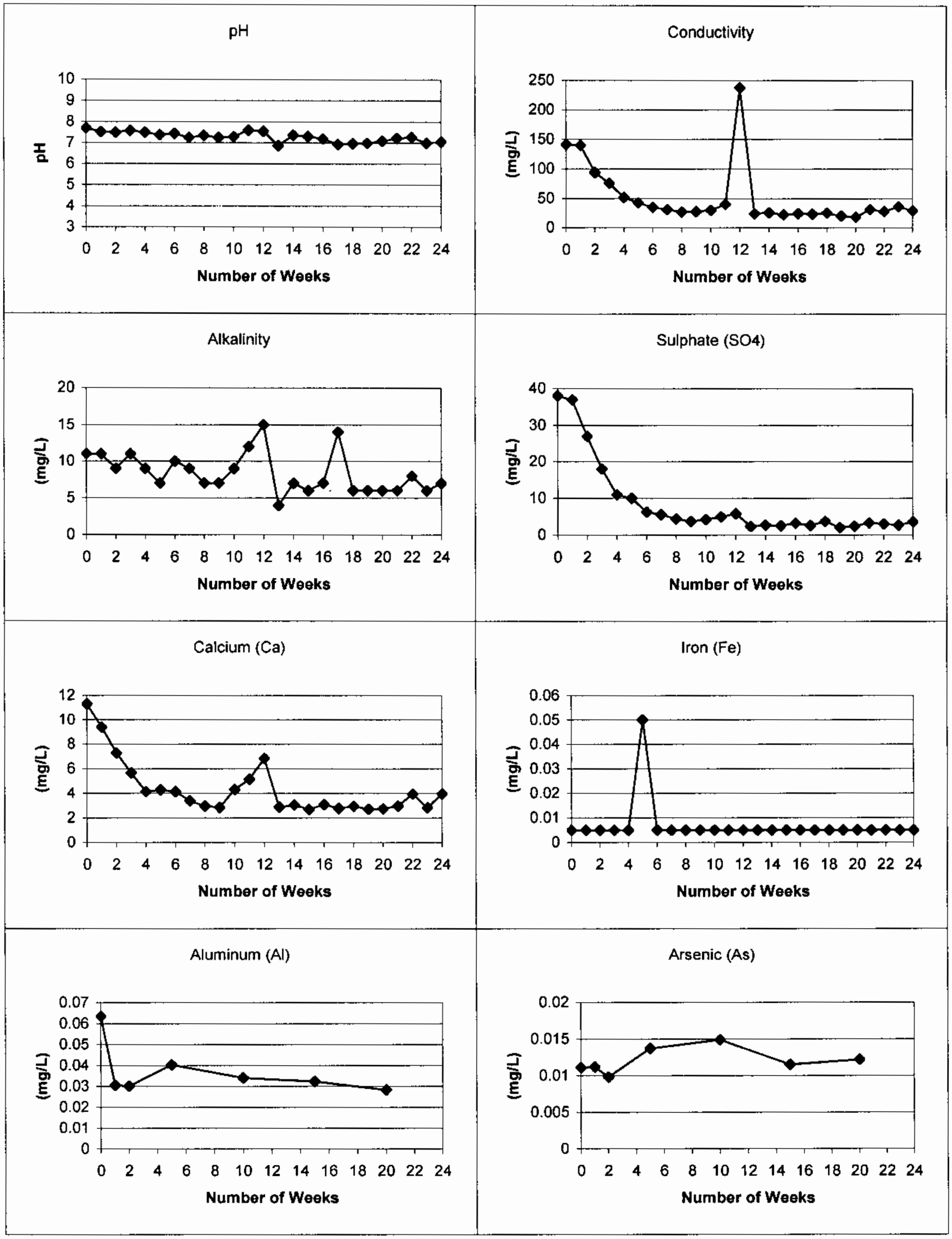


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FIGURE 12b
HUMIDITY CELL RESULTS FOR HC 06-070
Composite Sample

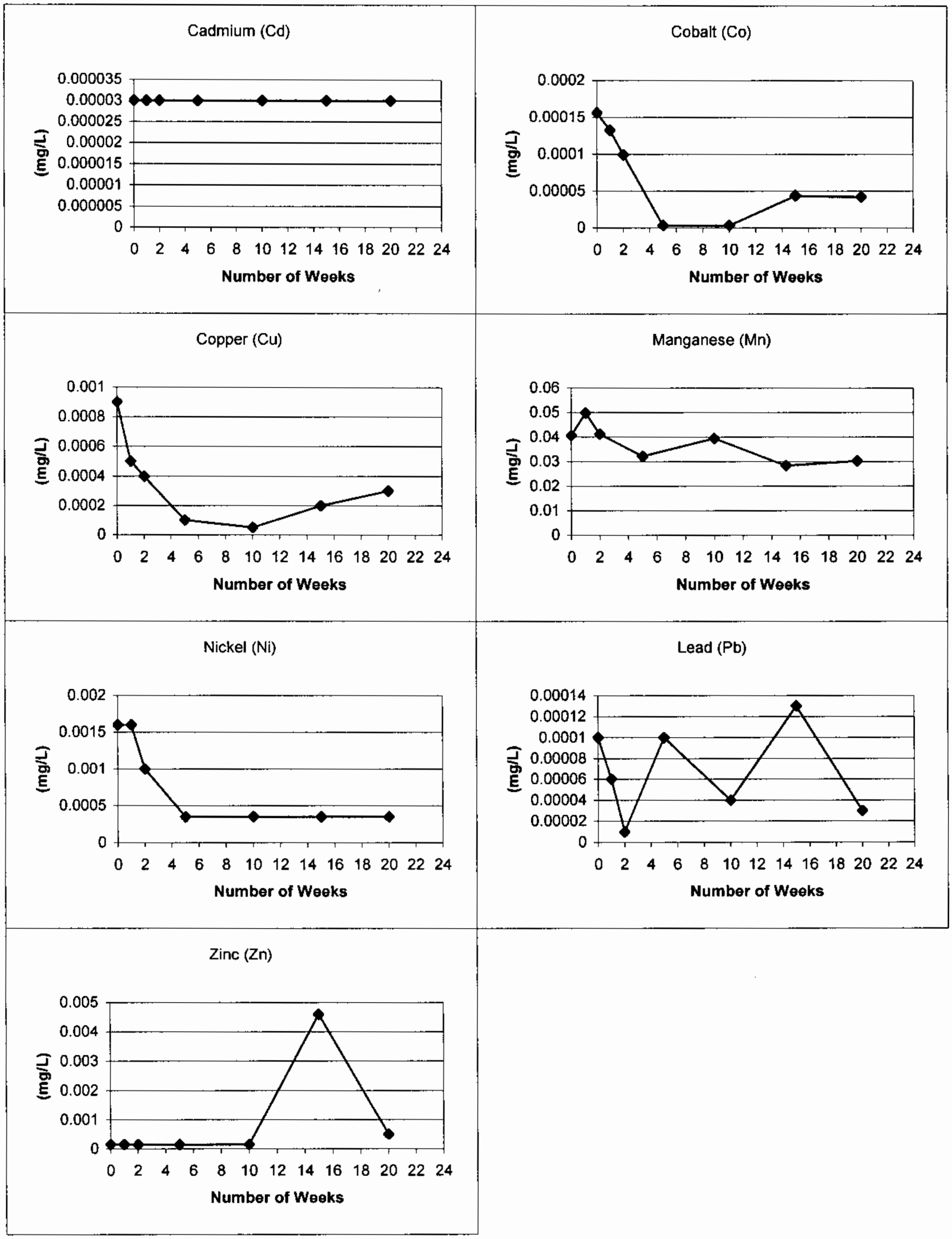

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FIGURE 13
HUMIDITY CELL RESULTS FOR HC 06-085
Marginal Ore

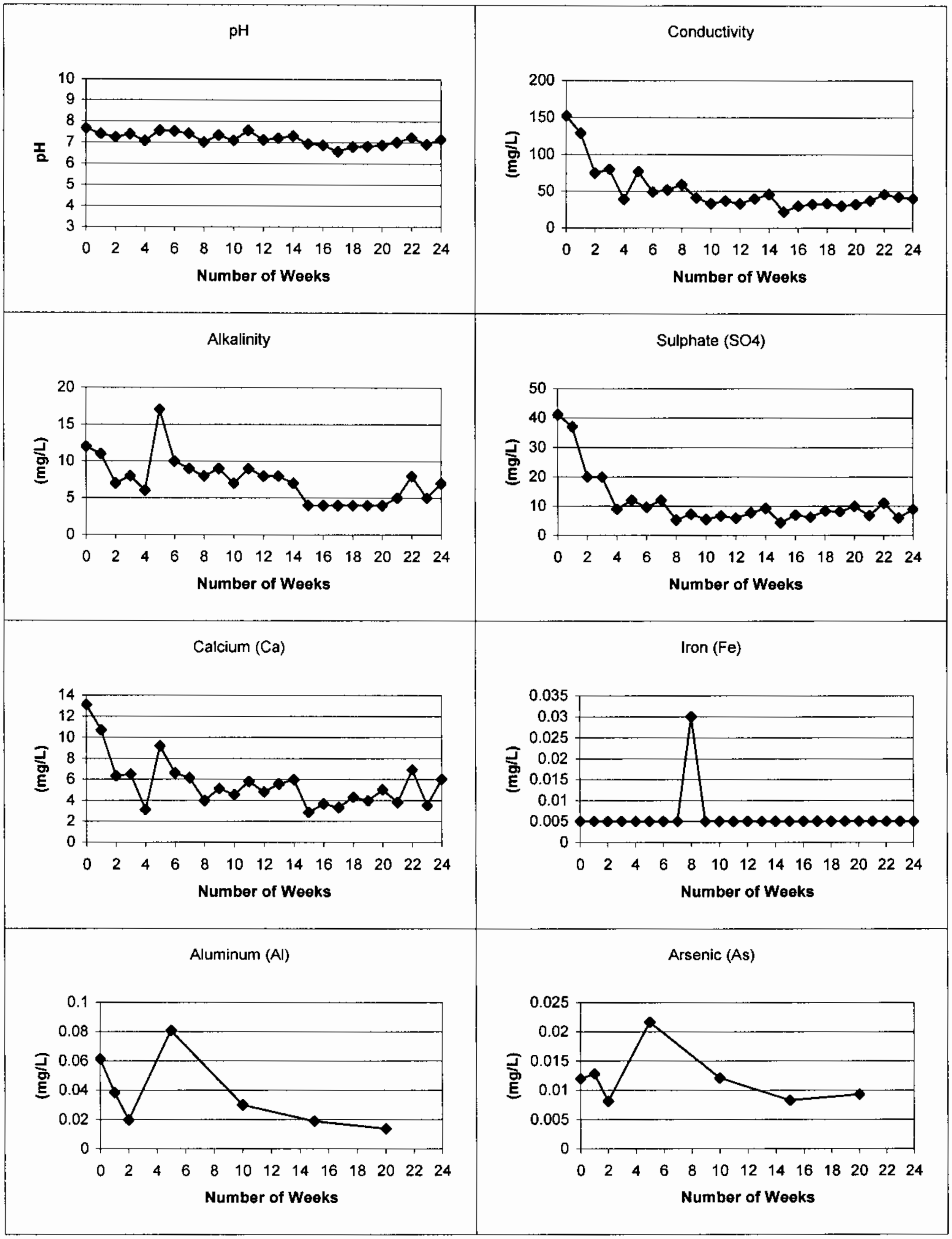

FIGURE 13
HUMIDITY CELL RESULTS FOR HC 06-085
Marginal Ore

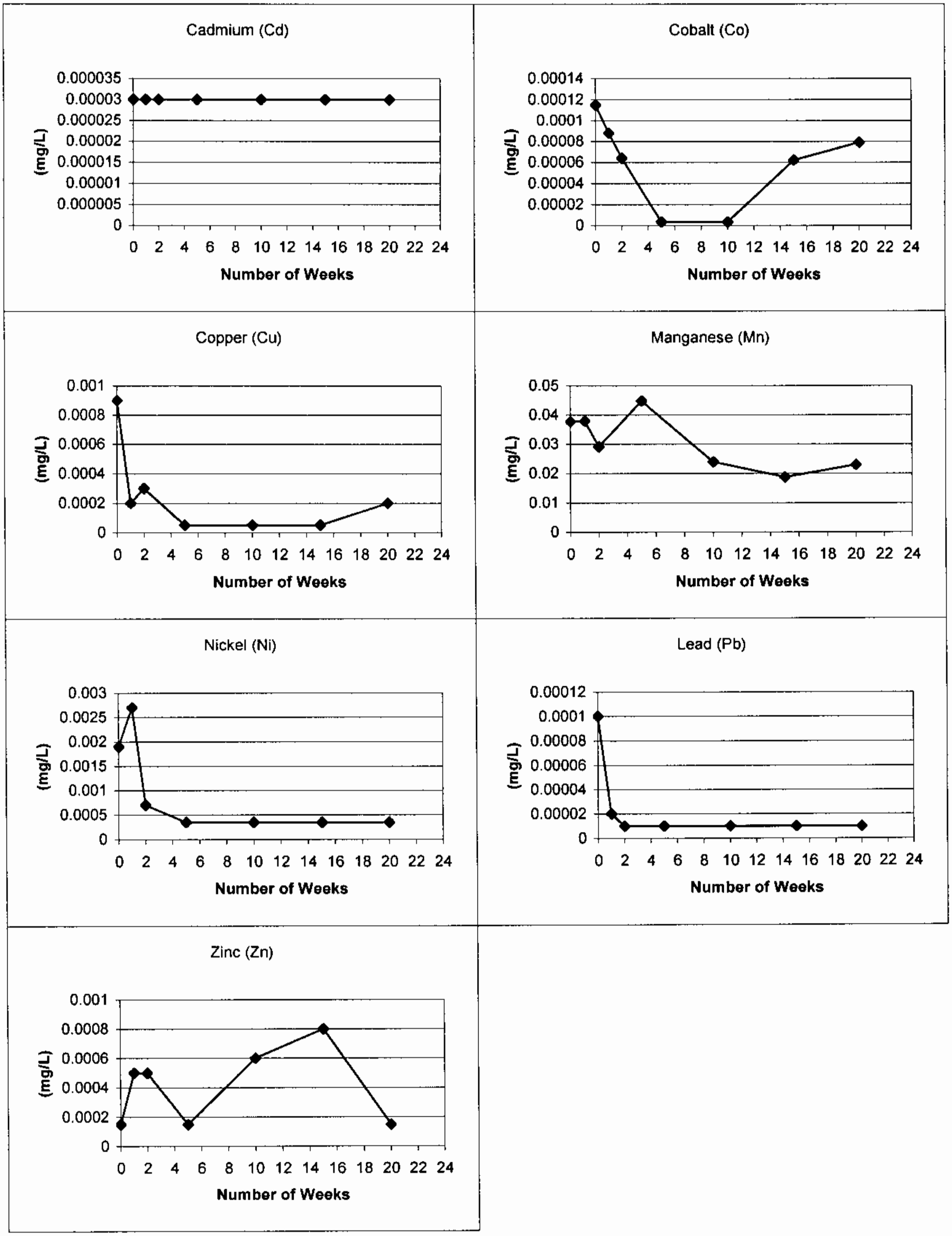

FIGURE 14
HUMIDITY CELL RESULTS FOR CN 1 CND1-7
Tailings Material

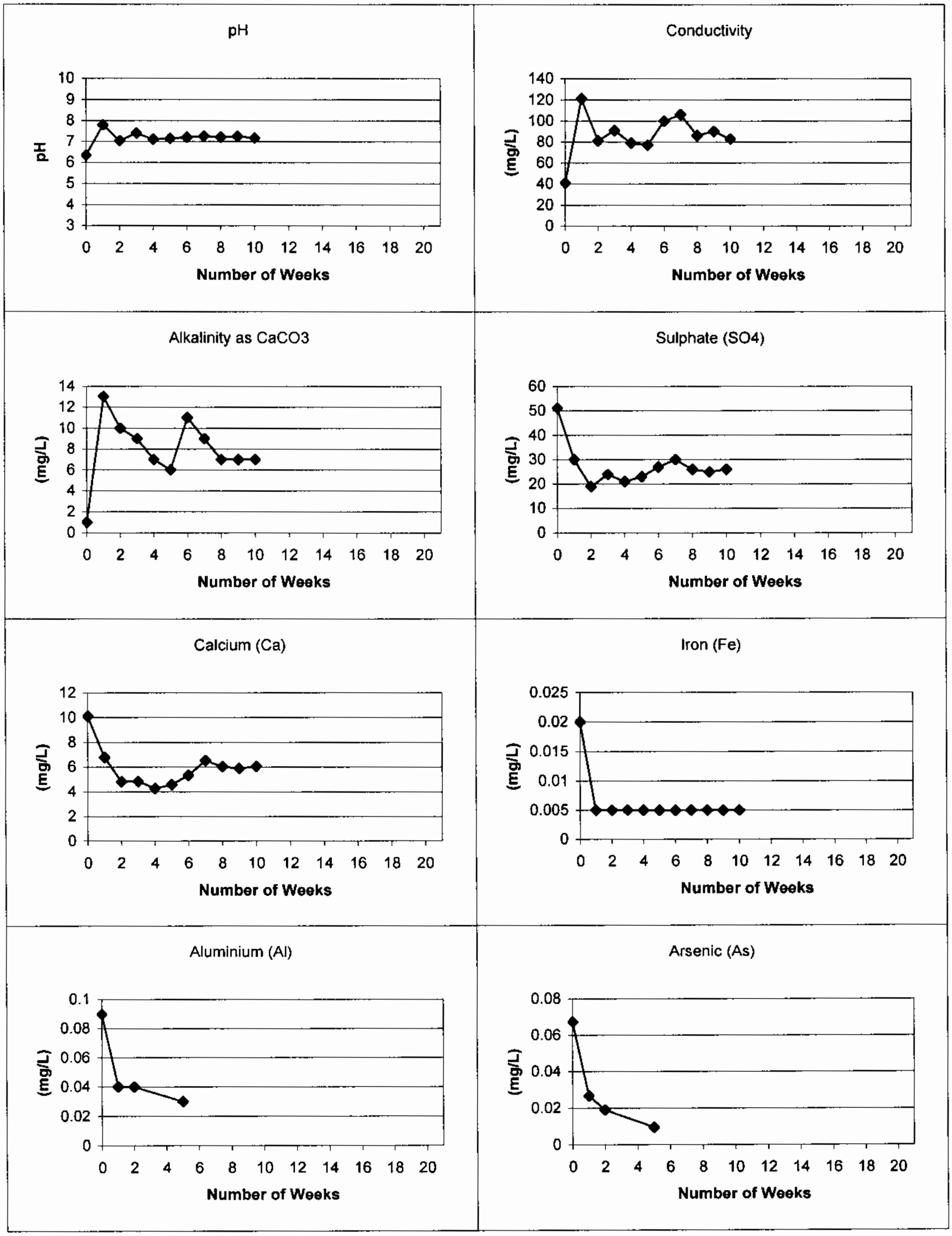

FIGURE 14
HUMIDITY CELL RESULTS FOR CN 1 CND1-7
Tailings Material

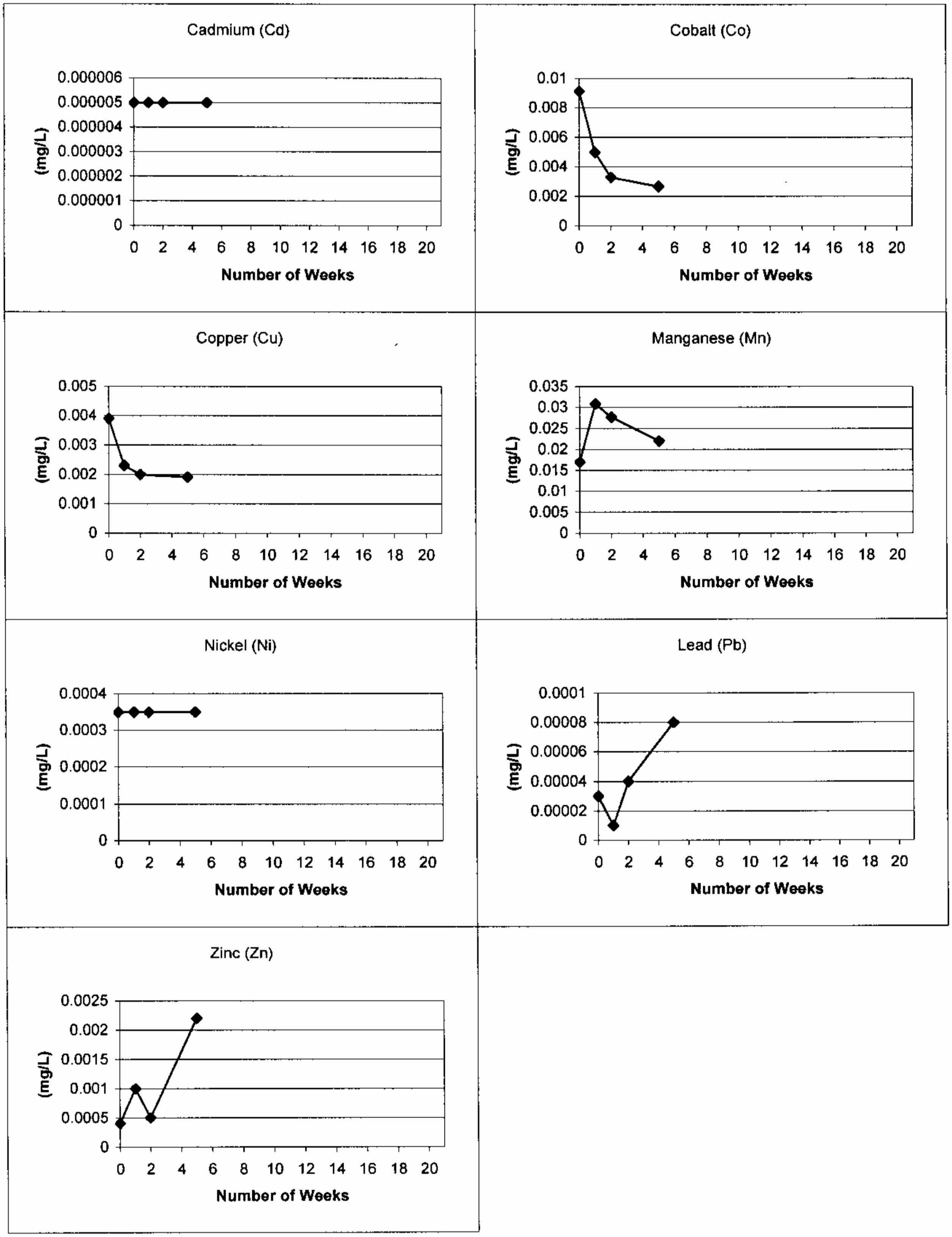

FIGURE 15
HUMIDITY CELL RESULTS FOR CND 2
Tailings Material

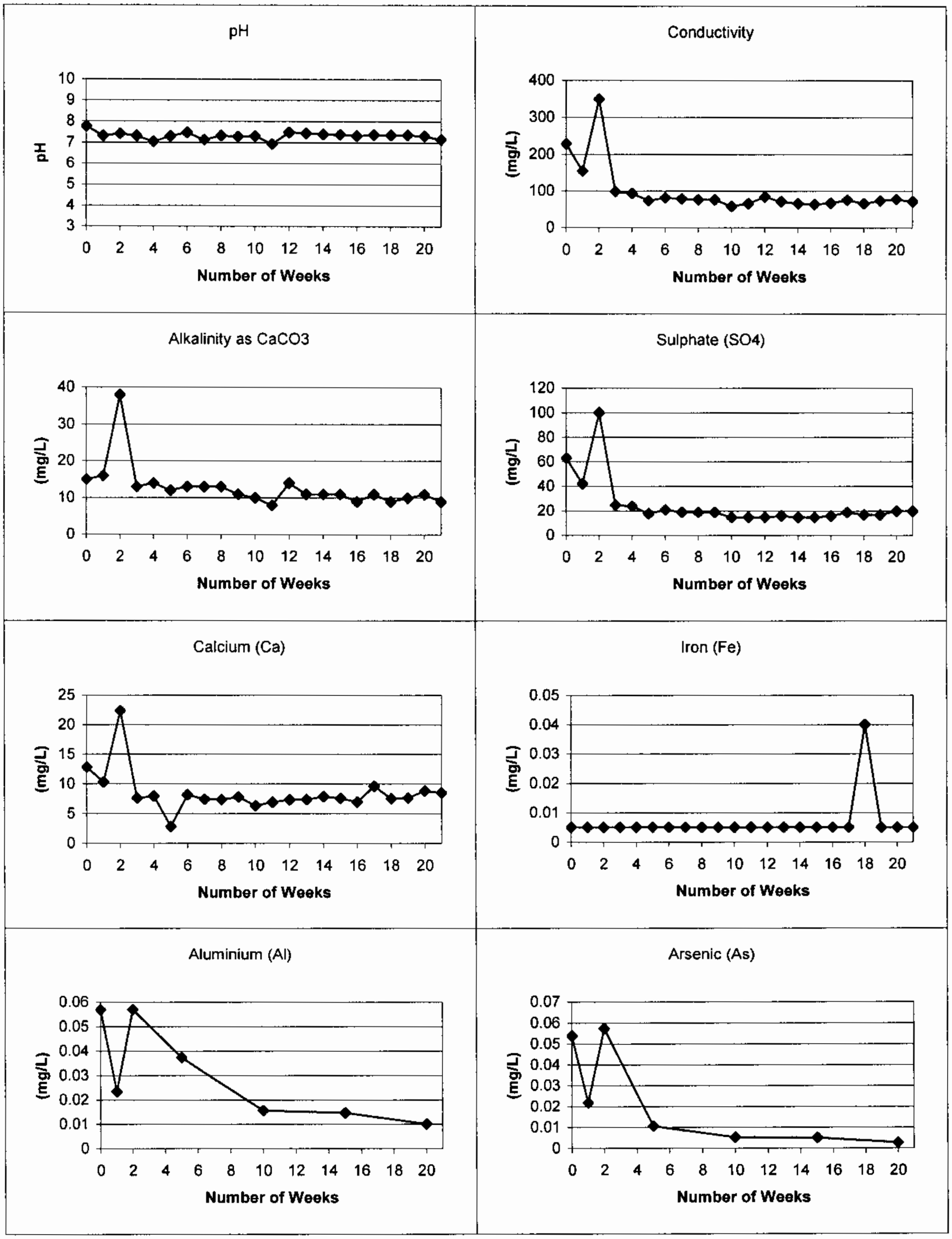

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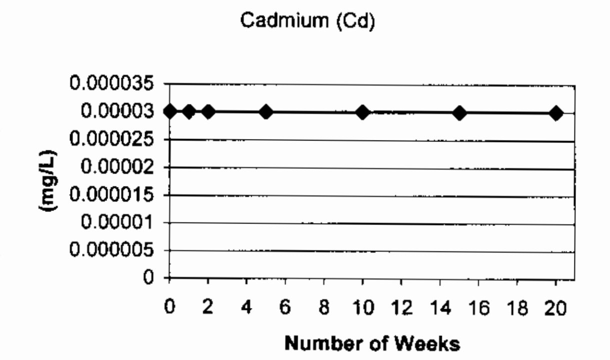
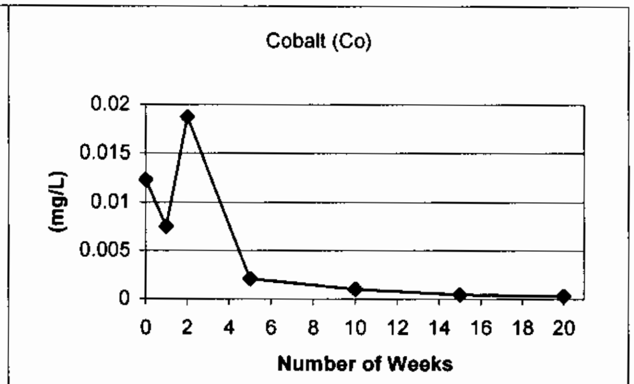
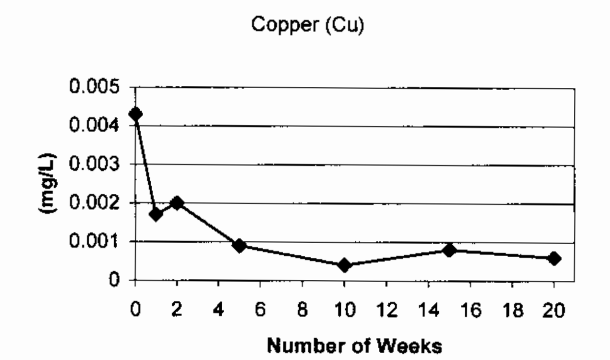
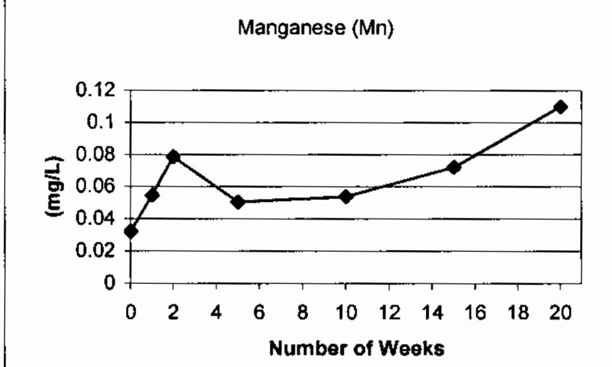
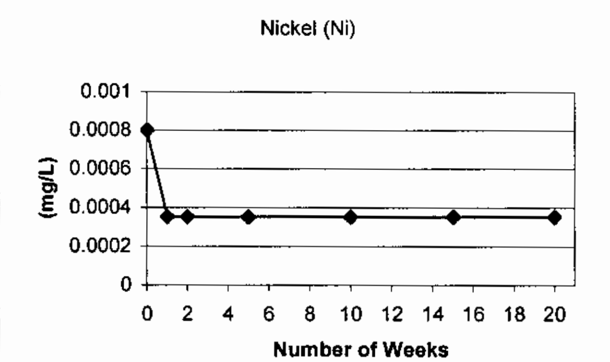
FIGURE 15
HUMIDITY CELL RESULTS FOR CND 2
Tailings Material

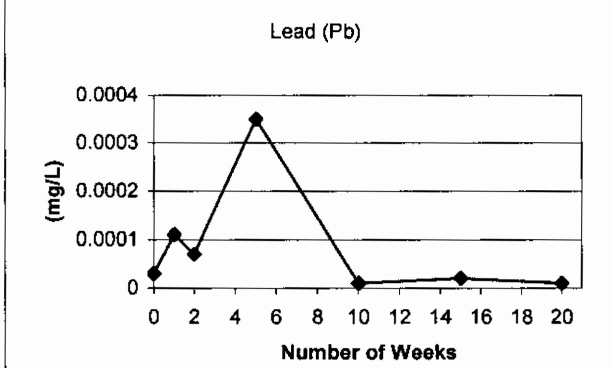












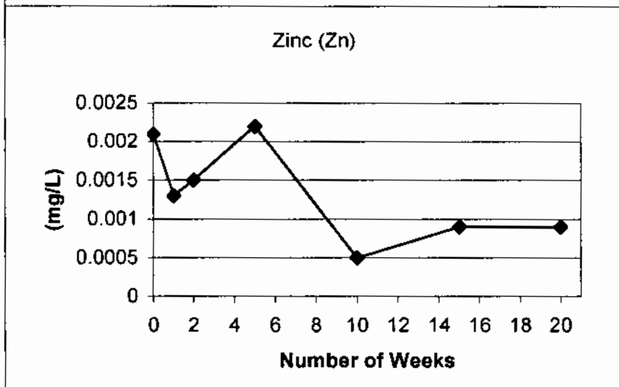
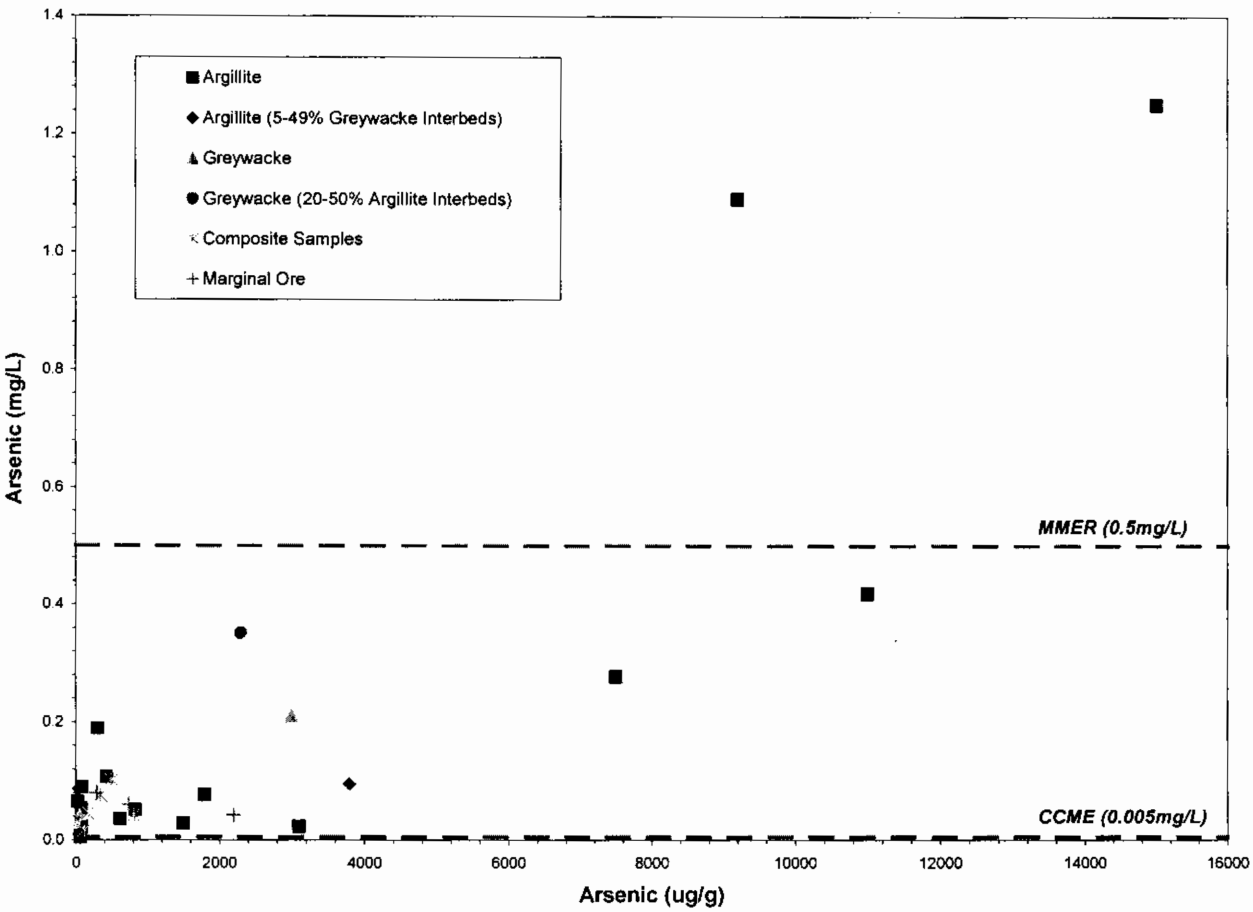


Figure 16.
Dissolved Arsenic Concentrations vs. Solid Arsenic Concentrations



APPENDIX A

STATIC TEST RESULTS

Whole Rock Test Results

Sample	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	V_2O_5	LOI	Sum
#	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
ARGILLITE (5-49%) GREYWACKE														
06-012	58.10	17.40	7.23	2.30	1.72	2.07	3.27	1.06	0.12	0.12	0.01	0.01	4.76	98.20
06-016	63.00	15.20	6.90	1.86	2.43	1.45	2.87	0.81	0.10	0.12	0.01	0.02	4.33	99.10
06-021	57.80	18.00	7.42	2.06	2.57	1.06	3.89	0.89	0.12	0.11	0.01	0.03	5.27	99.20
06-040	57.10	19.50	8.38	2.51	0.87	1.14	4.16	1.01	0.15	0.10	0.02	< 0.01	4.43	99.40
06-042	60.20	16.90	7.77	2.16	1.66	1.70	3.16	0.88	0.12	0.11	< 0.01	0.02	4.26	98.90
06-082	61.60	15.20	7.13	2.35	2.30	1.57	2.94	0.77	0.12	0.14	0.01	< 0.01	4.29	98.40
ARGILLITE (<5% GREYWACKE														
06-004	58.20	16.80	8.21	2.49	1.06	0.87	3.96	0.89	0.12	0.09	< 0.01	0.01	4.44	99.10
06-005	57.90	16.80	9.12	2.62	1.04	0.72	4.06	0.98	0.09	0.09	< 0.01	< 0.01	4.18	99.70
06-006	57.50	18.00	6.67	2.53	1.75	0.80	3.96	0.93	0.10	0.11	< 0.01	0.03	4.37	96.80
06-009	58.90	18.00	7.64	2.40	1.69	0.74	4.18	0.90	0.10	0.10	< 0.01	0.03	4.40	99.00
06-010	55.70	18.80	7.24	2.20	2.77	0.94	4.48	0.93	0.12	0.14	0.01	0.02	5.15	98.50
06-014	55.60	19.40	8.64	2.52	1.39	1.21	4.29	1.00	0.12	0.12	0.01	0.03	4.79	99.10
06-017	57.60	18.30	9.40	2.53	1.07	0.61	3.76	0.89	0.13	0.10	< 0.01	0.02	4.39	99.00
06-019	56.80	18.40	8.46	2.47	1.45	0.57	4.13	0.92	0.10	0.10	< 0.01	0.02	4.73	98.10
06-022	56.90	18.90	9.36	2.64	1.28	0.79	3.86	0.95	0.12	0.11	0.02	0.01	4.42	99.40
06-025	56.20	19.50	8.83	2.46	1.15	0.70	4.26	1.00	0.13	0.11	< 0.01	< 0.01	4.52	98.60
06-028	54.90	20.10	9.21	2.57	0.98	0.32	4.76	1.01	0.10	0.09	0.02	0.03	4.57	98.70
06-029	62.30	16.10	7.10	2.07	1.70	0.53	3.79	0.83	0.09	0.09	0.01	0.02	3.94	98.60
06-030	56.90	18.70	8.86	2.65	1.19	0.59	4.20	0.97	0.11	0.06	0.01	0.02	4.46	98.60
06-031	56.60	18.80	7.53	2.34	2.20	0.79	4.45	0.94	0.11	0.10	0.02	0.03	4.46	98.30
06-032	58.00	18.60	7.94	2.38	1.15	0.67	4.29	0.96	0.12	0.10	0.04	0.01	4.04	98.50
06-033	58.80	17.30	8.11	2.45	1.91	0.98	3.63	0.94	0.12	0.11	0.03	< 0.01	4.36	98.80
06-036	53.40	19.40	8.60	2.83	1.64	0.54	4.92	1.04	0.12	0.12	0.01	0.01	5.10	97.70
06-038	59.00	17.30	7.82	2.46	1.12	0.66	4.12	0.87	0.10	0.10	< 0.01	0.02	4.36	97.90
06-041	55.80	19.70	9.17	2.74	0.93	0.94	4.11	0.97	0.13	0.10	< 0.01	0.02	4.61	99.20
06-043	58.00	18.40	7.98	2.51	1.33	0.96	3.78	0.89	0.12	0.11	< 0.01	0.03	4.55	98.70
06-044	56.50	19.10	8.14	2.47	1.06	0.76	4.43	0.93	0.13	0.11	< 0.01	0.02	4.62	98.30
06-046	58.20	19.00	7.88	2.53	1.02	0.84	4.30	0.92	0.11	0.10	< 0.01	< 0.01	4.30	99.20
06-047	58.40	18.40	8.04	2.47	1.36	0.74	4.03	0.92	0.11	0.11	< 0.01	< 0.01	4.43	99.00
06-048	57.90	18.00	7.77	2.43	1.97	0.86	4.00	0.91	0.11	0.11	< 0.01	0.02	4.75	98.80
06-049	58.30	18.00	7.93	2.51	1.52	0.79	4.03	0.86	0.11	0.12	< 0.01	0.02	4.24	98.40
06-050	57.40	18.20	8.30	2.44	1.77	0.87	4.01	0.97	0.11	0.12	< 0.01	0.01	4.44	98.70
06-053	57.00	18.60	8.58	2.37	1.60	1.16	3.99	0.94	0.10	0.11	< 0.01	0.02	4.21	98.90
06-054	56.90	16.90	8.11	2.67	2.10	1.58	3.10	0.94	0.11	0.15	0.01	< 0.01	4.68	99.30
06-067	62.60	16.10	7.32	2.09	0.31	0.16	3.73	0.74	0.12	0.06	< 0.01	0.01	3.80	97.30
06-071	59.20	16.60	8.20	2.72	1.61	0.11	4.08	0.89	0.13	0.15	0.02	< 0.01	4.37	98.10
06-073	54.80	18.30	8.46	2.75	2.17	0.87	4.42	0.93	0.11	0.13	< 0.01	< 0.01	4.77	97.70
06-074	56.20	18.80	8.56	2.45	1.56	0.84	4.43	0.99	0.11	0.11	< 0.01	0.02	4.18	98.20
06-076	63.00	16.20	7.64	2.24	0.30	0.15	3.99	0.86	0.10	0.07	< 0.01	0.01	3.68	98.30
06-077	56.90	19.00	8.72	2.48	1.03	0.63	4.53	0.95	0.11	0.09	0.01	0.03	3.94	98.30
06-078	58.70	18.20	7.89	2.27	1.70	1.06	4.12	0.97	0.12	0.10	< 0.01	< 0.01	3.94	99.10
06-079	56.00	17.70	8.49	3.21	1.18	0.68	4.36	0.90	0.10	0.09	0.02	< 0.01	4.93	97.70
06-080	55.70	17.80	8.05	3.17	0.85	0.51	4.58	0.87	0.09	0.09	0.01	0.02	5.37	97.10
06-083	52.50	19.60	8.99	3.32	1.11	0.57	5.06	0.98	0.09	0.11	0.02	0.02	5.65	98.00
06-084	56.60	19.00	8.75	2.51	1.01	0.86	4.40	0.97	0.11	0.10	< 0.01	< 0.01	3.92	98.30
COMPOSITE														
06-007	56.90	17.90	7.26	2.25	2.93	1.20	3.78	0.91	0.11	0.12	0.01	0.01	5.07	98.40
06-018	58.60	17.20	7.47	2.02	2.81	1.21	3.45	0.94	0.12	0.12	< 0.01	0.02	5.05	99.00
06-023	59.20	16.70	8.17	2.36	2.16	1.00	3.43	0.90	0.12	0.13	< 0.01	< 0.01	4.76	98.90
06-027	59.50	17.40	7.60	2.27	1.74	1.23	3.51	0.95	0.13	0.10	< 0.01	0.01	4.39	98.90
06-035	59.20	16.80	6.20	1.92	3.24	1.56	3.26	0.90	0.10	0.12	0.03	0.03	4.94	98.30
06-045	58.40	18.30	7.54	2.30	1.65	1.28	3.83	0.96	0.11	0.10	< 0.01	0.01	4.45	98.90
06-051	58.00	18.10	7.96	2.46	1.71	1.53	3.57	1.00	0.12	0.12	< 0.01	< 0.01	4.29	98.90
06-052	62.00	17.20	7.13	2.21	1.51	1.73	3.35	0.90	0.12	0.10	< 0.01	0.03	3.71	100.00
06-055	60.30	18.30	7.37	2.17	0.50	1.44	3.97	0.95	0.11	0.11	< 0.01	< 0.01	3.69	98.90
06-058	61.80	17.30	6.72	2.04	1.30	1.76	3.66	0.99	0.10	0.09	< 0.01	0.03	3.88	99.70
06-059	58.00	14.40	5.08	1.93	8.68	2.32	2.57	0.72	0.16	0.21	0.02	< 0.01	7.29	99.40
06-062	60.60	18.20	7.47	2.27	0.74	1.50	3.80	0.97	0.12	0.09	< 0.01	0.01	3.86	99.60
06-064	59.10	17.90	7.66	2.29	1.35	1.64	3.69	0.99	0.10	0.13	0.03	0.02	3.98	98.90
06-069	60.40	15.90	6.69	2.01	3.20	1.50	3.19	0.91	0.13	0.15	< 0.01	0.01	5.02	99.10
06-070	65.10	14.60	6.13	1.91	1.40	1.84	2.91	0.79	0.09	0.12	< 0.01	0.01	3.62	98.80
GREYWACKE (20%-50% ARGILLITE INTERBEDS														
06-001	60.30	16.80	7.34	2.14	1.55	1.67	3.40	0.90	0.10	0.11	0.02	0.03	4.07	98.40
06-002	55.50	19.60	9.06	2.57	1.18	0.87	4.23	0.99	0.11	0.11	< 0.01	0.01	4.61	98.80
06-003	59.90	17.10	7.40	2.07	1.84	1.41	3.53	0.93	0.12	0.13	0.01	0.02	4.55	99.00
06-011	63.40	15.50	6.22	1.86	1.66	2.15	2.89	0.96	0.14	0.12	< 0.01	0.03	4.00	98.90
06-013	70.80	11.70	3.65	0.95	2.55	2.77	1.68	0.78	0.10	0.09	0.01	< 0.01	3.44	98.80
06-015	68.40	12.90	4.97	1.56	1.54	2.46	2.04	0.77	0.09	0.12	0.02	< 0.01	3.41	98.40
06-020	64.90	13.40	6.22	1.56	3.33	1.56	2.33	0.74	0.09	0.15	< 0.01	0.02	4.65	99.00
06-024	66.20	14.60	5.83	1.59	2.05	2.07	2.51	0.76	0.10	0.09	0.01	0.02	3.63	99.50
06-026	60.80	17.20	6.80	1.89	1.80	1.31	3.56	0.98	0.14	0.09	< 0.01	0.02	4.22	98.80
06-034	66.50	13.10	5.04	1.62	2.92	2.33	2.16	0.84	0.09	0.10	0.01	0.01	3.69	98.40
06-039	60.60	16.80	6.42	2.22	1.94	2.28	3.28	0.91	0.12	0.10	< 0.01	0.02	3.67	98.60
06-057	64.00	14.40	4.93	1.40	3.69	2.32	2.68	0.86	0.08	0.15	0.01	0.01	4.92	99.70
GREYWACKE (<20% ARGILLITE INTERBEDS														
06-056	66.50	12.60	3.95	1.11	4.08	2.59	2.02	0.71	0.07	0.13	< 0.01	0.02	4.51	100.30
06-060	66.60	12.40	4.53	1.65	3.59	2.83	1.56	0.64	0.14	0.11	< 0.01	< 0.01	4.39	98.70
06-061	70.70	11.60	3.94	1.45	2.13	3.14	1.31	0.60	0.14	0.11	< 0.01	0.02	3.16	96.30
06-063	68.60	12.90	3.87	1.08	2.86	2.52	2.18	0.75	0.08	0.10	< 0.01	< 0.01	3.85	98.80
06-065	63.10	14.40	5.44	1.64	2.76	1.99	2.51	0.89	0.13	0.12	< 0.01	0.02	4.21	97.20
06-066	64.70	15.30	5.26	1.79	1.80	2.68	2.91	0.87	0.12	0.10	0.01	0.01	3.45	99.00
06-068	68.10	13.80	4.46	1.28	1.98	2.51	2.36	0.84	0.07	0.08	0.01	0.01	3.38	98.90
06-072	71.00	12.70	4.54	1.84	1.30	3.14	1.56	0.58	0.14	0.09	0.01	0.01	2.65	99.80
06-075	67.20	14.10	5.88	2.33	1.57	< 0.05	3.38	0.69	0.15	0.10	0.02	0.01	4.07	99.60
06-081	69.50	13.10	4.83	1.42	1.21	2.70	1.79	0.81	0.10	0.08	< 0.01	0.01	2.63	98.20
MARGINAL ORE														
06-008	56.80	18.70	7.32	2.34	1.98	0.67	4.51	0.91	0.12	0.10	0.01	0.02	4.58	98.10
06-085	58.20	18.30	7.70	2.34	1.54	0.51	4.43	0.89	0.09	0.10	0.02	0.01	4.07	98.20
06-086	58.00	18.00	7.94	2.32	1.78	0.76	4.15	0.87	0.10	0.10	0.01	0.03	4.16	98.20
06-087	56.70	18.10	8.24	2.41	1.85	0.67	4.28	0.91	0.13	0.11	< 0.01	0.02	4.15	97.70
06-088	55.80	18.00	9.06	2.53	2.24	0.48	4.13	0.92	0.10	0.11	< 0.01	0.02	4.42	97.60
06-089	59.50	17.30	7.63	2.31	1.61	0.98	3.99	0.91	0.11	0.10	< 0.01	< 0.01	3.92	98.30
06-090	60.50	17.70	7.24	2.37	1.77	0.99	3.86	0.88	0.12	0.09	< 0.01	0.02	4.22	99.80
06-091	60.40	17.40	8.27	2.72	0.68	0.77	3.64	0.89	0.13	0.08	< 0.01	< 0.01	3.87	98.80
06-092	57.10	18.70	8.26	2.61	1.19	0.71	4.15	0.91	0.11	0.10	0.01	0.03	4.35	98.20
06-093	58.90	18.00	8.31	2.85	0.92	0.18	4.43	0.88	0.11	0.11	0.01	0.01	4.41	99.00
06-094	65.30	15.70	5.41	1.46	1.58	1.94	3.14	0.80	0.10	0.09	0.03	< 0.01	3.58	99.10
QUARTZ VEIN														
06-037	92.00	0.53	1.46	0.13	1.44	< 0.05	0.12	0.02	0.02	0.05	< 0.01	< 0.01	1.23	97.00
TAILINGS														
Cnd 2 Treated Solids	56.90	19.70	7.70	2.60	1.16	0.57	4.80	0.54	0.11	0.08	0.03	0.02	4.47	98.70

Sample #	Ag (µg/g)	Al (µg/g)	As (µg/g)	Ba (µg/g)	Be (µg/g)	Bi (µg/g)	Ca (µg/g)	Cd (µg/g)	Co (µg/g)	Cr (µg/g)	Cu (µg/g)	Fe (µg/g)	K (µg/g)	Li (µg/g)	Mg (µg/g)	Mn (µg/g)	Mo (µg/g)	Na (µg/g)	Ni (µg/g)	Pb (µg/g)	Sb (µg/g)	Se (µg/g)	Sn (µg/g)	Sr (µg/g)	Ti (µg/g)	Tl (µg/g)	U (µg/g)	V (µg/g)	Y (µg/g)	Zn (µg/g)	Hg (µg/g)
ARGILLITE (5-40%) GREYWACKE																															
08-012	0.13	78000	150	550	2.0	0.17	13000	0.08	17	81	27	49000	29000	31	14000	970	1.80	15000	26	9.3	0.2	<2	2.7	130	1600	0.7	1.8	130	7.4	110	<0.1
08-018	0.19	88000	42	500	1.8	0.35	18000	0.04	16	54	74	48000	25000	30	11000	1100	3.00	11000	34	28.0	0.3	<2	1.9	120	1400	0.6	1.5	110	8.7	100	<0.1
08-021	0.19	99000	53	690	2.3	0.38	19000	0.09	14	85	57	55000	37000	34	15000	850	1.70	22000	29	44.0	<0.1	<2	1.9	140	1200	0.9	1.5	120	9.5	100	<0.1
08-040	0.78	81000	340	750	2.6	0.49	8500	0.05	19	81	63	81000	39000	43	18000	820	2.60	28000	31	21.0	<0.1	<2	2.5	100	1900	0.7	1.7	140	6.3	150	<0.1
08-042	0.38	100000	35	510	1.7	0.28	11000	0.31	15	54	95	80000	31000	31	17000	880	2.80	37000	31	16.0	<0.1	<2	1.8	120	2100	2.9	1.5	100	7.0	95	<0.1
08-082	0.23	69000	3600	380	1.4	0.72	14000	0.16	15	81	40	50000	22000	26	12000	1000	1.90	12000	36	16.0	2.3	3	2.1	98	1000	0.4	1.4	81	6.7	98	<0.1
ARGILLITE (<5% GREYWACKE																															
08-004	0.29	72000	160	830	2.1	0.14	8700	0.08	16	89	42	56000	35000	35	15000	710	0.97	7400	34	12.0	0.4	7	3.0	82	3100	0.7	1.7	110	4.3	120	<0.1
08-005	0.15	85000	120	590	2.0	0.10	8100	0.05	18	59	58	82000	35000	36	15000	730	1.10	5300	38	10.0	0.4	<2	2.8	53	2700	0.7	1.6	120	5.1	120	<0.1
08-008	0.20	70000	380	590	1.9	0.16	11000	0.12	16	62	51	60000	34000	34	15000	670	0.73	6100	34	7.9	0.4	<2	2.8	75	3200	0.7	1.5	110	6.6	110	<0.1
08-009	0.23	73000	830	630	2.1	0.56	11000	0.10	21	65	42	54000	38000	32	14000	770	0.92	5800	32	15.0	0.5	<2	2.9	87	1600	0.7	1.6	110	8.5	100	<0.1
08-010	0.34	84000	380	710	2.2	0.43	20000	0.28	14	80	40	50000	39000	31	14000	1000	1.10	6800	27	13.0	1.3	<2	3.2	86	2300	0.9	1.7	130	9.4	120	<0.1
08-014	0.23	93000	130	760	2.5	0.33	10000	0.17	16	59	52	60000	38000	37	17000	990	1.20	9200	35	11.0	0.4	<2	3.0	110	2500	0.9	1.6	140	8.8	130	<0.1
08-017	0.43	79000	48	810	2.0	0.23	7300	0.03	18	63	45	67000	34000	42	16000	830	0.69	4700	35	4.3	0.2	<2	2.4	88	1200	0.7	1.6	120	8.7	120	<0.1
08-019	0.22	91000	110	660	2.2	0.53	10000	0.08	18	59	91	65000	42000	38	19000	750	1.50	20000	39	24.0	<0.1	<2	2.1	110	1500	0.6	1.5	120	7.2	110	<0.1
08-022	0.22	88000	25	680	2.3	0.24	9400	<0.03	18	59	55	71000	38000	45	19000	810	<0.05	23000	35	13.0	0.2	<2	1.9	100	1200	0.6	1.5	120	7.8	130	<0.1
08-025	0.12	100000	80	700	2.3	0.24	6300	0.09	20	67	58	72000	43000	42	20000	840	0.92	20000	31	30.0	0.3	<2	2.3	85	1300	0.5	1.6	130	8.1	120	<0.1
08-028	0.22	110000	430	870	2.9	0.28	8000	<0.03	22	64	110	71000	45000	49	20000	800	0.53	15000	35	15.0	0.3	<2	3.0	85	1800	0.6	1.6	180	8.8	140	<0.1
08-029	0.23	84000	2100	640	2.1	0.76	13000	0.13	16	59	64	50000	34000	33	14000	820	4.10	21000	28	37.0	2.5	<2	2.0	74	1200	0.7	1.5	110	8.4	100	<0.1
08-030	0.35	90000	340	740	2.5	0.48	9000	0.20	18	81	88	59000	38000	44	18000	710	0.90	18000	37	30.0	<0.1	<2	2.1	78	1500	0.7	1.8	140	8.6	130	<0.1
08-031	0.35	94000	800	770	2.5	0.27	17000	0.05	19	59	85	52000	39000	35	16000	890	<0.05	20000	34	10.0	0.3	<2	11.0	80	1800	0.7	1.7	130	7.2	120	<0.1
08-032	0.28	77000	72	730	2.4	0.19	8400	0.19	15	58	80	58000	40000	39	17000	680	0.49	22000	29	7.2	0.9	<2	2.4	71	2500	1.2	1.6	140	6.3	110	<0.1
08-033	0.29	78000	900	860	2.1	0.32	14000	0.14	21	84	88	57000	35000	37	16000	850	1.70	23000	34	14.0	2.5	<2	2.2	82	1800	0.6	1.6	120	7.5	120	<0.1
08-036	0.85	99000	3100	850	3.1	1.20	14000	0.19	22	72	130	64000	43000	40	18000	1000	1.70	22000	33	40.0	3.0	<2	3.1	100	1700	0.6	1.8	140	7.1	130	<0.1
08-038	0.80	92000	890	750	2.1	0.64	6400	0.19	14	54	78	57000	39000	32	17000	760	0.95	22000	29	17.0	0.6	<2	2.2	81	1800	0.6	1.4	110	6.4	120	<0.1
08-041	0.30	93000	100	700	2.4	0.19	6800	0.09	19	61	68	73000	42000	48	21000	780	1.20	25000	35	10.0	<0.1	<2	2.5	92	2200	0.6	1.5	130	5.5	120	<0.1
08-043	0.17	90000	100	860	2.1	0.18	10000	0.20	18	56	62	58000	38000	37	17000	840	1.80	29000	31	10.0	0.2	<2	1.7	110	2500	0.6	1.7	110	5.4	110	<0.1
08-044	0.25	78000	60	710	2.2	0.24	7800	<0.03	14	56	27	45000	32000	38	13000	800	0.49	5300	28	15.0	0.4	<2	3.2	66	3500	0.8	1.8	120	7.0	120	<0.1
08-046	0.19	74000	94	860	2.1	0.17	6800	0.11	16	59	28	44000	32000	35	13000	860	0.91	5700	32	11.0	0.2	<2	2.7	91	1700	0.7	1.8	110	6.0	110	<0.1
08-047	0.18	79000	390	860	2.1	0.13	10000	0.08	13	47	32	44000	30000	35	14000	760	0.28	5500	30	8.3	0.4	<2	2.6	98	2600	0.7	1.6	110	6.8	110	<0.1
08-048	0.26	88000	160	860	2.1	0.18	14000	0.13	17	58	27	39000	27000	33	12000	860	0.84	5300	32	15.0	0.3	<2	2.6	98	3100	0.7	2	110	10.0	110	<0.1
08-049	0.28	74000	1500	630	1.9	0.67	10000	0.10	14	58	44	44000	30000	31	13000	780	0.62	5800	31	18.0	2.0	<2	2.5	87	2100	0.6	1.4	97	9.5	110	<0.1
08-050	0.30	94000	86	830	1.9	0.35	12000	0.11	15	57	31	57000	38000	34	17000	830	0.88	7000	31	20.0	<0.1	<2	2.4	91	3000	0.7	1.8	110	9.0	120	<0.1
08-053	0.27	88000	59	830	1.9	0.18	10000	0.08	18	53	40	58000	35000	34	15000	790	0.90	8900	34	11.0	0.2	<2	2.4	100	2600	0.6	1.7	100	8.2	100	<0.1
08-054	0.18	88000	76	490	1.5	0.21	13000	0.05	17	45	31	56000	27000	35	18000	1100	1.00	12000	34	19.0	0.2	<2	2.0	110	2700	0.5	1.7	89	19.0	98	<0.1
08-067	0.27	87000	620	550	1.9	0.33	1900	0.09	15	47	79	54000	39000	29	15000	410	3.20	1200	32	13.0	2.8	<2	2.4	35	1100	0.8	1.4	90	7.0	66	<0.1
08-071	0.38	79000	3800	580	2.0	0.45	9500	0.26	20	55	58	65000	30000	32	15000	1100	1.40	1400	38	48.0	8.2	3	2.2	45	1100	0.7	1.6	95	11.0	110	<0.1
08-073	0.84	100000	7500	890	2.3	1.40	15000	0.44	22	67	54	65000	39000	29	18000	1100	1.20	6200	42	27.0	2.7	3	3.2	140	1800	0.8	2	120	7.6	120	<0.1
08-074	0.52	90000	160	800	2.0	0.47	9200	0.16	15	60	38	56000	33000	31	14000	810	0.82	5700	34	20.0	0.3	<2	2.8	75	2700	0.8	1.7	120	6.9	100	<0.1
08-076	0.26	72000	1800	480	1.9	0.65	1800	0.04	14	57	78	50000	29000	35	12000	510	1.60	1100	29	8.5	3.8	4	2.2	40	1100	0.9	1.5	93	8.0	72	<0.1
08-077	0.50	89000	290	580	2.0	0.28	5800	0.15	17	62	58	59000	34000	31	14000	700	0.38	5100	38	14.0	0.4	2	2.5	60	3100	0.8	1.6	110	5.8	86	<0.1
08-078	0.72	86000	310	530	1.8	0.47	9800	0.22	13	63	29	52000	31000	28	13000	780	1.60	7700	30	17.0	0.2	3	2.8	85	2700	0.6	1.6	110	7.0	91	<0.1
08-079	0.46	89000	9200	590	2.1	1.50	6800	0.18	14	62	31	59000	34000	31	15000	780	1.50	5200	34	34.0	3.2	<2	3.0	73	1800	0.6	1.5	100	5.8	100	<0.1
08-080	1.10	83000	15000	550	2.2	1.50	5000	0.24	15	64	84	55000	34000	27	14000	620	1.70	5300	33	27.0	2.8	<2	3.1	72	1100	0.6	1.6	110	5.0	93	<0.1
08-083	0.38	93000	11000	620	2.1	1.80	6500	0.22	19	63	71	63000	37000	30	16000	810	0.97	5300	38	34.0	4.0	2	3.3	89	1400	0.6	1.6	120	5.2	110	<0.1
08-084	0.19	86000	350	580	2.0	0.52	5800	0.16	14	67	42	60000	33000	34	15000	740	0.57	8400	38	27.0	0.4	<2	3.0	64	3100	0.6	1.9	120	6.3	110	<0.1
COMPOSITE																															
08-007	0.11	74000	53	820	2.2	0.14	20000	0.12	15	63	40	50000	33000	33	14000	980	1.50	10000	27	12.0	0.2	<2	2.7	120	2400	0.7	1.7	110	7.2	97	<0.1
08-018	0.31	83000	73	840	2.1	0.33	23000	0.08	14	60	78	58000	34000	35	15000	1100	2.10	27000	26	20.0	0.2	<2	2.0	130	1400	0.6	1.6	120	6.4	110	<0.1
08-023	0.18	84000	850	830	2.2	0.38	17000	0.17	17	56	89	61000	34000	42	17000	1000	3.60	26000	32	17.0	0.9	<2	2.0	160	1500	0.7	1.4	120	6.7	110	<0.1
08-027	0.18	86000	500	810	2.1	0.20	12000	0.11	17	74	54	58000	35000	38	17000	820	2.10	25000	30	38.0	0.7	<2	2.0	120	1600	0.6	1.5	120	7.3	110	<0.1
08-035	0.22	91000	120	680	2.5	0.28	25000	0.15	12	80	75	45000	32000	31	13000	1000	1.90	27000	21	10.0	0.5	<2	2.4	180	2700	0.8	1.8	130	9.5	100	<0.1
08-045	0.16	78000	66	590	1.9	0.25	11000	0.05	12	61	31	44000	30000	33	13000	810	0.75	8900	27	17.0	0.2	<2	2.5	110	2100	0.6	1.6	110	6.7	100	<0.1
08-051	0.15	84000	61	570	2.0	0.24	12000	0.18	12	53	40	58000	32000	36	17000	850	1.30	12000	29	14.0	<0.1	<2	2.2	110	2000	0.6	2.3	110	9.9	120	<0.1
08-052	0.21	82000	810	500	1.7	0.42	10000	<0.05	16	50	34	47000	28000	28	14000	750	1.70	14000	32	21.0	1.2	<2	2.2	110	2400	0.5	1.8	94	9.1	90	<0.1
08-055	0.24	90000	60	610	1.9	0.17	3300	0.08	13	52	27	50000	35000	34	15000	780	1.30	11000	27	11.0	0.1	<2	2.8	70	2700	0.7	1.7	110	9.3	87	<0.1
08-058	0.25	88000	25	590	1.8	0.06	8700	0.06	11	59	20	46000	33000	30	15000	680	2.80	13000	22	4.9	1.4	<2	2.8	77	2300	0.6	1.9	120	9.7	92	<0.1
08-059	0.22	71000	170	400	1.4	0.23	48000	0.10	13	40	26	34000	23000	19	13000	1400	1.50	17000	30	14.0	0.7	<2	3.1	210	1100	0.5	1.4	81	15.0	66	<0.1
08-062	0.26	91000	71	580	1.6	0.16	4400	0.05	13	56	29	50000	33000	33	15000	600	2.20	11000	29	10.0	0.2	<2	2.5	70	2300	0.7	1.8	100	9.6	87	<0.1
08-064	0.19	86000	86	580	1.8	0.21	8400	0.11	17	51	25	52000	32000	31	15000	790	1.40	12000	31	11.0	0.2	<2	2.6	71	2300	0.7	1.7	100	11.0	85	<0.1
08-069	0.19	85000	62	670	1.5	0.21	20000	<0.03	11	48	40	44000	27000	25	11000	1000	1.60	12000	33	13.0	<0.1	<2	2.3	90	1300	0.5	1.6	90	11.0	78	<0.1
08-070	0.20	72000	340	390	1.5	0.17	8000	0.05	11	48	30	40000	22000	16	11000	780	2.60	15000	27	40.0	0.5	3	2.0	73	780	0.6	1.4	80	9.5	64	<0.1
GREYWACKE (20%-80% ARGILLITE INTERBEDS																															
08-001	0.16	85000	69	520	1.9	0.28	10000	0.12	16	60	87	51000	30000	25	12000	840	1.60	13000	40	17.0	0.3	<2	2.6	110	2100	0.6	1.8	110	5.2	92	<0.1
08-002	0.24	86000	62	680	2.2	0.31	6100	0.06	16	62	47	62000	37000	37	17000	890	1.10	8500	33	13.0	0.3	<2	3.2	95	2500	0.8	1.8	120	5.7	110	<0.1
08-005	0.37	73000	150	540	1.8	0.32	12000	0.07	18	61	44	51000	31000	25	13000	930	1.90	11000	28	16.0	0.4	<2	2.6	120	2200	0.6	1.7	110	5.5	94	<0.1
08-011	0.18	78000	32	500	1.7	0.21	12000	0.05	14	47	38	43000	25000	24	13000	850	2.20	17000	26	12.0	0.4	<2	2.3	130	1500	0.6	1.8	110	8.7	82	<0.1
08-013	0.27	56000	590	270	1.1	0.14	18000	0.13	9	61	23	28000	15000	12	8800	620	3.80	21000	18	14.0	0.4	<2	1.7	120	870	0.4	1.8	75	9.4	50	<0.1
08-015	0.12	61000	42	340	1.3	0.15	11000	0.05	10	45	30	33000	18000	14	10000	880	2.30	19000	23	12.0	0.2	<2	1.6	110	1300	0.4	1.7	79	7.3	57	<0.1
08-020	0.12	82000	86	400	1.5	0.25	28000	0.09	14	41	68	48000	23000	29	12000	1200	3.40	32000	26	8.4	0.7	<2	1.1	140	770	0.4	1.3	83	9.9	78	<0.1
08-024	0.28	88000	70	510	1.7	0.19	16000	<0.03	12	67	53	45000	25000	26	12000	780	1.20	31000	22	28.0	<0.1	<2	1.4	150	1100	0.8	1.3	87	7.8	81	<0.1
08-026	0.25	88000	500	580	2.0	0.55	14000	0.13	26	59	69	49000	29000	29	13000	790	2.30	28000	23	27.0	0.7	<2	1.8	130	990	1.5	1.7	110	8.3	89	<0.1
08-034	0.46	73000	2300	380	1.4	0.13	22000	0.19	9	50	31	35000	19000	20	10000	680	1.70	35000	15	11.0	3.0	<2	1.7	180	3100	0.4	1.7	90	11.0	74	<0.1
08-039	0.38	80000	7000	500	1.8	1.20	13000	0.06	14	59	50	47000	31000	29	13000	700	2.30	37000	22	33.0	1.8	<2	2.3	130	1200	0.5	1.7	110	11.0	74	<0.1
08-057	0.18	72000	37	390	1.2	0.13	26000	0.06	11	47	18	33000	23000	17	9500	910	1.70	18000	18	12.0	0.1	<2	2.0	110	1400	0.4	1.5	81	11.0	57	<0.1
GREYWACKE (<20% ARGILLITE INTERBEDS																															
08-056	0.18	59000	19	290	1.0	0.15	29000	<0.03	8	40	19	27000	18000	13	7000	910	2.40	20000	19	12.0	0.1	<2	1.8	87	1300	0.4	1.8	80	11.0	43	<0.1
08-060	0.13	63000	110	260	1.0	0.13	27000	<0.03	9	32	21	30000	15000	18	11000	760	2.50	22000	25	9.9	0.3	<2	1.5	120	750	0.3	1.3	88	11.0	50	<0.1
08-061	0.33	62000	28	220	0.8	0.09	14000	0.07	7	24	10	27000	13000	12	10000	780	2.60	25000	19	15.0	0.1	<2	1.5	100	730	0.2	1.4	81	11.0	41	<0.1
08-063	0.19	65000	51	330	1.0	0.09	18000	0.07	7	37	11	28000	19000	13	7400	700	2.00	19000	14	9.2	0.1	<2	1.9	100	1700	0.4	1.5	70	9.9	42	<0.1
08-065	0.27	74000	53	390	1.2	0.10	19000	0.15	12	48	18	35000	23000	17	10000	830	1.40	17000	23	12.0	0.1	<2	1.9	140	2300	0.4	1.8	88	11.0	61	<0.1
08-066	0.17	61000	3000	430	1.5	0.18	11000	0.23	10	48	36	37000	26000	16	10000	780	4.30	21000	21	27.0	1.6	<2	2.0	120	1000	0.5	1.8	81	10.0	66	<0.1
08-068	0.14	70000	52	380	1.2	0.12	13000	0.08	10	41	18	30000	21000	16	8400	590	3.20	18000	20	10.0	<0.1	<2	1.8	100	1200	0.4	1.7	78	11.0	54	<0.1
08-072	0.32	59000	28	230	1.1	0.12	7200	0.18	8	30	15	29000	15000	17	11000	700	2.20	20000	20	14.0	0.3	<2	1.9	100	710	0.3	1.2	82	8.5	56	<0.1
08-075	0.25	67000	5200	300	1.5	0.54	9000	0.17	11	49	17	39000	25000	28	12000	650	2.60	900	29	17.0	2.7	3	1.7	42	780	0.8	1.5	78	6.9	51	<0.1
08-081	0.28	88000	420	240	1.0	0.24	7000	0.05	11	46	24	33000	15000	13	8500	560	2.00	18000	21	15.0	0.4	<2	1.6	98	2100	0.4	1.7	71	8.2	57	<0.1
MARGINAL ORE																															
08-008	0.28	87000	2200	880	2.2	0.45	13000	0.09	18	60	47	50000	39000	27	13000	780	0.85	5800	31	13.0	0.9	<2	3.0	87	1800	0.8	1.7	110	6.0	100	<0.1
08-085	0.23	77000	460	570	2.2	0.30	8800	<0.03	18	65	53	52000	33000	30	13000	720	1.40	4800	39	22.0	2.0	<2	3.2	89	1500	0.8	1.7	100	6.2	99	<0.1
08-086	0.21	88000	470	580	2.1	0.13	11000	0.23	17	60	74	52000	31000	29	13000	740	0.85	5500	38	10.0	1.4	<2	2.6	72	1600	0.8	1.7	98	8.8	84	<0.1
08-087	0.15	87000	330	550	2.0	0.15	11000	0.12	15	62	50	58000	31000	31	14000	780	0.41	5400	32	9.5	0.6	2	2.3	66	1500	0.7	1.5	100	8.2	100	<0.1
08-088	0.22	88000	290	550	2.0	0.21	13000	0.17	18	64	67	61000	31000	33	15000	820	0.59	4000	36	12.0	0.4	4	2.5	78	2000	0.7	1.9	110	7.8	100	<0.1
08-089	0.12	80000	1900	500	1.9	0.19	8100	0.14	12	55	41	51000	29000	28	13000	700	0.61	8800	32	8.7	2.3	<2	2.5	74	2200	0.7	1.5	92	7.8	85	<0.1
08-090	0.10	79000	740	480	1.8	0.11	8800	0.09	11	50	16	49000	29000	29	13000	740	0.69	7300	25	7.5	1.0	<2	2.4	73	2100	0.8	1.5	100	8.1	86	<0.1
08-091	0.18	84000	8	500	1.9	0.08	4200	0.08	9	62	38	58000	29000	38	17000	610	0.40	5800	35	8.1	<0.1	3	2.1	63	1800	0.7	1.9	100	8.0	120	<0.1
08-092	0.61	94000	130	580	2.1	0.18	7100	0.15	18	62	30	59000	33000	35	16000	780	0.31	5200	31	16.0	0.4	<2	2.9	74	1500	0.7	1.7	110	7.2	110	<0.1
08-093	0.14	87000	69	610	2.3	0.16	5500	0.25	15	66	58	58000	34000	36	17000	860	1.20	1800	36	17.0	0.8	2	2.4	48	1400	0.7	1.6	100	6.6	120	<0.1
08-094	<0.03	82000	130	430	1.6	0.17	9800	0.08	11	50	32	59000	28000	19	9800	580	1.40	14000	22	13.0	0.2	<2	1.9	110	1800	0.7	1.8	94	8.5	86	<0.1
QUARTZ VEIN																															
08-037	0.73	13000	250	33	0.1	2.30	11000	<0.03	4	32	38	11000	2000	<3	1000	500	11.00	28000	15	70.0	0.1	<2	0.2	15	94	0.9	0.18	8	2.2	11	<0.1
TAILINGS																															
CND 2 Treated Solids	0.35	70000	180	400	0.34	0.40	6300	0.10	9.1	120	108	50000	12000	60	14000	3800	5.20	3500	44	19.0	2.1	<1	3.2	82	2500	0.8	1.7	130	7.2	34	<0.1

Appendix A-3
Acid-Base Accounting Results

Sample	Paste pH	NP	AP	Net NP	NP/AP	S	Acid Leachable SO4-S	Sulphide-S	C	Carbonate	TIC	Carb-NP	Carb-NP/AP
#	units	t CaCO3/1000t	t CaCO3/1000 t	t CaCO3/1000 t	ratio	%	%	%	%	%	%	t CaCO3/1000 t	ratio
ARGILLITE (5-49%) GREYWACKE													
06-012	9.3	41.40	2.5	38.9	16.6	0.11	0.03	0.08	0.59	1.92	0.38	32.0	12.8
06-016	9.3	45.00	6.9	38.2	6.6	0.24	0.02	0.22	0.61	2.35	0.47	39.2	5.7
06-021	9.4	46.70	0.9	45.8	49.8	0.05	0.02	0.03	0.62	2.16	0.43	36.0	40.0
06-040	8.8	21.20	3.1	18.0	6.8	0.13	0.03	0.10	0.41	1.31	0.26	21.8	7.0
06-042	8.8	37.10	3.8	33.4	9.9	0.34	0.22	0.12	0.57	1.93	0.39	32.2	8.5
06-082	8.6	41.90	11.9	30.0	3.5	0.66	0.28	0.38	0.86	2.92	0.58	48.7	4.1
DA 7357	8.8	115.07	3.5	111.6	32.9	0.11	0.01	0.10	6.11	-	-	101.9	29.1
ARGILLITE (<5% GREYWACKE)													
06-004	9.4	25.30	2.2	23.1	11.5	0.07	< 0.01	0.07	0.34	1.24	0.25	20.7	9.4
06-005	9.4	22.10	4.4	17.7	5.0	0.17	0.03	0.14	0.23	0.77	0.15	12.8	2.9
06-006	9.4	33.00	5.6	27.4	5.9	0.22	0.04	0.18	0.38	1.48	0.30	24.7	4.4
06-009	9.4	31.40	8.4	22.9	3.7	0.30	0.03	0.27	0.42	1.52	0.30	25.4	3.0
06-010	9.3	51.80	7.8	44.0	6.6	0.29	0.04	0.25	0.65	2.54	0.51	42.4	5.4
06-014	9.2	33.80	9.1	24.8	3.7	0.32	0.04	0.29	0.49	2.00	0.40	33.4	3.7
06-017	9.4	20.10	0.9	19.1	21.4	0.03	< 0.01	0.03	0.24	0.92	0.19	15.3	17.0
06-019	9.4	31.60	5.9	25.7	5.3	0.25	0.06	0.19	0.40	1.40	0.28	23.4	4.0
06-022	9.4	22.80	1.2	21.6	18.3	0.07	0.03	0.04	0.28	1.18	0.24	19.7	16.4
06-025	9.2	22.30	1.6	20.7	14.3	0.10	0.05	0.05	0.28	1.06	0.21	17.7	11.0
06-028	9.3	18.60	5.0	13.6	3.7	0.30	0.14	0.16	0.25	1.12	0.22	18.7	3.7
06-029	9.3	31.00	6.2	24.8	5.0	0.34	0.14	0.20	0.46	0.91	0.18	15.2	2.4
06-030	9.3	23.20	2.2	21.0	10.6	0.10	0.03	0.07	0.27	1.95	0.39	32.5	14.8
06-031	9.4	37.70	4.7	33.0	8.0	0.40	0.25	0.15	0.48	0.99	0.20	16.5	3.5
06-032	9.6	21.70	3.4	18.2	6.3	0.19	0.08	0.11	0.28	2.04	0.41	34.0	10.0
06-033	9.5	33.80	3.8	30.1	9.0	0.27	0.15	0.12	0.43	1.67	0.34	27.9	7.3
06-036	9.0	42.00	14.7	27.4	2.9	1.14	0.67	0.47	0.71	3.05	0.61	50.9	3.5
06-038	9.4	32.50	7.8	24.7	4.2	0.58	0.33	0.25	0.51	1.91	0.38	31.9	4.1
06-041	8.9	22.30	3.8	18.6	6.0	0.16	0.04	0.12	0.32	1.04	0.21	17.3	4.6
06-043	8.8	30.30	1.9	28.4	16.2	0.13	0.07	0.06	0.48	2.10	0.42	35.0	18.4
06-044	9.4	27.70	2.8	24.9	9.9	0.17	0.08	0.09	0.40	1.28	0.26	21.3	7.6
06-046	9.4	22.90	2.8	20.1	8.1	0.16	0.07	0.09	0.34	1.34	0.27	22.3	8.0
06-047	9.3	28.20	3.4	24.8	8.2	0.18	0.07	0.11	0.38	1.68	0.34	28.0	8.2
06-048	9.4	34.20	2.5	31.7	13.7	0.13	0.05	0.08	0.43	1.87	0.37	31.2	12.5
06-049	9.4	29.20	6.9	22.3	4.2	0.29	0.07	0.22	0.36	1.51	0.30	25.2	3.7
06-050	9.5	30.60	4.4	26.2	7.0	0.19	0.05	0.14	0.46	1.91	0.38	31.9	7.2
06-053	9.6	32.50	5.0	27.5	6.5	0.25	0.09	0.16	0.31	1.19	0.24	19.8	4.0
06-054	9.8	32.00	1.2	30.8	25.6	0.06	0.02	0.04	0.42	1.85	0.37	30.9	25.7
06-067	8.9	7.90	21.2	-13.3	0.4	0.92	0.24	0.68	0.10	0.30	0.06	5.0	0.2
06-071	9.4	33.20	14.4	18.8	2.3	0.48	0.02	0.46	0.39	1.62	0.32	27.0	1.9
06-073	9.2	48.80	17.2	31.6	2.8	1.19	0.64	0.55	0.97	3.75	0.75	62.5	3.6
06-074	9.5	27.50	4.7	22.8	5.9	0.47	0.32	0.15	0.46	1.50	0.30	25.0	5.3
06-076	9.0	7.10	9.1	-2.0	0.8	0.39	0.10	0.29	0.17	0.50	0.10	8.3	0.9
06-077	9.4	19.30	5.0	14.3	3.9	0.42	0.26	0.16	0.24	0.82	0.17	13.7	2.7
06-078	9.6	30.10	2.5	27.6	12.0	0.33	0.25	0.08	0.47	1.58	0.32	26.4	10.5
06-079	9.4	28.60	15.9	12.7	1.8	1.20	0.69	0.51	0.49	1.96	0.39	32.7	2.1
06-080	9.3	21.40	24.4	-3.0	0.9	1.32	0.54	0.78	0.62	2.08	0.42	34.7	1.4
06-083	9.0	25.80	26.2	-0.4	1.0	1.62	0.78	0.84	0.73	2.77	0.56	46.2	1.8
06-084	9.7	19.00	4.4	14.6	4.3	0.35	0.21	0.14	0.37	1.18	0.24	19.7	4.5
DA 0423	8.0	73.43	4.7	68.8	15.8	0.149	0.01	0.14	2.43	-	-	40.5	8.7
DA 0562	7.7	50.24	5.5	44.8	9.2	0.175	0.02	0.16	1.80	-	-	30.0	5.5
DA 1693	8.8	30.46	3.2	27.3	9.7	0.101	0.00	0.10	0.94	-	-	15.7	5.0
DA 8107	8.7	48.31	5.1	43.3	9.5	0.162	0.02	0.14	1.88	-	-	31.3	6.2
COMPOSITE													
06-007	9.4	54.20	6.2	48.0	8.7	0.23	0.03	0.20	0.65	2.53	0.51	42.2	6.8
06-018	9.3	50.20	4.1	46.2	12.4	0.18	0.05	0.13	0.66	2.47	0.50	41.2	10.0
06-023	9.3	41.50	5.0	36.5	8.3	0.13	< 0.01	0.16	0.48	1.99	0.40	33.2	6.6
06-027	9.4	33.50	2.8	30.7	11.9	0.12	0.02	0.09	0.36	1.29	0.26	21.5	7.7
06-035	9.2	57.70	7.5	50.2	7.7	0.45	0.21	0.24	0.87	3.43	0.69	57.2	7.6
06-045	9.4	30.60	2.8	27.8	10.9	0.14	0.04	0.09	0.46	1.73	0.35	28.9	10.3
06-051	9.2	29.30	4.7	24.6	6.3	0.23	0.08	0.15	0.41	1.49	0.30	24.9	5.3
06-052	9.6	26.50	4.1	22.4	6.5	0.31	0.18	0.13	0.37	1.33	0.27	22.2	5.4
06-055	9.1	8.80	1.2	7.5	7.0	0.06	0.02	0.04	0.13	0.45	0.09	7.5	6.3
06-058	9.5	23.00	3.1	19.9	7.4	0.15	0.05	0.10	0.31	1.06	0.21	17.7	5.7
06-059	9.4	120.00	1.9	118.0	63.7	0.09	0.02	0.06	1.44	6.64	1.33	110.7	58.3
06-062	9.2	13.50	2.2	11.3	6.1	0.08	< 0.01	0.07	0.18	0.58	0.12	9.7	4.4
06-064	9.3	25.30	3.4	21.8	7.3	0.17	0.06	0.11	0.31	1.10	0.22	18.3	5.4
06-069	9.5	56.50	5.3	51.2	10.6	0.20	0.03	0.17	0.67	2.83	0.57	47.2	8.9
06-070	9.5	27.90	11.6	16.3	2.4	0.34	< 0.01	0.37	0.36	1.27	0.25	21.2	1.8
GREYWACKE (20%-50% ARGILLITE INTERBEDS)													
06-001	9.3	39.00	8.8	30.3	4.4	0.39	0.11	0.28	0.59	1.69	0.34	28.2	3.2
06-002	9.4	28.20	4.1	24.2	6.9	0.18	0.05	0.13	0.44	1.70	0.34	28.4	6.9
06-003	9.4	44.30	8.1	36.2	5.5	0.26	< 0.01	0.26	0.73	2.25	0.45	37.5	4.6
06-011	9.3	38.40	0.6	37.8	61.4	0.16	0.14	0.02	0.52	2.05	0.41	34.2	57.0
06-013	9.4	47.20	2.8	44.4	16.8	0.11	0.02	0.09	0.55	2.07	0.41	34.5	12.3
06-015	9.5	40.80	4.7	36.2	8.7	0.15	< 0.01	0.15	0.50	1.68	0.34	28.0	6.0
06-020	9.3	58.20	2.5	55.7	23.3	0.08	< 0.01	0.08	0.71	2.98	0.60	49.7	19.9
06-024	9.4	35.80	1.9	33.9	19.1	0.07	0.01	0.06	0.44	1.92	0.38	32.0	16.9
06-026	9.4	31.20	2.8	28.4	11.1	0.15	0.06	0.09	0.51	2.09	0.42	34.9	12.4
06-034	9.7	50.50	2.5	48.0	20.2	0.16	0.08	0.08	0.67	2.85	0.57	47.5	19.0
06-039	9.3	32.70	15.3	17.4	2.1	0.58	0.09	0.49	0.76	2.99	0.60	49.9	3.3
06-057	9.5	67.50	2.5	65.0	27.0	0.12	0.04	0.08	0.83	3.62	0.73	60.4	24.2
DA 0472	7.4	46.53	6.0	40.5	7.8	0.19	0.01	0.18	0.99	-	-	16.4	2.7
GREYWACKE (<20% ARGILLITE INTERBEDS)													
06-056	9.6	70.60	2.5	68.1	28.2	0.11	0.03	0.08	0.82	3.77	0.75	62.9	25.2
06-060	9.5	63.20	0.9	62.3	67.4	0.06	0.03	0.03	0.72	3.38	0.68	56.4	62.6
06-061	9.6	42.00	0.9	41.1	44.8	0.05	0.02	0.03	0.45	2.10	0.42	35.0	38.9
06-063	9.6	50.00	1.2	48.8	40.0	0.06	0.02	0.04	0.60	2.75	0.55	45.9	38.2
06-065	9.7	54.00	1.8	52.4	34.6	0.13	0.08	0.05	0.68	2.89	0.58	48.2	30.1
06-066	9.6	37.10	7.5	29.6	5.0	0.48	0.24	0.24	0.46	1.83	0.37	30.5	4.1
06-068	9.7	36.00	2.5	33.5	14.4	0.08	< 0.01	0.08	0.41	1.57	0.31	26.2	10.5
06-072	9.7	28.20	1.2	27.0	22.6	0.04	< 0.01	0.04	0.32	1.22	0.24	20.3	17.0
06-075	9.4	34.00	5.6	28.4	6.0	0.30	0.12	0.18	0.42	1.61	0.32	26.9	4.8
06-081	8.9	21.80	3.4	18.4	6.3	0.16	0.05	0.11	0.31	1.05	0.21	17.5	5.2
DA 0070	8.7	28.35	1.3	27.0	21.1	0.04	0.00	0.04	1.34	-	-	22.3	16.6
DA 1151	9.0	64.31	2.4	61.9	26.4	0.08	0.00	0.07	2.02	-	-	33.6	13.8
DA 1154	9.0	57.03	1.3	55.7	44.5	0.04	0.00	0.04	2.24	-	-	37.4	29.2
DA 0879	8.3	44.63	4.3	40.4	10.5	0.14	0.00	0.13	2.07	-	-	34.5	8.1
DA 8413	8.6	133.12	19.2	113.9	6.9	0.62	0.01	0.61	7.33	-	-	122.3	6.4
MARGINAL ORE													
06-008	9.1	39.40	13.1	26.3	3.0	0.53	0.11	0.42	0.59	2.30	0.46	38.4	2.9
06-085	9.6	28.50	6.9	21.7	4.2	0.48	0.26	0.22	0.35	1.25	0.25	20.8	3.0
06-086	9.5	31.60	8.8	22.8	3.6	0.48	0.20	0.28	0.37	1.40	0.28	23.4	2.7
06-087	9.4	33.80	5.0	28.8	6.8	0.52	0.36	0.19	0.39	1.58	0.32	26.4	5.3
06-088	9.5	22.10	3.4	18.6	6.4	0.41	0.30	0.11	0.52	2.07	0.41	34.5	10.2
06-089	9.5	28.60	4.7	24.9	8.3	0.51	0.36	0.15	0.39	1.72	0.34	28.7	6.1
06-090	9.6	30.80	2.5	28.3	12.3	0.12	0.04	0.08	0.36	1.61	0.32	26.9	10.7
06-091	9.5	16.30	2.5	13.8	6.5	0.17	0.09	0.08	0.21	0.73	0.15	12.2	4.9
06-092	9.5	22.90	3.1	19.8	7.3	0.14	0.04	0.10	0.32	1.23	0.25	20.5	6.6
06-093	8.8	23.00	9.7	13.3	2.4	0.57	0.26	0.31	0.28	1.01	0.20	16.8	1.7
06-094	9.1	29.60	7.8	21.8	3.8	0.32	0.07	0.25	0.43	1.70	0.34	28.4	3.6
QUARTZ VEIN													
06-037	8.7	27.50	10.0	17.5	2.8	0.42	0.10	0.32	0.33	1.11	0.22	18.5	1.9
TAILINGS													
CND 2 Treated Solids	9.3	21.5	3.4375	18.0625	6.3	0.17	< 0.4	0.11	0.38	1.22	-	20.3	5.9
ORE													
DA 0087	8.2	46.06	17.3	28.8	2.7	0.55	0.01	0.55	1.21	-	-	20.2	1.2
DA 0351	8.0	50.74	16.8	33.9	3.0	0.54	0.00	0.54	1.39	-	-	23.2	1.4
DA 0398	7.3	13.85	11.8	2.1	1.2	0.38	0.02	0.36	1.03	-	-	17.2	1.5
DA 0402	7.6	52.72	13.9	38.8	3.8	0.44	0.01	0.43	2.46	-	-	41.1	3.0
DA 0577	8.6	60.50	30.7	29.8	2.0	0.96	0.02	0.96	1.79	-	-	29.9	1.0
DA 7399	8.6	45.16	17.2	28.0	2.6	0.55	0.01	0.54	1.57	-	-	26.2	1.5
DA 7278	8.9	83.47	17.2	66.3	4.9	0.55	0.00	0.56	3.27	-	-	54.5	3.2
DA 0898	7.9	85.37	4.3	81.1	15.4	0.14	0.00	0.13	2.33	-	-	38.8	9.1
DA 8157	8.7	30.51	7.2	23.3	4.2	0.23	0.01	0.22	0.81	-	-	13.4	1.9

Sample	pH	Alkalinity	Acidity	SO_4	Cl	Hg	Al	As	Ag	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Li	K	Mg	Mn	Mo	Na	Ni	Pb	P	Sb	S	Se	Sr	Ti	V	W	Zn
#	units	mg/L as CaCO3	mg/L as CaCO3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
ARGILLITE (5-49%) GREYWACKE																																			
06-016	8.33	35	< 2	11.0	< 2	< 0.0001	0.32	0.09	< 0.0001	0.31	< 0.0004	< 0.00002	8.26	< 0.00006	0.00004	< 0.001	0.0007	0.06	< 0.002	9.38	1.66	0.0030	0.0013	5.85	0.0017	0.0007	< 0.01	0.0034	4.54	< 0.003	0.0309	0.0024	0.0013	0.0002	0.0054
06-042	7.79	35	< 2	22.0	< 2	< 0.0001	0.12	0.01	< 0.0001	0.26	< 0.0004	< 0.00002	12.20	< 0.00006	0.00005	< 0.001	0.0004	0.03	< 0.002	8.60	2.51	0.0113	0.0080	7.14	0.0010	0.0005	0.01	0.0014	9.35	< 0.003	0.0342	0.0006	0.0004	0.0046	0.0085
06-082	7.58	45	< 2	110.0	2.1	< 0.0001	0.07	0.10	< 0.0001	0.14	< 0.0004	< 0.00002	42.00	< 0.00006	0.00011	< 0.001	0.0002	< 0.01	2.05	13.10	6.21	0.0908	0.0012	9.67	0.0029	0.0005	0.73	0.3000	47.00	< 0.003	0.0695	0.0017	0.0003	0.0010	0.0398
ARGILLITE (<5% GREYWACKE)																																			
06-009	7.71	28	< 2	19.0	< 2	< 0.0001	0.33	0.05	< 0.0001	0.24	< 0.0004	< 0.00002	11.10	< 0.00006	0.00001	< 0.001	0.0004	0.03	< 0.002	7.69	1.63	0.0038	0.0005	5.63	0.0045	0.0010	< 0.01	0.0010	9.69	< 0.003	0.0239	0.0014	0.0008	0.0003	0.0063
06-022	7.75	33	< 2	6.5	3.5	< 0.0001	0.54	0.06	< 0.0001	0.37	< 0.0004	0.00	6.07	< 0.00006	0.00012	< 0.001	0.0004	0.17	< 0.002	10.00	1.05	0.0031	0.0006	6.93	0.0016	0.0008	< 0.01	0.0032	2.50	< 0.003	0.0203	0.0061	0.0013	0.0002	0.0060
06-025	8.3	32	< 2	11.0	2.5	< 0.0001	0.55	0.09	< 0.0001	0.33	< 0.0004	0.00	7.42	< 0.00006	0.00012	< 0.001	0.0006	0.13	< 0.002	8.33	0.89	0.0050	0.0010	8.97	0.0032	0.0008	< 0.01	0.0037	5.72	< 0.003	0.0191	0.0086	0.0015	0.0003	0.0062
06-028	7.87	31	< 2	9.0	2.2	< 0.0001	0.53	0.11	< 0.0001	0.35	< 0.0004	< 0.00002	7.36	< 0.00006	0.00007	< 0.001	0.0005	0.12	< 0.002	8.37	1.26	0.0024	0.0006	5.98	0.0023	0.0006	< 0.01	0.0065	4.13	< 0.003	0.0183	0.0044	0.0014	0.0003	0.0057
06-032	7.84	30	< 2	15.0	2.1	< 0.0001	0.33	0.05	< 0.0001	0.28	< 0.0004	< 0.00002	9.60	< 0.00006	0.00005	< 0.001	0.0003	0.04	< 0.002	10.40	1.49	0.0013	0.0016	5.62	0.0029	0.0008	< 0.01	0.0015	7.21	< 0.003	0.0229	0.0020	0.0011	0.0006	0.0057
06-038	7.83	30	< 2	100.0	< 2	< 0.0001	0.13	0.02	< 0.0001	0.10	< 0.0004	< 0.00002	39.70	< 0.00006	0.00007	< 0.001	0.0002	< 0.01	< 0.002	9.71	6.39	0.0744	0.0004	5.51	0.0014	0.0005	< 0.01	0.0010	42.40	< 0.003	0.0558	< 0.0002	0.0001	0.0004	0.0085
06-044	8.06	35	< 2	6.8	< 2	< 0.0001	0.51	0.01	< 0.0001	0.36	< 0.0004	< 0.00002	8.02	< 0.00006	0.00008	< 0.001	0.0003	0.10	< 0.002	10.50	1.87	0.0040	0.0007	3.98	0.0008	0.0007	< 0.01	0.0025	3.99	< 0.003	0.0196	0.0043	0.0008	0.0005	0.0060
06-049	7.93	33	< 2	16.0	3.1	< 0.0001	0.60	0.03	< 0.0001	0.27	< 0.0004	< 0.00002	8.82	< 0.00006	0.00012	< 0.001	0.0010	0.43	< 0.002	10.70	1.69	0.0067	0.0004	6.48	0.0020	0.0010	0.02	0.0012	7.22	< 0.003	0.0255	0.0051	0.0008	0.0004	0.0087
06-050	7.88	31	< 2	13.0	< 2	< 0.0001	0.48	0.01	< 0.0001	0.31	< 0.0004	< 0.00002	8.24	< 0.00006	0.00003	< 0.001	0.0003	0.04	< 0.002	8.43	1.13	0.0022	0.0005	5.78	0.0017	0.0012	< 0.01	0.0010	5.83	< 0.003	0.0239	0.0026	0.0009	0.0003	0.0086
06-054	7.98	34	< 2	7.9	< 2	< 0.0001	0.40	0.02	< 0.0001	0.31	< 0.0004	< 0.00002	6.84	< 0.00006	0.00001	< 0.001	0.0005	0.02	< 0.002	7.78	1.41	0.0011	0.0004	6.79	< 0.0007	0.0007	< 0.01	0.0011	3.19	< 0.003	0.0183	0.0019	0.0011	0.0002	0.0050
06-067	7.53	35	< 2	100.0	< 2	< 0.0001	0.03	0.04	< 0.0001	0.16	< 0.0004	< 0.00002	32.70	< 0.00006	0.00048	0.005	0.0005	0.03	< 0.002	13.60	6.37	0.1260	0.0092	5.78	0.0029	0.0006	< 0.01	0.0070	35.30	< 0.003	0.1130	0.0004	0.0001	0.0004	0.0528
06-073	8.09	58	< 2	25.0	2.9	< 0.0001	0.38	0.28	< 0.0001	0.31	< 0.0004	< 0.00002	15.50	< 0.00006	0.00003	< 0.001	0.0003	0.06	< 0.002	16.70	2.94	0.0102	0.0004	9.25	0.0012	0.0009	< 0.01	0.0018	16.30	< 0.003	0.0324	0.0018	0.0007	0.0018	0.0483
06-076	7.79	33	< 2	67.0	3	< 0.0001	0.13	0.08	< 0.0001	0.20	< 0.0004	< 0.00002	24.50	< 0.00006	0.00013	< 0.001	0.0007	0.03	< 0.002	16.10	4.10	0.0171	0.0026	8.23	0.0080	0.0005	< 0.01	0.0272	26.20	< 0.003	0.0861	0.0007	0.0005	0.0017	0.0515
06-078	7.79	44	< 2	8.1	< 2	< 0.0001	0.64	0.19	< 0.0001	0.57	< 0.0004	0.00	9.08	< 0.00006	0.00009	< 0.001	0.0007	0.38	< 0.002	13.50	1.29	0.0059	0.0008	7.73	0.0017	0.0009	< 0.01	0.0017	4.61	< 0.003	0.0259	0.0090	0.0022	0.0010	0.0753
06-079	7.69	46	< 2	15.0	< 2	< 0.0001	0.52	1.09	< 0.0001	0.43	< 0.0004	0.00	11.90	< 0.00006	0.00003	< 0.001	0.0005	0.22	< 0.002	12.30	2.91	0.0093	0.0006	7.84	0.0013	0.0011	< 0.01	0.0044	9.54	< 0.003	0.0299	0.0077	0.0018	0.0016	0.0487
06-080	7.36	41	< 2	26.0	< 2	< 0.0001	0.37	1.25	< 0.0001	0.32	< 0.0004	< 0.00002	14.30	< 0.00006	0.00004	< 0.001	0.0006	0.13	< 0.002	14.80	3.15	0.0167	0.0003	7.45	< 0.0007	0.0009	0.01	0.0019	15.40	< 0.003	0.0301	0.0053	0.0017	0.0018	0.0640
06-083	7.64	40	< 2	34.0	< 2	< 0.0001	0.27	0.42	< 0.0001	0.26	< 0.0004	< 0.00002	16.00	< 0.00006	0.00003	< 0.001	0.0003	0.05	< 0.002	15.20	3.59	0.0568	0.0006	6.42	< 0.0007	0.0007	< 0.01	0.0022	18.10	< 0.003	0.0306	0.0017	0.0010	0.0013	0.0523
COMPOSITE																																			
06-027	7.78	32	< 2	8.4	2.2	< 0.0001	0.37	0.10	< 0.0001	0.34	< 0.0004	< 0.00002	7.73	< 0.00006	0.00005	< 0.001	0.0003	0.05	< 0.002	7.89	1.28	0.0018	0.0007	6.77	0.0013	0.0010	0.03	0.0038	3.81	< 0.003	0.0262	0.0025	0.0012	0.0003	0.0081
06-035	7.85	30	< 2	46.0	2.3	< 0.0001	0.20	0.02	< 0.0001	0.14	< 0.0004	< 0.00002	21.90	< 0.00006	0.00001	< 0.001	0.0003	< 0.01	< 0.002	8.62	2.03	0.0124	0.0005	6.34	0.0010	0.0004	< 0.01	0.0009	21.10	< 0.003	0.0566	0.0006	0.0003	0.0004	0.0070
06-052	7.65	31	< 2	27.0	< 2	< 0.0001	0.23	0.04	< 0.0001	0.22	< 0.0004	< 0.00002	11.60	< 0.00006	0.00004	< 0.001	0.0004	0.02	< 0.002	10.00	1.95	0.0037	0.0013	9.12	0.0015	0.0007	< 0.01	0.0028	13.10	< 0.003	0.0310	0.0013	0.0007	0.0003	0.0071
06-059	8.03	29	< 2	36.0	< 2	< 0.0001	0.23	0.05	< 0.0001	0.15	< 0.0004	< 0.00002	17.10	< 0.00006	0.00004	< 0.001	0.0002	< 0.01	< 0.002	7.80	2.22	0.0060	0.0004	5.69	0.0009	0.0007	< 0.01	0.0018	15.20	< 0.003	0.0584	0.0009	0.0006	0.0003	0.0060
06-070	7.73	39	< 2	35.0	2.3	< 0.0001	0.37	0.07	< 0.0001	0.26	< 0.0004	< 0.00002	15.30	< 0.00006	0.00017	< 0.001	0.0005	0.13	< 0.002	12.90	2.61	0.0115	0.0010	9.98	0.0024	0.0015	< 0.01	0.0029	14.80	< 0.003	0.0296	0.0055	0.0011	0.0005	0.0524
GREYWACKE (20%-60% ARGILLITE INTERBEDS)																																			
06-001	8.05	56	< 2	66.0	< 2	< 0.0001	0.24	0.00	< 0.0001	0.26	< 0.0004	< 0.00002	10.30	< 0.00006	0.00001	< 0.001	0.0008	0.03	< 0.002	8.75	2.36	0.0105	0.0009	6.81	0.0006	0.0012	0.01	0.0011	8.79	< 0.003	0.0308	0.0009	0.0005	0.0003	0.0046
06-034	8.05	35	< 2	6.0	2.6	< 0.0001	0.31	0.35	< 0.0001	0.35	< 0.0004	< 0.00002	7.77	< 0.00006	0.00001	< 0.001	0.0002	0.04	< 0.002	7.01	0.87	0.0018	0.0011	8.13	< 0.0007	0.0008	< 0.01	0.0017	3.22	< 0.003	0.0299-	0.0035	0.0023	0.0006	0.0066
GREYWACKE (<20% ARGILLITE INTERBEDS)																																			
06-061	7.83	40	< 2	8.7	3.6	< 0.0001	0.68	0.03	< 0.0001	0.49	< 0.0004	< 0.00002	6.86	< 0.00006	0.00020	< 0.001	0.0006	0.24	< 0.002	6.63	1.46	0.0062	0.0004	11.6	< 0.0007	0.0013	< 0.01	0.0013	3.27	< 0.003	0.0270	0.0189	0.0035	0.0013	0.0648
06-065	8.16	38	< 2	8.0	< 2	< 0.0001	0.49	0.04	< 0.0001	0.27	< 0.0004	< 0.00002	8.56	< 0.00006	0.00002	< 0.001	0.0001	0.02	< 0.002	9.61	1.00	0.0019	0.0008	6.85	< 0.0007	0.0005	< 0.01	0.0015	4.16	< 0.003	0.0301	0.0012	0.0025	0.0006	0.0060
06-066	7.58	38	< 2	28.0	2.8	< 0.0001	0.39	0.21	< 0.0001	0.30	< 0.0004	< 0.00002	13.70	< 0.00006	0.00007	< 0.001	0.0004	0.11	< 0.002	11.50	2.62	0.0112	0.0014	10.8	0.0007	0.0007	< 0.01	0.0032	14.00	< 0.003	0.0352	0.0057	0.0014	0.0010	0.0612
MARGINAL ORE																																			
06-008	7.65	27	< 2	67.0	< 2	< 0.0001	0.17	0.04	< 0.0001	0.13	< 0.0004	< 0.00002	26.40	< 0.00006	0.00004	< 0.001	0.0005	< 0.01	< 0.002	9.44	3.44	0.0629	0.0004	7.52	0.0035	0.0005	< 0.01	0.0010	26.30	< 0.003	0.0437	0.0011	0.0003	0.0004	0.0076
06-088	7.75	37	< 2	9.0	< 2	< 0.0001	0.32	0.08	< 0.0001	0.30	< 0.0004	< 0.00002	5.96	< 0.00006	< 0.000007	< 0.001	0.0002	0.01	< 0.002	9.08	1.44	0.0011	0.0008	3.96	< 0.0007	0.0008	< 0.01	0.0011	5.21	< 0.003	0.0232	0.0005	0.0007	0.0003	0.0034
06-090	7.81	42	< 2	10.0	< 2	< 0.0001	1.26	0.06	< 0.0001	0.49	< 0.0004	< 0.00002	8.61	< 0.00006	0.00028	< 0.001	0.0004	0.57	< 0.002	10.40	1.24	0.0074	0.0003	7.88	0.0012	0.0008	< 0.01	0.0013	4.77	< 0.003	0.0208	0.0308	0.0022	0.0005	0.0895

APPENDIX B

KINETIC TEST RESULTS

Appendix B-1
HUMIDITY CELL RESULTS FOR HC 06-06
Argillite (<5% Greywacke)

S-Total: 0.219 %
S^{2-}: 0.2 %
NP: 33.00 t $CaCO_3$/1000 t
CaNP: 24.68 t $CaCO_3$/1000 t
AP: 5.6 t $CaCO_3$/1000 t
Weight: 1000 g

Weeks	#	CCME Guideline *	MMER Guideline **	0	1	2	3	4	5	6	7	8
Date				09-Jan-07	16-Jan-07	23-Jan-07	30-Jan-07	06-Feb-07	13-Feb-07	20-Feb-07	27-Feb-07	06-Mar-07
Leachate	mL	—	—	775	946	962	855	836	866	880	832	967
pH	pH	6.5 - 9	6.0 - 9.5	8.02	7.98	7.92	8.13	8.07	7.64	7.62	8.11	7.97
Conductivity	µS/cm	—	—	216	150	59	48	41	67	28	45	78
Alkalinity	mg/L as CaCO3	—	—	22	34	21	15	13	22	10	16	31
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	55	27	4.6	4	3.9	6.6	2.1	3.1	6.7
Calcium (Ca)	mg/L	—	—	11.8	11.9	7.12	5.49	5.02	7.65	4.28	8.38	11.6
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001			
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003			
Aluminium (Al)	mg/L	0.1	—	0.132	0.182	0.11			0.12			
Arsenic (As)	mg/L	0.005	1	0.0142	0.0481	0.0213			0.0307			
Barium (Ba)	mg/L	—	—	0.00234	0.00164	0.00051			0.00062			
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004			
Boron (B)	mg/L	—	—	0.007	0.012	0.004			0.002			
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002			
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006			
Cobalt (Co)	mg/L	—	—	0.000159	0.000094	0.000038			< 0.000007			
Chromium (Cr)	mg/L	0.0089	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003			
Copper (Cu)	mg/L	0.002	0.6	0.0009	0.0003	0.0001			< 0.0001			
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002			
Potassium (K)	mg/L	—	—	17.4	10.3	2.95			3.04			
Magnesium (Mg)	mg/L	—	—	3.2	2.63	0.884			1.13			
Manganese (Mn)	mg/L	—	—	0.013	0.0104	0.0248			0.0245			
Molybdenum (Mo)	mg/L	0.073	—	0.0098	0.0023	0.00049			0.0003			
Sodium (Na)	mg/L	—	—	12.6	4.84	0.52			0.26			
Nickel (Ni)	mg/L	0.025	1	0.0035	0.0042	< 0.0007			< 0.0007			
Phosphorous (P)	mg/L	—	—	< 0.01	0.02	< 0.01			< 0.01			
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	0.00003	< 0.00002			< 0.00002			
Antimony (Sb)	mg/L	—	—	0.0022	0.0053	0.0027			0.0035			
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001			
Tin (Sn)	mg/L	—	—	0.0025	0.0017	0.0008			< 0.0003			
Strontium (Sr)	mg/L	—	—	0.0371	0.0335	0.0157			0.0195			
Titanium (Ti)	mg/L	—	—	0.0008	< 0.0002	< 0.0002			< 0.0002			
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001			
Uranium (U)	mg/L	—	—	0.00015	0.00019	0.00002			0.00004			
Vanadium (V)	mg/L	—	—	0.00025	0.00031	0.0002			0.00028			
Yttrium (Y)	mg/L	—	—	0.000007	0.000013	0.000015			0.000008			
Tungsten (W)	mg/L	—	—	0.0001	0.00012	0.00028			0.00033			
Zinc (Zn)	mg/L	0.03	1	0.0007	0.0007	0.0003			0.0005			

Weeks	9	10	11	12	13	14	15	16
Date	13-Mar-07	20-Mar-07	27-Mar-07	03-Apr-07	10-Apr-07	17-Apr-07	24-Apr-07	01-May-07
Leachate	953	896	978	917	944	884	884	870
pH	7.66	7.71	8.05	7.71	7.78	7.85	8.04	7.76
Conductivity	75	53	72	54	67	64	47	63
Alkalinity	31	23	30	24	27	24	21	26
Acidity	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	3.9	3.1	5	3.8	4.6	4.3	3.7	5.3
Calcium (Ca)	10.4	8.59	12.9	9.59	11.4	9.99	7.8	10.6
Iron (Fe)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)		< 0.0001					< 0.0001	
Silver (Ag)		< 0.00003					< 0.00003	
Aluminium (Al)		0.126					0.121	
Arsenic (As)		0.0267					0.0228	
Barium (Ba)		0.00036					0.00022	
Beryllium (Be)		< 0.00004					< 0.00004	
Boron (B)		< 0.002					< 0.002	
Bismuth (Bi)		< 0.00002					< 0.00002	
Cadmium (Cd)		< 0.00006					< 0.00006	
Cobalt (Co)		< 0.000007					0.000026	
Chromium (Cr)		< 0.0003					< 0.0003	
Copper (Cu)		0.0002					< 0.0001	
Lithium (Li)		< 0.002					< 0.002	
Potassium (K)		0.82					0.4	
Magnesium (Mg)		0.625					0.383	
Manganese (Mn)		0.0313					0.0199	
Molybdenum (Mo)		< 0.00005					< 0.00005	
Sodium (Na)		0.05					0.03	
Nickel (Ni)		< 0.0007					< 0.0007	
Phosphorous (P)		< 0.01					< 0.01	
Lead (Pb)		< 0.00002					< 0.00002	
Antimony (Sb)		0.002					0.0005	
Selenium (Se)		< 0.001					< 0.001	
Tin (Sn)		< 0.0003					< 0.0003	
Strontium (Sr)		0.0174					0.0153	
Titanium (Ti)		< 0.0002					< 0.0002	
Thallium (Tl)		< 0.0001					< 0.0001	
Uranium (U)		0.00005					0.00003	
Vanadium (V)		0.00027					0.00025	
Yttrium (Y)		< 0.000005					< 0.000005	
Tungsten (W)		< 0.00007					< 0.00007	
Zinc (Zn)		0.0009					< 0.0003	

Weeks	17	18	19	20	21	22	23	24
Date	08-May-07	15-May-07	22-May-07	29-May-07	05-Jun-07	12-Jun-07	19-Jun-07	26-Jun-07
Leachate	904	904	944	950	845	807	814	844
pH	7.11	7.54	7.47	7.48	7.33	7.97	7.57	7.51
Conductivity	40	72	46	35	45	98	48	35
Alkalinity	16	27	30	13	10	39	13	11
Acidity	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	2.7	7.2	3.4	3	4.5	9.1	1.5	3.3
Calcium (Ca)	6.94	9.35	8.26	6.89	5.83	10.4	5.37	5.77
Iron (Fe)	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)				< 0.0001				
Silver (Ag)				< 0.00003				
Aluminium (Al)				0.079				
Arsenic (As)				0.0138				
Barium (Ba)				0.00018				
Beryllium (Be)				< 0.00004				
Boron (B)				< 0.002				
Bismuth (Bi)				< 0.00002				
Cadmium (Cd)				< 0.00006				
Cobalt (Co)				0.000018				
Chromium (Cr)				< 0.0003				
Copper (Cu)				0.0004				
Lithium (Li)				< 0.002				
Potassium (K)				0.19				
Magnesium (Mg)				0.26				
Manganese (Mn)				0.036				
Molybdenum (Mo)				0.00007				
Sodium (Na)				0.02				
Nickel (Ni)				< 0.0007				
Phosphorous (P)				< 0.01				
Lead (Pb)				0.00002				
Antimony (Sb)				0.0013				
Selenium (Se)				< 0.001				
Tin (Sn)				< 0.0003				
Strontium (Sr)				0.0138				
Titanium (Ti)				< 0.0002				
Thallium (Tl)				< 0.0001				
Uranium (U)				< 0.00002				
Vanadium (V)				0.00013				
Yttrium (Y)				0.000005				
Tungsten (W)				< 0.00007				
Zinc (Zn)				0.001				

* : Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1999
** : Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002.
1 Value is above CCME Guidelines
Value is above MMER Guidelines

Appendix B-1
HUMIDITY CELL RESULTS FOR HC 06-017
Argillite (<5% Greywacke

S-Total: 0.028 %
S^{2-}: 0.0 %
NP: 20.10 t $CaCO_3$/1000 t
CaNP: 15.34 t $CaCO_3$/1000 t
AP: 0.9 t $CaCO_3$/1000 t
Weight: 1000 g

Weeks Date	#	CCME Guideline *	MMER Guideline **	0 09-Jan-07	1 16-Jan-07	2 23-Jan-07	3 30-Jan-07	4 06-Feb-07	5 13-Feb-07	6 20-Feb-07	7 27-Feb-07	8 06-Mar-07	9 13-Mar-07	10 20-Mar-07	11 27-Mar-07	12 03-Apr-07	13 10-Apr-07	14 17-Apr-07	15 24-Apr-07	16 01-May-07	17 08-May-07	18 15-May-07	19 22-May-07	20 29-May-07	21 05-Jun-07	22 12-Jun-07	23 19-Jun-07	24 26-Jun-07
Leachate	mL	—	—	749	988	994	986	993	993	990	992	990	988	972	980	974	983	991	954	991	953	999	952	974	934	876	912	894
pH	pH	6.5 - 9	6.0 - 9.5	7.89	7.68	7.59	7.6	7.48	7.48	7.66	7.53	7.3	7.23	7.09	7.3	7.09	7.06	7.53	7.47	7.76	7.11	7.28	7.48	7.42	7.4	7.8	7.34	7.5
Conductivity	µS/cm	—	—	157	51	40	38	34	26	39	36	20	23	19	20	18	27	32	28	28	33	32	42	37	52	42	47	30
Alkalinity	mg/L as CaCO3	—	—	17	16	15	14	13	11	16	28	8	7	7	7	7	7	11	13	8	12	13	20	16	13	18	13	13
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	35	2.8	2	1.4	1	0.7	1.1	1.1	0.8	0.9	0.9	1	0.8	1.2	1.2	1	0.9	1	0.9	1.2	0.8	6.1	0.7	0.6	0.6
Calcium (Ca)	mg/L	—	—	10.1	3.63	3.4	3.19	3.5	2.89	4.74	4.17	2.46	2.41	2.67	2.69	2.65	3.37	3.89	3.78	3.44	4.85	4.8	6.3	6.41	5.72	7.01	4.81	4.73
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003					< 0.00003					< 0.00003					< 0.00003				
Aluminum (Al	mg/L	0.1	—	0.0523	0.0565	0.0523			0.0469					0.0146					0.0335					0.078				
Arsenic (As)	mg/L	0.005	1	0.118	0.111	0.124			0.126					0.136					0.233					0.658				
Barium (Ba)	mg/L	—	—	0.00192	0.00058	0.00058			0.00048					0.0003					0.00035					0.00063				
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004					< 0.00004					< 0.00004					< 0.00004				
Boron (B)	mg/L	—	—	0.004	0.005	0.003			< 0.002					< 0.002					< 0.002					< 0.002				
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002					< 0.00002					< 0.00002					< 0.00002				
Cadmium (Cd	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00008					< 0.00006					< 0.00008					< 0.00008				
Cobalt (Co)	mg/L	—	—	0.000051	0.0001	0.00011			0.000023					0.000142					0.000327					0.000263				
Chromium (Cr	mg/L	0.0089		< 0.0003	< 0.0003	< 0.0003			< 0.0003					< 0.0003					< 0.0003					< 0.0003				
Copper (Cu)	mg/L	0.002	0.6	0.0002	< 0.0001	0.0002			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002					< 0.002					< 0.002					< 0.002				
Potassium (K)	mg/L	—	—	13.8	3.44	3.01			2.05					0.92					1					1.15				
Magnesium (Mg	mg/L	—	—	3.24	0.549	0.526			0.431					0.382					0.458					0.66				
Manganese (Mn)	mg/L	—	—	0.0378	0.0186	0.0161			0.015					0.011					0.0139					0.013				
Molybdenum (Mo	mg/L	0.073	—	0.00068	0.00075	0.00061			< 0.00005					< 0.00005					< 0.00005					0.00013				
Sodium (Na)	mg/L	—	—	4.9	2.44	1.68			0.53					0.07					0.05					0.06				
Nickel (Ni)	mg/L	0.025	1	0.0014	< 0.0007	< 0.0007			< 0.0007					< 0.0007					< 0.0007					< 0.0007				
Phosphorous (P)	mg/L	—	—	< 0.01	0.04	< 0.01			< 0.01					< 0.01					< 0.01					< 0.01				
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	< 0.00002	< 0.00002			< 0.00002					< 0.00002					< 0.00002					< 0.00002				
Antimony (Sb)	mg/L	—	—	0.0021	0.0066	0.0066			0.0048					0.0028					0.0039					0.0084				
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001					< 0.001					< 0.001					< 0.001				
Tin (Sn)	mg/L	—	—	0.003	0.0015	0.0011			< 0.0003					< 0.0003					< 0.0003					0.0004				
Strontium (Sr)	mg/L	—	—	0.037	0.0138	0.0128			0.0114					0.009					0.0125					0.0198				
Titanium (Ti)	mg/L	—	—	0.0006	< 0.0002	0.0003			< 0.0002					< 0.0002					< 0.0002					< 0.0002				
Thallium (Tl	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Uranium (U	mg/L	—	—	0.00009	0.00026	0.00023			0.00022					0.00007					0.00034					0.00041				
Vanadium (V	mg/L	—	—	0.00029	0.00041	0.00041			0.00036					0.00015					0.00039					0.00066				
Yttrium (Y)	mg/L	—	—	< 0.000005	0.000012	0.000006			< 0.000005					< 0.000005					< 0.000005					< 0.000005				
Tungsten (W)	mg/L	—	—	0.00036	0.00008	0.00025			0.00026					< 0.00007					< 0.00007					< 0.00007				
Zinc (Zn)	mg/L	0.03	1	0.0004	< 0.0003	0.0018			0.0011					0.001					< 0.0003					0.0004				

* Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1999.
** : Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-1
HUMIDITY CELL RESULTS FOR HC 06-04I
Argillite (<5% Greywacke

S-Total: 0.288 %
S^{2-}: 0.2 %
NP: 29.20 t $CaCO_3$/1000 t
CaNP: 25.18 t $CaCO_3$/1000 t
AP: 6.9 t $CaCO_3$/1000 t
Weight: 1000 g

Weeks / Date	#	CCME Guideline *	MMER Guideline **	0 09-Jan-07	1 16-Jan-07	2 23-Jan-07	3 30-Jan-07	4 06-Feb-07	5 13-Feb-07	6 20-Feb-07	7 27-Feb-07	8 06-Mar-07	9 13-Mar-07	10 20-Mar-07	11 27-Mar-07
Leachate	mL	—	—	778	926	977	887	839	876	881	884	920	861	915	828
pH	pH	6.5 - 9	6.0 - 9.5	8.01	8.08	8.01	7.79	7.92	7.59	7.64	7.8	7.74	7.68	7.56	7.91
Conductivity	µS/cm	—	—	182	177	77	35	41	61	37	47	42	41	41	50
Alkalinity	mg/L as CaCO3	—	—	18	37	29	12	13	16	13	16	15	16	14	18
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	41	35	5.7	2.2	3.4	7.4	3.4	5.1	3.6	2.8	3.7	4.9
Calcium (Ca)	mg/L	—	—	9.56	11.3	8.63	3.96	5.16	8.41	5.45	8.43	5.84	5.65	6.05	6.09
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001	
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003					< 0.00003	
Aluminum (Al)	mg/L	0.1	—	0.106	0.162	0.162			0.131					0.117	
Arsenic (As)	mg/L	0.005	1	0.004	0.0168	0.0123			0.0115					0.0111	
Barium (Ba)	mg/L	—	—	0.00183	0.00239	0.00097			0.00057					0.00038	
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004					< 0.00004	
Boron (B)	mg/L	—	—	0.005	0.014	0.006			< 0.002					< 0.002	
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002					< 0.00002	
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006					< 0.00008	
Cobalt (Co)	mg/L	—	—	0.000144	0.000138	0.00005			< 0.000007					< 0.000007	
Chromium (Cr)	mg/L	0.0089	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003					< 0.0003	
Copper (Cu)	mg/L	0.002	0.6	0.0011	0.0008	0.0003			0.0002					0.0002	
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002					< 0.002	
Potassium (K)	mg/L	—	—	14.3	13.9	4.92			1.98					0.78	
Magnesium (Mg)	mg/L	—	—	2.5	3.22	1.52			1.04					0.652	
Manganese (Mn)	mg/L	—	—	0.0245	0.021	0.0211			0.023					0.0266	
Molybdenum (Mo)	mg/L	0.073	—	0.00035	0.00087	0.00036			< 0.00005					< 0.00005	
Sodium (Na)	mg/L	—	—	10.9	6.64	0.61			0.22					0.07	
Nickel (Ni)	mg/L	0.025	1	0.0017	0.0035	< 0.0007			< 0.0007					< 0.0007	
Phosphorous (P)	mg/L	—	—	< 0.01	< 0.01	< 0.01			< 0.01					< 0.01	
Lead (Pb)	mg/L	0.001	0.4	< 0.00002	0.00007	< 0.00002			< 0.00002					< 0.00002	
Antimony (Sb)	mg/L	—	—	0.0023	0.0078	0.0057			0.0027					0.002	
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001					< 0.001	
Tin (Sn)	mg/L	—	—	0.0031	0.0023	0.0011			0.0004					0.0006	
Strontium (Sr)	mg/L	—	—	0.0308	0.0371	0.0201			0.0144					0.0111	
Titanium (Ti)	mg/L	—	—	0.0006	0.0002	0.0002			< 0.0002					< 0.0002	
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001	
Uranium (U)	mg/L	—	—	0.0001	0.00027	0.00007			0.00006					0.00007	
Vanadium (V)	mg/L	—	—	0.00019	0.00031	0.00032			0.00023					0.00022	
Yttrium (Y)	mg/L	—	—	0.000005	0.000014	0.000014			0.000005					< 0.000005	
Tungsten (W)	mg/L	—	—	0.0002	0.00033	0.00047			0.00049					0.00009	
Zinc (Zn)	mg/L	0.03	1	0.0007	0.0014	0.0007			0.0008					0.0007	

Weeks / Date	12 03-Apr-07	13 10-Apr-07	14 17-Apr-07	15 24-Apr-07	16 01-May-07	17 08-May-07	18 15-May-07	19 22-May-07	20 29-May-07	21 05-Jun-07	22 12-Jun-07	23 19-Jun-07	24 26-Jun-07
Leachate	951	850	888	849	951	916	936	912	958	824	820	878	854
pH	7.62	7.4	7.88	7.72	7.71	7.19	7.39	7.53	7.67	7.67	7.83	7.48	7.4
Conductivity	43	27	56	53	68	50	59	50	76	69	63	48	28
Alkalinity	16	9	20	15	28	20	22	21	31	25	25	12	9
Acidity	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	3.8	1.9	5.1	4.4	5.8	3.8	5.5	4.7	8.2	3.8	5	2.5	2
Calcium (Ca)	7.23	3.04	8.51	8.64	9.87	7.95	2.48	8.41	13.9	9.85	11.5	5.54	4.12
Iron (Fe)	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02
Mercury (Hg)				< 0.0001					< 0.0001				
Silver (Ag)				< 0.00003					< 0.00003				
Aluminum (Al)				0.111					0.141				
Arsenic (As)				0.0133					0.0276				
Barium (Ba)				0.00031					0.00058				
Beryllium (Be)				< 0.00004					< 0.00004				
Boron (B)				< 0.002					0.003				
Bismuth (Bi)				< 0.00002					< 0.00002				
Cadmium (Cd)				< 0.00006					< 0.00006				
Cobalt (Co)				0.000032					0.000064				
Chromium (Cr)				< 0.0003					< 0.0003				
Copper (Cu)				0.0002					0.0001				
Lithium (Li)				< 0.002					< 0.002				
Potassium (K)				0.59					0.68				
Magnesium (Mg)				0.681					1.12				
Manganese (Mn)				0.0246					0.0391				
Molybdenum (Mo)				< 0.00005					0.00012				
Sodium (Na)				0.05					0.07				
Nickel (Ni)				< 0.0007					< 0.0007				
Phosphorous (P)				< 0.01					< 0.01				
Lead (Pb)				< 0.00002					< 0.00002				
Antimony (Sb)				0.0012					0.0043				
Selenium (Se)				< 0.001					< 0.001				
Tin (Sn)				< 0.0003					0.0005				
Strontium (Sr)				0.0118					0.0244				
Titanium (Ti)				< 0.0002					< 0.0002				
Thallium (Tl)				< 0.0001					< 0.0001				
Uranium (U)				0.00004					0.0003				
Vanadium (V)				0.00021					0.00026				
Yttrium (Y)				< 0.000006					0.000007				
Tungsten (W)				< 0.00007					0.00014				
Zinc (Zn)				< 0.0003					0.001				

* Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1999
** : Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II 2002
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-1
HUMIDITY CELL RESULTS FOR HC 06-875
Argillite (<5% Greywacke

S-Total: 1.2 %
S^{2-}: 0.5 %
NP: 28.80 t $CaCO_3$/1000 t
CaNP: 32.69 t $CaCO_3$/1000 t
AP: 15.9 t $CaCO_3$/1000 t
Weight: 1000 g

Weeks / Date	#	CCME Guideline *	MMER Guideline **	0 09-Jan-07	1 16-Jan-07	2 23-Jan-07	3 30-Jan-07	4 06-Feb-07	5 13-Feb-07	6 20-Feb-07	7 27-Feb-07	8 06-Mar-07	9 13-Mar-07	10 20-Mar-07	11 27-Mar-07	12 03-Apr-07	13 10-Apr-07	14 17-Apr-07	15 24-Apr-07	16 01-May-07	17 08-May-07	18 15-May-07	19 22-May-07	20 29-May-07	21 05-Jun-07	22 12-Jun-07	23 19-Jun-07	24 26-Jun-07
Leachate	mL	—	—	788	928	953	997	950	935	910	991	990	956	958	986	947	995	996	987	981	978	946	910	944	934	967	951	968
pH	pH	6.5 - 9	6.0 - 9.5	7.53	7.4	7.39	7.59	7.25	7.33	7.05	7.06	7.24	7.07	7.08	7.37	7.2	7.22	7.36	7.31	7.27	6.95	6.95	7.09	7.33	7.4	7.48	7.24	7.42
Conductivity	µS/cm	—	—	165	80	55	57	32	28	20	24	27	31	26	30	31	32	37	33	42	30	26	30	30	32	45	44	47
Alkalinity	mg/L as CaCO3	—	—	12	14	12	16	9	7	5	7	10	6	7	8	9	10	9	6	13	8	8	12	12	13	14	9	14
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	6.1	14	8.5	5.8	4.1	4.3	3.1	3.1	4	6.6	3.6	4.2	4.6	4.1	4.6	4.8	5.4	3.6	3.8	4.3	6.1	6.1	5.7	3.6	6.4
Calcium (Ca)	mg/L	—	—	13.5	5.41	4.41	5.09	3.19	2.68	1.87	2.62	3.11	2.79	3.31	3.82	4.01	3.96	4.16	3.81	5.1	3.58	4.72	3.79	5.68	5.72	6.4	3.62	6.34
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003					< 0.00003					< 0.00003					< 0.00003				
Aluminum (Al	mg/L	0.1	—	0.0931	0.0368	0.0279			0.0404					0.017					0.03					0.048				
Arsenic (As)	mg/L	0.005	1	0.0698	0.106	0.0625			0.0598					0.0341					0.04					0.0626				
Barium (Ba)	mg/L	—	—	0.00193	0.00094	0.00065			0.00031					0.00025					0.00042					0.00034				
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004					< 0.00004					< 0.00004					< 0.00004				
Boron (B)	mg/L	—	—	0.005	0.005	0.003			< 0.002					< 0.002					< 0.002					< 0.002				
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002					< 0.00002					< 0.00002					< 0.00002				
Cadmium (Cd	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006					< 0.00006					< 0.00006					< 0.00006				
Cobalt (Co)	mg/L	—	—	0.000256	0.000026	0.000022			< 0.000007					< 0.000007					0.000015					0.000013				
Chromium (Cr	mg/L	0.0099	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003					< 0.0003					< 0.0003					< 0.0003				
Copper (Cu)	mg/L	0.002	0.6	< 0.0001	0.0002	0.0001			0.0004					< 0.0001					< 0.0001					0.0002				
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002					< 0.002					< 0.002					< 0.002				
Potassium (K)	mg/L	—	—	8.19	6.17	3.8			1.53					0.71					0.72					0.74				
Magnesium (Mg)	mg/L	—	—	1.73	1.6	1.36			0.75					0.777					0.858					1.26				
Manganese (Mn)	mg/L	—	—	0.103	0.0158	0.0149			0.0133					0.0192					0.0219					0.0302				
Molybdenum (Mo	mg/L	0.073	—	0.00118	0.00159	0.00122			< 0.00005					< 0.00005					< 0.00005					0.00017				
Sodium (Na)	mg/L	—	—	6.28	1.73	0.68			0.12					0.04					0.04					0.04				
Nickel (Ni)	mg/L	0.025	1	0.0022	0.0008	< 0.0007			< 0.0007					< 0.0007					< 0.0007					< 0.0007				
Phosphorous (P)	mg/L	—	—	0.02	< 0.01	< 0.01			< 0.01					0.01					< 0.01					< 0.01				
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	< 0.00002	< 0.00002			0.0001					< 0.00002					0.00003					< 0.00002				
Antimony (Sb)	mg/L	—	—	0.004	0.0035	0.0037			0.0023					0.0017					0.0013					0.0038				
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001					< 0.001					< 0.001					< 0.001				
Tin (Sn)	mg/L	—	—	0.0037	0.001	0.0007			< 0.0003					< 0.0003					< 0.0003					< 0.0003				
Strontium (Sr)	mg/L	—	—	0.053	0.0197	0.0151			0.0061					0.0084					0.0094					0.0133				
Titanium (Ti)	mg/L	—	—	< 0.0002	< 0.0002	< 0.0002			< 0.0002					< 0.0002					< 0.0002					< 0.0002				
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Uranium (U	mg/L	—	—	0.00021	0.00012	0.00011			0.00005					< 0.00002					0.00008					0.00004				
Vanadium (V	mg/L	—	—	0.00052	0.00018	0.00012			0.00011					0.00007					0.00009					0.00011				
Yttrium (Y)	mg/L	—	—	0.000006	< 0.000005	0.000006			< 0.000005					< 0.000005					< 0.000005					< 0.000005				
Tungsten (W)	mg/L	—	—	0.00018	0.00024	0.00035			0.00029					< 0.00007					< 0.00007					< 0.00007				
Zinc (Zn)	mg/L	0.03	1	< 0.0003	< 0.0003	0.003			0.0005					0.0004					0.0035					0.0015				

* Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1999
** Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-2
HUMIDITY CELL RESULTS FOR HC 06-061
Greywacke (<20% Argillite Interbeds)

S-Total:	0.081 %
S^{2-}:	0.1 %
NP:	36.00 t $CaCO_3$/1000 t
CaNP:	26.19 t $CaCO_3$/1000 t
AP:	2.5 t $CaCO_3$/1000 t
Weight:	1000 g

Weeks / Date	#	CCME Guideline *	MMER Guideline **	0 / 09-Jan-07	1 / 16-Jan-07	2 / 23-Jan-07	3 / 30-Jan-07	4 / 06-Feb-07	5 / 13-Feb-07	6 / 20-Feb-07	7 / 27-Feb-07	8 / 06-Mar-07
Leachate	mL	—	—	805	954	988	990	997	952	928	941	944
pH	pH	6.5 - 9	6.0 - 9.5	8.17	8.16	8.32	8.13	7.98	7.58	7.91	7.74	7.44
Conductivity	µS/cm	—	—	188	108	57	53	52	59	60	52	1
Alkalinity	mg/L as CaCO3	—	—	22	31	21	21	21	21	22	17	12
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	32	16	3.2	2	2.1	4	5.7	5.4	3
Calcium (Ca)	mg/L	—	—	8.98	8.3	5.84	5.94	5.09	7.26	9.29	7.55	5.54
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001			
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003			
Aluminum (Al)	mg/L	0.1	—	0.102	0.0949	0.09			0.0982			
Arsenic (As)	mg/L	0.005	1	0.0279	0.0625	0.0451			0.0774			
Barium (Ba)	mg/L	—	—	0.00169	0.00129	0.00118			0.00098			
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004			
Boron (B)	mg/L	—	—	0.007	0.012	0.006			< 0.002			
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002			
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006			
Cobalt (Co)	mg/L	—	—	0.000119	0.00009	0.00005			< 0.000007			
Chromium (Cr)	mg/L	0.0089	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003			
Copper (Cu)	mg/L	0.002	0.6	0.0004	0.0003	0.0007			0.0003			
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002			
Potassium (K)	mg/L	—	—	10.3	7.43	3.39			2.36			
Magnesium (Mg)	mg/L	—	—	1.27	1.13	0.578			0.656			
Manganese (Mn)	mg/L	—	—	0.0246	0.0262	0.0247			0.0267			
Molybdenum (Mo)	mg/L	0.073	—	0.00221	0.00229	0.00081			0.00036			
Sodium (Na)	mg/L	—	—	13.4	6.22	1.55			0.51			
Nickel (Ni)	mg/L	0.025	1	0.0013	0.0009	< 0.0007			< 0.0007			
Phosphorous (P)	mg/L	—	—	0.01	0.02	< 0.01			< 0.01			
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	0.00006	< 0.00002			0.00017			
Antimony (Sb)	mg/L	—	—	0.122	1.16	1.01			0.705			
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001			
Tin (Sn)	mg/L	—	—	0.003	0.0014	0.0008			< 0.0003			
Strontium (Sr)	mg/L	—	—	0.0242	0.0206	0.0122			0.0154			
Titanium (Ti)	mg/L	—	—	0.0005	0.0002	0.0002			< 0.0002			
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001			
Uranium (U)	mg/L	—	—	0.00086	0.0011	0.00034			0.00132			
Vanadium (V)	mg/L	—	—	0.00052	0.00056	0.00058			0.00066			
Yttrium (Y)	mg/L	—	—	0.000006	0.000018	0.000023			0.000018			
Tungsten (W)	mg/L	—	—	0.00035	0.00058	0.0005			0.00025			
Zinc (Zn)	mg/L	0.03	1	0.001	0.0006	0.0007			0.0008			

Weeks / Date	9 / 13-Mar-07	10 / 20-Mar-07	11 / 27-Mar-07	12 / 03-Apr-07	13 / 10-Apr-07	14 / 17-Apr-07	15 / 24-Apr-07	16 / 01-May-07
Leachate	896	970	950	990	939	983	877	954
pH	7.55	7.81	7.98	7.9	7.57	7.8	7.83	7.87
Conductivity	50	62	55	47	43	50	48	61
Alkalinity	14	23	24	18	15	17	17	29
Acidity	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	6.3	5.5	4.6	3	2.9	3.5	4.1	4.3
Calcium (Ca)	6.87	9.61	9.87	8.21	7.1	8.05	7.86	10.1
Iron (Fe)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)		< 0.0001					< 0.0001	
Silver (Ag)		< 0.00003					< 0.00003	
Aluminum (Al)		0.172					0.124	
Arsenic (As)		0.111					0.0892	
Barium (Ba)		0.00078					0.00046	
Beryllium (Be)		< 0.00004					< 0.00004	
Boron (B)		< 0.002					< 0.002	
Bismuth (Bi)		< 0.00002					< 0.00002	
Cadmium (Cd)		< 0.00006					< 0.00006	
Cobalt (Co)		< 0.000007					0.000062	
Chromium (Cr)		< 0.0003					< 0.0003	
Copper (Cu)		0.0002					< 0.0001	
Lithium (Li)		< 0.002					< 0.002	
Potassium (K)		1.21					0.7	
Magnesium (Mg)		0.644					0.381	
Manganese (Mn)		0.0187					0.0197	
Molybdenum (Mo)		0.00116					0.00022	
Sodium (Na)		0.22					0.14	
Nickel (Ni)		< 0.0007					< 0.0007	
Phosphorous (P)		0.01					< 0.01	
Lead (Pb)		< 0.00002					< 0.00002	
Antimony (Sb)		0.507					0.358	
Selenium (Se)		< 0.001					< 0.001	
Tin (Sn)		0.0003					< 0.0003	
Strontium (Sr)		0.0176					0.0137	
Titanium (Ti)		0.0002					< 0.0002	
Thallium (Tl)		< 0.0001					< 0.0001	
Uranium (U)		0.00219					0.00114	
Vanadium (V)		0.00076					0.00051	
Yttrium (Y)		0.000014					0.000008	
Tungsten (W)		0.00012					< 0.00007	
Zinc (Zn)		0.0005					< 0.0003	

Weeks / Date	17 / 08-May-07	18 / 15-May-07	19 / 22-May-07	20 / 29-May-07	21 / 05-Jun-07	22 / 12-Jun-07	23 / 19-Jun-07	24 / 26-Jun-07
Leachate	980	980	984	976	979	966	993	856
pH	7.41	7.57	7.64	7.64	7.63	7.66	7.7	7.73
Conductivity	56	60	48	49	59	50	71	46
Alkalinity	23	24	23	22	22	22	23	20
Acidity	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	3.6	3.8	2.8	3.1	3.1	2.8	2.9	2.6
Calcium (Ca)	9.42	10.4	8.65	8.62	8.92	9.24	9.42	8.48
Iron (Fe)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)				< 0.0001				
Silver (Ag)				< 0.00003				
Aluminum (Al)				0.245				
Arsenic (As)				0.195				
Barium (Ba)				0.0006				
Beryllium (Be)				< 0.00004				
Boron (B)				< 0.002				
Bismuth (Bi)				< 0.00002				
Cadmium (Cd)				< 0.00006				
Cobalt (Co)				0.000041				
Chromium (Cr)				< 0.0003				
Copper (Cu)				0.0002				
Lithium (Li)				< 0.002				
Potassium (K)				0.62				
Magnesium (Mg)				0.344				
Manganese (Mn)				0.00462				
Molybdenum (Mo)				0.00059				
Sodium (Na)				0.15				
Nickel (Ni)				< 0.0007				
Phosphorous (P)				< 0.01				
Lead (Pb)				< 0.00002				
Antimony (Sb)				0.581				
Selenium (Se)				< 0.001				
Tin (Sn)				< 0.0003				
Strontium (Sr)				0.0165				
Titanium (Ti)				< 0.0002				
Thallium (Tl)				< 0.0001				
Uranium (U)				0.00091				
Vanadium (V)				0.00101				
Yttrium (Y)				< 0.000005				
Tungsten (W)				0.00008				
Zinc (Zn)				0.0019				

* Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1999
** Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002

1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-3
HUMIDITY CELL RESULTS FOR HC 06-01:
Argillite (5 - 45% Greywacke)

S-Total: 0.11 %
S^{2-}: 0.1 %
NP: 41.40 t $CaCO_3$/1000 t
CaNP: 32.02 t $CaCO_3$/1000 t
AP: 2.5 t $CaCO_3$/1000 t
Weight: 1000 g

Weeks	#	CCME Guideline *	MMER Guideline **	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Date				09-Jan-07	16-Jan-07	23-Jan-07	30-Jan-07	06-Feb-07	13-Feb-07	20-Feb-07	27-Feb-07	06-Mar-07	13-Mar-07	20-Mar-07	27-Mar-07	03-Apr-07	10-Apr-07	17-Apr-07	24-Apr-07	01-May-07	08-May-07	15-May-07	22-May-07	29-May-07	05-Jun-07	12-Jun-07	19-Jun-07	26-Jun-07
Leachate	mL	--	--	795	812	985	850	831	859	845	848	861	852	899	856	898	850	846	840	863	855	856	859	852	841	858	880	852
pH	pH	6.5 - 9	6.0 - 9.5	7.68	7.69	7.81	8.24	7.58	7.9	8.12	7.78	7.57	7.56	7.11	7.44	7.08	7.4	7.95	7.65	7.14	7.2	7.08	7.12	7.42	7.63	7.55	6.83	7.21
Conductivity	µS/cm	—	—	158	112	46	50	51	29	31	26	26	25	22	23	18	27	29	22	26	26	23	20	23	32	34	42	24
Alkalinity	mg/L as $CaCO_3$	—	—	13	10	13	10	13	10	11	10	9	9	7	7	6	9	9	7	21	22	7	7	10	9	14	5	7
Acidity	mg/L as $CaCO_3$	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	47	31	5.2	7.3	3.8	2.9	2	1.6	2.1	1.2	1.3	1.8	1.6	1.9	1.6	1.2	1.4	1.3	1.3	1.1	1.2	1.6	1.3	1	1.4
Calcium (Ca)	mg/L	—	—	9.57	6.84	4.09	3.39	3.24	2.73	3.3	2.73	2.81	2.47	2.64	2.66	2.14	3.04	3.22	2.44	2.81	3.09	2.27	2.5	3.21	2.7	4.78	1.89	2.48
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003					< 0.00003					< 0.00003					< 0.00003				
Aluminum (Al)	mg/L	0.1	—	0.0416	0.0626	0.064			0.0771					0.0262					0.0368					0.0526				
Arsenic (As)	mg/L	0.005	1	0.0137	0.0156	0.0116			0.0179					0.015					0.0163					0.0221				
Barium (Ba)	mg/L	—	—	0.00143	0.00107	0.00045			0.00032					0.00017					0.00015					0.0002				
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	0.00004			< 0.00004					< 0.00004					< 0.00004					< 0.00004				
Boron (B)	mg/L	—	—	0.004	0.005	0.003			< 0.002					< 0.002					< 0.002					0.002				
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002					< 0.00002					< 0.00002					< 0.00002				
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006					< 0.00006					< 0.00006					< 0.00006				
Cobalt (Co)	mg/L	—	—	0.000159	0.000161	0.000081			< 0.000007					< 0.000007					0.00008					0.000056				
Chromium (Cr)	mg/L	0.0089	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003					< 0.0003					< 0.0003					< 0.0003				
Copper (Cu)	mg/L	0.002	0.6	0.0005	0.0003	0.0006			0.0003					0.0001					< 0.0001					0.0005				
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002					< 0.002					< 0.002					< 0.002				
Potassium (K)	mg/L	—	—	11.6	7.34	2.87			1.91					0.81					0.58					0.56				
Magnesium (Mg)	mg/L	—	—	3.01	2.54	1.11			0.802					0.708					0.597					0.783				
Manganese (Mn)	mg/L	—	—	0.0326	0.0186	0.0233			0.0142					0.0178					0.0162					0.0224				
Molybdenum (Mo)	mg/L	0.073	—	0.00181	0.00258	0.001			0.00031					0.00012					< 0.00006					0.00019				
Sodium (Na)	mg/L	—	—	6.48	3.96	0.84			0.37					0.1					0.06					0.08				
Nickel (Ni)	mg/L	0.025	1	0.0013	0.001	< 0.0007			< 0.0007					< 0.0007					< 0.0007					< 0.0007				
Phosphorous (P)	mg/L	—	—	< 0.01	< 0.01	< 0.01			< 0.01					< 0.01					< 0.01					< 0.01				
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	< 0.00002	< 0.00002			0.00094					< 0.00002					< 0.00002					0.00011				
Antimony (Sb)	mg/L	—	—	0.0038	0.0066	0.0071			0.0054					0.004					0.0032					0.0057				
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001					< 0.001					< 0.001					< 0.001				
Tin (Sn)	mg/L	—	—	0.0029	0.0023	0.0011			0.0003					< 0.0003					< 0.0003					< 0.0003				
Strontium (Sr)	mg/L	—	—	0.028	0.0215	0.0092			0.0085					0.0046					0.0043					0.0052				
Titanium (Ti)	mg/L	—	—	0.0005	< 0.0002	0.0002			< 0.0002					0.0002					< 0.0002					< 0.0002				
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Uranium (U)	mg/L	—	—	0.0002	0.00025	0.0001			0.00006					0.00003					0.00002					< 0.00002				
Vanadium (V)	mg/L	—	—	0.00022	0.00016	0.00017			0.00019					0.00013					0.00013					0.00018				
Yttrium (Y)	mg/L	—	—	< 0.000005	< 0.000005	0.000005			< 0.000005					0.000005					< 0.000005					< 0.000005				
Tungsten (W)	mg/L	—	—	0.00032	0.00015	0.0005			0.00058					< 0.00007					< 0.00007					< 0.00007				
Zinc (Zn)	mg/L	0.03	1	0.0012	< 0.0003	< 0.0003			< 0.0003					< 0.0003					< 0.0003					0.0036				

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** Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-4
HUMIDITY CELL RESULTS FOR HC 06-03
Greywacke (20 - 50% Argillite Interbeds)

S-Total: 0.578 %
S^{2-}: 0.5 %
NP: 32.70 t CaCO₃/1000 t
CaNP: 49.87 t CaCO₃/1000 t
AP: 15.3 t CaCO₃/1000 t
Weight: 1000 g

Weeks	#	CCME Guideline *	MMER Guideline **	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Date				09-Jan-07	16-Jan-07	23-Jan-07	30-Jan-07	06-Feb-07	13-Feb-07	20-Feb-07	27-Feb-07	06-Mar-07	13-Mar-07	20-Mar-07	27-Mar-07	03-Apr-07	10-Apr-07	17-Apr-07	24-Apr-07	01-May-07	08-May-07	15-May-07	22-May-07	29-May-07	05-Jun-07	12-Jun-07	19-Jun-07	26-Jun-07
Leachate	mL	—	—	748	942	983	948	943	916	989	985	989	988	961	972	988	991	995	962	992	939	987	971	892	909	947	995	986
pH	pH	6.5 - 9	6.0 - 9.5	7.75	8.06	8.27	8.08	7.98	7.82	7.71	7.77	7.62	7.85	7.36	8.06	8.01	7.52	7.86	7.88	7.31	7.29	7.57	7.45	7.64	7.75	7.85	7.78	7.9
Conductivity	µS/cm	—	—	272	211	51	48	37	43	90	88	67	70	35	46	46	38	56	44	30	43	54	36	47	49	57	75	53
Alkalinity	mg/L as CaCO3	—	—	18	27	16	15	12	16	28	25	17	27	11	32	17	13	22	16	10	16	22	15	21	15	24	25	24
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	65	56	5.3	3.9	3	5	9.8	8.9	4.1	4.6	2	3.6	2.9	2.3	3.4	2.7	1.8	2.3	3.6	1.7	3	2.5	3.2	3	2.7
Calcium (Ca)	mg/L	—	—	18.3	18.9	5.87	5.13	3.46	5.93	11.5	9.51	6.67	9.84	4.74	7.53	7.38	5.8	8.81	7.1	4.89	7.16	9.16	6.16	8.93	8.92	10.2	10.2	9.44
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003					< 0.00003					< 0.00003					< 0.00003				
Aluminum (Al)	mg/L	0.1	—	0.104	0.106	0.0622			0.0772					0.0399					0.12					0.141				
Arsenic (As)	mg/L	0.005	1	0.0811	0.1	0.0548			0.121					0.181					0.411					0.324				
Barium (Ba)	mg/L	—	—	0.00295	0.0029	0.00051			0.00045					0.00025					0.00031					0.00034				
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004					< 0.00004					< 0.00004					< 0.00004				
Boron (B)	mg/L	—	—	0.006	0.011	0.005			< 0.002					< 0.002					< 0.002					< 0.002				
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002					< 0.00002					< 0.00002					< 0.00002				
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006					< 0.00006					< 0.00006					< 0.00006				
Cobalt (Co)	mg/L	—	—	0.000395	0.000348	0.000086			< 0.000007					< 0.000007					0.000036					0.000037				
Chromium (Cr)	mg/L	0.0089	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003					< 0.0003					< 0.0003					< 0.0003				
Copper (Cu)	mg/L	0.002	0.6	0.0011	0.0004	0.0002			< 0.0001					< 0.0001					< 0.0001					0.0001				
Lithium (Li)	mg/L	—	--	< 0.002	< 0.002	< 0.002			< 0.002					< 0.002					< 0.002					< 0.002				
Potassium (K)	mg/L	—	—	13.9	10.6	2.76			1.86					0.72					0.69					0.69				
Magnesium (Mg)	mg/L	—	—	3.91	3.76	0.733			0.616					0.345					0.425					0.471				
Manganese (Mn)	mg/L	—	—	0.0285	0.0236	0.026			0.0165					0.0227					0.00806					0.012				
Molybdenum (Mo)	mg/L	0.073	—	0.00156	0.00259	0.00071			0.00005					0.00006					< 0.00005					0.00027				
Sodium (Na)	mg/L	—	—	9.65	7.33	0.92			0.3					0.07					0.1					0.11				
Nickel (Ni)	mg/L	0.025	1	0.004	0.0022	< 0.0007			< 0.0007					< 0.0007					< 0.0007					< 0.0007				
Phosphorous (P)	mg/L	—	—	< 0.01	< 0.01	< 0.01			< 0.01					< 0.01					< 0.01					< 0.01				
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	0.00008	< 0.00002			< 0.00002					< 0.00002					0.00004					< 0.00002				
Antimony (Sb)	mg/L	—	—	0.0044	0.0115	0.0056			0.0055					0.0038					0.0061					0.0083				
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001					< 0.001					< 0.001					< 0.001				
Tin (Sn)	mg/L	—	—	0.0031	0.0011	0.0007			< 0.0003					< 0.0003					< 0.0003					< 0.0003				
Strontium (Sr)	mg/L	—	—	0.0556	0.0579	0.0152			0.0153					0.0101					0.0146					0.0148				
Titanium (Ti)	mg/L	—	—	0.0009	< 0.0002	0.0003			< 0.0002					< 0.0002					< 0.0002					< 0.0002				
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001				
Uranium (U)	mg/L	—	—	0.00095	0.00176	0.00018			0.00037					0.00008					0.00079					0.00043				
Vanadium (V)	mg/L	—	—	0.00043	0.00036	0.00017			0.00026					0.00016					0.00064					0.00045				
Yttrium (Y)	mg/L	—	—	< 0.000005	0.000019	0.000017			0.000012					< 0.000005					< 0.000005					0.000005				
Tungsten (W)	mg/L	—	—	0.00047	0.00057	0.00044			0.00028					< 0.00007					< 0.00007					0.00011				
Zinc (Zn)	mg/L	0.03	1	0.0011	0.0013	0.0009			0.0006					0.0005					0.0013					0.0015				

* : Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1999.
** Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-6
HUMIDITY CELL RESULTS FOR HC 06-061
Composite Material

S-Total:	0.23 %
S^{2-}:	0.2 %
NP:	29.30 t $CaCO_3$/1000 t
CaNP:	24.86 t $CaCO_3$/1000 t
AP:	4.7 t $CaCO_3$/1000 t
Weight:	1000 g

Weeks	#	CCME Guideline *	MMER Guideline **	0	1	2	3	4	5	6	7	8	9
Date				09-Jan-07	16-Jan-07	23-Jan-07	30-Jan-07	06-Feb-07	13-Feb-07	20-Feb-07	27-Feb-07	06-Mar-07	13-Mar-07
Leachate	mL	—	—	766	986	992	960	976	956	948	906	892	919
pH	pH	6.5 - 9	6.0 - 9.5	7.54	7.61	7.78	7.7	7.86	7.64	7.61	7.67	7.69	7.52
Conductivity	µS/cm	—	—	354	186	162	112	99	71	43	42	30	40
Alkalinity	mg/L as CaCO3	—	—	14	14	23	16	29	24	15	13	10	10
Acidity	mg/L as CaCO3	—	—	7	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	130	59	46	25	15	7.2	3.8	5	3.8	5.4
Calcium (Ca)	mg/L	—	—	39.2	22.1	20.4	12.6	9.89	9.23	6.81	6.23	4.48	5.55
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001				
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003				
Aluminum (Al)	mg/L	0.1	—	0.0729	0.0482	0.0556			0.107				
Arsenic (As)	mg/L	0.005	1	0.0031	0.004	0.0048			0.0054				
Barium (Ba)	mg/L	—	—	0.00572	0.00269	0.00272			0.00096				
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004				
Boron (B)	mg/L	—	—	0.004	0.005	0.005			< 0.002				
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002				
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006				
Cobalt (Co)	mg/L	—	—	0.000327	0.000149	0.000141			< 0.000007				
Chromium (Cr)	mg/L	0.0099	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003				
Copper (Cu)	mg/L	0.002	0.6	0.001	0.0009	0.0003			0.002				
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002				
Potassium (K)	mg/L	—	—	17.7	7.04	6.51			2.65				
Magnesium (Mg)	mg/L	—	—	6.61	3.13	2.68			0.847				
Manganese (Mn)	mg/L	—	—	0.0691	0.0482	0.0498			0.0229				
Molybdenum (Mo)	mg/L	0.073	—	0.00051	0.00036	0.00047			< 0.00005				
Sodium (Na)	mg/L	—	—	6.96	2.21	1.65			0.23				
Nickel (Ni)	mg/L	0.025	1	0.0033	0.002	0.0017			< 0.0007				
Phosphorous (P)	mg/L	—	—	< 0.01	< 0.01	< 0.01			< 0.01				
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	0.00005	< 0.00002			0.00004				
Antimony (Sb)	mg/L	—	—	0.0021	0.0016	0.002			0.0022				
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001				
Tin (Sn)	mg/L	—	—	0.0047	0.0012	0.0009			< 0.0003				
Strontium (Sr)	mg/L	—	—	0.0809	0.0464	0.0419			0.0171				
Titanium (Ti)	mg/L	—	—	< 0.0002	< 0.0002	< 0.0002			< 0.0002				
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001				
Uranium (U)	mg/L	—	—	0.00069	0.00065	0.00069			0.00008				
Vanadium (V)	mg/L	—	—	0.00016	0.00013	0.00014			0.00015				
Yttrium (Y)	mg/L	—	—	0.000006	0.00001	0.000016			0.00001				
Tungsten (W)	mg/L	—	—	0.00025	< 0.00007	0.00021			0.00026				
Zinc (Zn)	mg/L	0.03	1	0.0012	0.0008	0.0007			0.002				

Weeks	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Date	20-Mar-07	27-Mar-07	03-Apr-07	10-Apr-07	17-Apr-07	24-Apr-07	01-May-07	08-May-07	15-May-07	22-May-07	29-May-07	05-Jun-07	12-Jun-07	19-Jun-07	26-Jun-07
Leachate	947	982	968	943	945	942	916	949	946	948	950	948	926	968	984
pH	7.45	7.93	7.64	7.36	7.59	7.52	7.46	8.96	7.26	7.36	7.66	7.35	7.76	7.53	7.4
Conductivity	35	46	41	33	42	30	40	31	51	46	67	37	79	62	57
Alkalinity	11	15	13	9	12	6	13	6	14	14	24	9	28	18	18
Acidity	< 2	< 2	< 2	< 2	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	4	5.9	5.3	4.1	5.6	4	6	4.3	8.1	6.3	10	3	11	5.2	7.2
Calcium (Ca)	5.7	8.18	7.07	5.16	6.48	4.64	6	4.82	7.91	7.65	12.4	4.35	14.5	7.89	9.45
Iron (Fe)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	< 0.0001					< 0.0001					< 0.0001				
Silver (Ag)	< 0.00003					< 0.00003					< 0.00003				
Aluminum (Al)	0.0443					0.0488					0.0684				
Arsenic (As)	0.0023					0.0026					0.0069				
Barium (Ba)	0.0003					0.00274					0.00087				
Beryllium (Be)	< 0.00004					< 0.00004					< 0.00004				
Boron (B)	0.003					< 0.002					< 0.002				
Bismuth (Bi)	< 0.00002					< 0.00002					< 0.00002				
Cadmium (Cd)	< 0.00006					< 0.00006					< 0.00006				
Cobalt (Co)	< 0.000007					0.000016					0.000038				
Chromium (Cr)	< 0.0003					< 0.0003					< 0.0003				
Copper (Cu)	< 0.0001					< 0.0001					0.0004				
Lithium (Li)	< 0.002					< 0.002					< 0.002				
Potassium (K)	0.63					0.41					1.04				
Magnesium (Mg)	0.335					0.23					0.746				
Manganese (Mn)	0.0212					0.02					0.0356				
Molybdenum (Mo)	< 0.00005					< 0.00005					0.0002				
Sodium (Na)	0.14					0.05					0.13				
Nickel (Ni)	< 0.0007					< 0.0007					< 0.0007				
Phosphorous (P)	< 0.01					< 0.01					< 0.01				
Lead (Pb)	< 0.00002					< 0.00002					< 0.00002				
Antimony (Sb)	0.0008					< 0.0002					0.0036				
Selenium (Se)	< 0.001					< 0.001					< 0.001				
Tin (Sn)	< 0.0003					< 0.0003					< 0.0003				
Strontium (Sr)	0.0092					0.0077					0.0218				
Titanium (Ti)	< 0.0002					< 0.0002					< 0.0002				
Thallium (Tl)	< 0.0001					< 0.0001					< 0.0001				
Uranium (U)	< 0.00002					0.00008					0.00013				
Vanadium (V)	0.00008					0.00007					0.00012				
Yttrium (Y)	< 0.000005					< 0.000005					< 0.000005				
Tungsten (W)	< 0.00007					< 0.00007					0.0001				
Zinc (Zn)	< 0.0003					< 0.0003					0.0006				

* Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1999.
** : Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002.
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-6
HUMIDITY CELL RESULTS FOR HC 06-47(
Composite Material

S-Total:	0.34 %
S²⁻:	0.4 %
NP:	27.80 t CaCO₃/1000 t
CaNP:	21.18 t CaCO₃/1000 t
AP:	11.6 t CaCO₃/1000 t
Weight:	1000 g

Weeks	#	CCME Guideline *	MMER Guideline **	0	1	2	3	4	5
Date				09-Jan-07	16-Jan-07	23-Jan-07	30-Jan-07	06-Feb-07	13-Feb-07
Leachate	mL	—	—	782	904	880	880	919	875
pH	pH	6.5 - 9	6.0 - 9.5	7.7	7.51	7.49	7.58	7.49	7.38
Conductivity	µS/cm	—	—	141	140	94	76	52	43
Alkalinity	mg/L as CaCO3	—	—	11	11	9	11	9	7
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	38	37	27	18	11	10
Calcium (Ca)	mg/L	—	—	11.3	9.4	7.29	5.68	4.13	4.28
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003
Aluminum (Al)	mg/L	0.1	—	0.0835	0.0305	0.0302			0.0403
Arsenic (As)	mg/L	0.005	1	0.0111	0.0112	0.0098			0.0137
Barium (Ba)	mg/L	—	—	0.00162	0.00148	0.00107			0.00051
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004
Boron (B)	mg/L	—	—	0.002	0.004	0.002			< 0.002
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006
Cobalt (Co)	mg/L	—	—	0.000156	0.000132	0.000098			< 0.000007
Chromium (Cr)	mg/L	0.0089	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003
Copper (Cu)	mg/L	0.002	0.6	0.0009	0.0005	0.0004			0.0001
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002
Potassium (K)	mg/L	—	—	7.26	5.4	4.41			2.13
Magnesium (Mg)	mg/L	—	—	2.25	2.62	1.98			0.78
Manganese (Mn)	mg/L	—	—	0.0407	0.0498	0.0412			0.0322
Molybdenum (Mo)	mg/L	0.073	—	0.00049	0.00059	0.00082			0.00006
Sodium (Na)	mg/L	—	—	5.25	4.84	3.5			0.98
Nickel (Ni)	mg/L	0.025	1	0.0016	0.0016	0.001			< 0.0007
Phosphorous (P)	mg/L	—	—	< 0.01	0.01	< 0.01			< 0.01
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	0.00006	< 0.00002			0.0001
Antimony (Sb)	mg/L	—	—	0.001	0.001	0.001			0.0006
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001
Tin (Sn)	mg/L	—	—	0.0133	0.0029	0.0015			< 0.0003
Strontium (Sr)	mg/L	—	—	0.0247	0.0246	0.0181			0.0096
Titanium (Ti)	mg/L	—	—	0.0004	< 0.0002	0.0003			< 0.0002
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001
Uranium (U)	mg/L	—	—	0.00011	0.00035	0.00037			0.00013
Vanadium (V)	mg/L	—	—	0.00018	0.00007	0.00007			0.00008
Yttrium (Y)	mg/L	—	—	0.000008	0.000013	0.000018			0.000017
Tungsten (W)	mg/L	—	—	0.00022	< 0.00007	0.00017			0.00019
Zinc (Zn)	mg/L	0.03	1	< 0.0003	< 0.0003	< 0.0003			< 0.0003

Weeks	6	7	8	9	10	11	12	13	14	15
Date	20-Feb-07	27-Feb-07	06-Mar-07	13-Mar-07	20-Mar-07	27-Mar-07	03-Apr-07	10-Apr-07	17-Apr-07	24-Apr-07
Leachate	886	857	855	848	940	996	920	880	852	830
pH	7.44	7.25	7.35	7.25	7.28	7.6	7.56	6.87	7.37	7.3
Conductivity	35	31	27	28	30	40	238	24	26	22
Alkalinity	10	8	7	7	9	12	15	4	7	6
Acidity	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	5	< 2
Sulphate (SO_4)	6.3	5.6	4.4	3.7	4.2	5	5.6	2.3	2.7	2.5
Calcium (Ca)	4.13	3.38	2.98	2.84	4.33	5.15	6.64	2.87	3.05	2.68
Iron (Fe)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)					< 0.0001					< 0.0001
Silver (Ag)					< 0.00003					< 0.00003
Aluminum (Al)					0.0341					0.0324
Arsenic (As)					0.0149					0.0115
Barium (Ba)					0.00033					0.00027
Beryllium (Be)					< 0.00004					< 0.00004
Boron (B)					0.002					< 0.002
Bismuth (Bi)					< 0.00002					< 0.00002
Cadmium (Cd)					< 0.00006					< 0.00006
Cobalt (Co)					< 0.000007					0.000044
Chromium (Cr)					< 0.0003					< 0.0003
Copper (Cu)					< 0.0001					0.0002
Lithium (Li)					< 0.002					< 0.002
Potassium (K)					0.88					0.56
Magnesium (Mg)					0.498					0.285
Manganese (Mn)					0.0394					0.0284
Molybdenum (Mo)					< 0.00005					< 0.00005
Sodium (Na)					0.16					0.09
Nickel (Ni)					< 0.0007					< 0.0007
Phosphorous (P)					< 0.01					< 0.01
Lead (Pb)					0.00004					0.00013
Antimony (Sb)					0.0007					< 0.0002
Selenium (Se)					< 0.001					< 0.001
Tin (Sn)					0.0004					0.0012
Strontium (Sr)					0.0067					0.0036
Titanium (Ti)					< 0.0002					< 0.0002
Thallium (Tl)					< 0.0001					< 0.0001
Uranium (U)					< 0.00002					0.00003
Vanadium (V)					0.00007					0.00009
Yttrium (Y)					< 0.000005					< 0.000005
Tungsten (W)					< 0.00007					< 0.00007
Zinc (Zn)					< 0.0003					0.0046

Weeks	16	17	18	19	20	21	22	23	24
Date	01-May-07	08-May-07	15-May-07	22-May-07	29-May-07	05-Jun-07	12-Jun-07	19-Jun-07	26-Jun-07
Leachate	867	858	889	854	826	856	868	898	882
pH	7.19	6.83	6.96	6.96	7.09	7.21	7.27	7	7.06
Conductivity	24	23	25	20	18	31	28	36	29
Alkalinity	7	14	6	6	6	6	6	6	7
Acidity	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	3.2	2.6	3.7	2	2.4	3.3	3	2.7	3.6
Calcium (Ca)	3.07	2.78	2.94	2.7	2.73	2.86	3.85	2.81	3.97
Iron (Fe)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)					< 0.0001				
Silver (Ag)					< 0.00003				
Aluminum (Al)					0.0264				
Arsenic (As)					0.0122				
Barium (Ba)					0.00021				
Beryllium (Be)					< 0.00004				
Boron (B)					< 0.002				
Bismuth (Bi)					< 0.00002				
Cadmium (Cd)					< 0.00006				
Cobalt (Co)					0.000042				
Chromium (Cr)					< 0.0003				
Copper (Cu)					0.0003				
Lithium (Li)					< 0.002				
Potassium (K)					0.48				
Magnesium (Mg)					0.308				
Manganese (Mn)					0.0303				
Molybdenum (Mo)					0.00014				
Sodium (Na)					0.67				
Nickel (Ni)					< 0.0007				
Phosphorous (P)					< 0.01				
Lead (Pb)					0.00003				
Antimony (Sb)					0.001				
Selenium (Se)					< 0.001				
Tin (Sn)					< 0.0003				
Strontium (Sr)					0.0036				
Titanium (Ti)					< 0.0002				
Thallium (Tl)					< 0.0001				
Uranium (U)					< 0.00002				
Vanadium (V)					0.00007				
Yttrium (Y)					< 0.000005				
Tungsten (W)					< 0.00007				
Zinc (Zn)					0.0005				

* Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1998.
** Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II 2002
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-4
HUMIDITY CELL RESULTS FOR HC 06-005
Marginal Ore

S-Total: 0.48 %
S^{2-}: 0.2 %
NP: 26.50 t CaCO3/1000 t
CaNP: 20.85 t CaCO3/1000 t
AP: 6.9 t CaCO3/1000 t
Weight: 1000 g

Weeks / Date	#	CCME Guideline *	MMER Guideline **	0 09-Jan-07	1 16-Jan-07	2 23-Jan-07	3 30-Jan-07	4 06-Feb-07	5 13-Feb-07	6 20-Feb-07	7 27-Feb-07
Leachate	mL	—	—	758	935	899	890	926	988	938	870
pH	pH	6.5 - 9	6.0 - 9.5	7.67	7.41	7.25	7.4	7.08	7.57	7.53	7.43
Conductivity	µS/cm	—	—	152	129	75	80	39	77	49	52
Alkalinity	mg/L as CaCO3	—	—	12	11	7	8	6	17	10	9
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	41	37	20	20	8.9	12	9.6	12
Calcium (Ca)	mg/L	—	—	13.1	10.7	6.33	6.5	3.13	9.19	6.61	6.16
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001		
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003		
Aluminum (Al)	mg/L	0.1	—	0.0614	0.0383	0.0196			0.081		
Arsenic (As)	mg/L	0.005	1	0.012	0.0128	0.0081			0.0217		
Barium (Ba)	mg/L	—	—	0.00132	0.00119	0.00069			0.00066		
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004			< 0.00004		
Boron (B)	mg/L	—	—	0.01	0.004	0.003			< 0.002		
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002		
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006			< 0.00006		
Cobalt (Co)	mg/L	—	—	0.000115	0.000088	0.000064			< 0.000007		
Chromium (Cr)	mg/L	0.0089	—	< 0.0003	< 0.0003	< 0.0003			< 0.0003		
Copper (Cu)	mg/L	0.002	0.6	0.0009	0.0002	0.0003			< 0.0001		
Lithium (Li)	mg/L	—	—	< 0.002	< 0.002	< 0.002			< 0.002		
Potassium (K)	mg/L	—	—	8.18	6.05	3.56			2.08		
Magnesium (Mg)	mg/L	—	—	7.83	2.69	1.56			0.917		
Manganese (Mn)	mg/L	—	—	0.0377	0.038	0.0291			0.0447		
Molybdenum (Mo)	mg/L	0.073	—	0.00021	0.00069	0.00057			< 0.00005		
Sodium (Na)	mg/L	—	—	4.22	3.53	1.8			0.38		
Nickel (Ni)	mg/L	0.025	1	0.0019	0.0027	0.0007			< 0.0007		
Phosphorous (P)	mg/L	—	—	< 0.01	0.03	< 0.01			< 0.01		
Lead (Pb)	mg/L	0.001	0.4	< 0.0002	0.00002	< 0.00002			< 0.00002		
Antimony (Sb)	mg/L	—	—	0.0018	0.0022	0.0018			0.0021		
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001			< 0.001		
Tin (Sn)	mg/L	—	—	0.0027	0.0009	0.0008			0.0003		
Strontium (Sr)	mg/L	—	—	0.0272	0.0262	0.0154			0.0179		
Titanium (Ti)	mg/L	—	—	0.0008	< 0.0002	< 0.0002			< 0.0002		
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001		
Uranium (U)	mg/L	—	—	0.0001	0.00023	0.00013			0.00011		
Vanadium (V)	mg/L	—	—	0.00013	< 0.00006	< 0.00006			0.00014		
Yttrium (Y)	mg/L	—	—	< 0.000005	0.000011	0.00001			0.000013		
Tungsten (W)	mg/L	—	—	0.00011	< 0.00007	0.00011			0.00012		
Zinc (Zn)	mg/L	0.03	1	< 0.0003	0.0005	0.0005			< 0.0003		

Weeks / Date	8 06-Mar-07	9 13-Mar-07	10 20-Mar-07	11 27-Mar-07	12 03-Apr-07	13 10-Apr-07	14 17-Apr-07	15 24-Apr-07	16 01-May-07
Leachate	944	985	850	986	841	900	849	856	867
pH	7.02	7.35	7.11	7.58	7.13	7.21	7.31	6.95	6.87
Conductivity	59	41	33	37	33	40	46	22	30
Alkalinity	8	9	7	9	8	8	7	4	4
Acidity	< 2	< 2	< 2	< 2	< 2	< 2	3	< 2	< 2
Sulphate (SO_4)	5.3	7.2	5.5	6.6	5.9	7.7	9.2	4.3	6.9
Calcium (Ca)	4	5.15	4.55	5.82	4.61	5.56	5.98	2.89	3.67
Iron (Fe)	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)			< 0.0001					< 0.0001	
Silver (Ag)			< 0.00003					< 0.00003	
Aluminum (Al)			0.0301					0.0188	
Arsenic (As)			0.0121					0.0083	
Barium (Ba)			0.00025					0.00015	
Beryllium (Be)			< 0.00004					< 0.00004	
Boron (B)			< 0.002					< 0.002	
Bismuth (Bi)			< 0.00002					< 0.00002	
Cadmium (Cd)			< 0.00006					< 0.00006	
Cobalt (Co)			< 0.000007					0.000062	
Chromium (Cr)			< 0.0003					< 0.0003	
Copper (Cu)			< 0.0001					< 0.0001	
Lithium (Li)			< 0.002					< 0.002	
Potassium (K)			0.75					0.37	
Magnesium (Mg)			0.468					0.293	
Manganese (Mn)			0.0239					0.0187	
Molybdenum (Mo)			< 0.00005					< 0.00005	
Sodium (Na)			0.08					0.63	
Nickel (Ni)			< 0.0007					< 0.0007	
Phosphorous (P)			< 0.01					< 0.01	
Lead (Pb)			< 0.00002					< 0.00002	
Antimony (Sb)			0.0018					0.0011	
Selenium (Se)			< 0.001					< 0.001	
Tin (Sn)			< 0.0003					< 0.0003	
Strontium (Sr)			0.0077					0.0049	
Titanium (Ti)			< 0.0002					< 0.0002	
Thallium (Tl)			< 0.0001					< 0.0001	
Uranium (U)			< 0.00002					0.00002	
Vanadium (V)			< 0.00006					< 0.00006	
Yttrium (Y)			< 0.000005					< 0.000005	
Tungsten (W)			< 0.00007					< 0.00007	
Zinc (Zn)			0.0006					0.0008	

Weeks / Date	17 08-May-07	18 15-May-07	19 22-May-07	20 29-May-07	21 05-Jun-07	22 12-Jun-07	23 19-Jun-07	24 26-Jun-07
Leachate	865	894	859	823	875	913	915	995
pH	6.59	6.61	6.83	6.88	7.03	7.25	6.93	7.17
Conductivity	32	33	30	32	37	46	42	40
Alkalinity	4	4	4	4	5	8	5	7
Acidity	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	6.2	6.3	6.1	9.9	6.8	11	6	8.9
Calcium (Ca)	3.35	4.31	3.98	5.03	3.8	6.93	3.55	6.03
Iron (Fe)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Mercury (Hg)				< 0.0001				
Silver (Ag)				< 0.00003				
Aluminum (Al)				0.0139				
Arsenic (As)				0.0093				
Barium (Ba)				0.00021				
Beryllium (Be)				< 0.00004				
Boron (B)				< 0.002				
Bismuth (Bi)				< 0.00002				
Cadmium (Cd)				< 0.00006				
Cobalt (Co)				0.000079				
Chromium (Cr)				< 0.0003				
Copper (Cu)				0.0002				
Lithium (Li)				< 0.002				
Potassium (K)				0.41				
Magnesium (Mg)				0.447				
Manganese (Mn)				0.0229				
Molybdenum (Mo)				0.0001				
Sodium (Na)				0.03				
Nickel (Ni)				< 0.0007				
Phosphorous (P)				< 0.01				
Lead (Pb)				< 0.00002				
Antimony (Sb)				0.0038				
Selenium (Se)				< 0.001				
Tin (Sn)				< 0.0003				
Strontium (Sr)				0.0091				
Titanium (Ti)				< 0.0002				
Thallium (Tl)				< 0.0001				
Uranium (U)				0.00006				
Vanadium (V)				< 0.00006				
Yttrium (Y)				< 0.000005				
Tungsten (W)				< 0.00007				
Zinc (Zn)				< 0.0003				

* Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines 1998
** Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines

Appendix B-1
HUMIDITY CELL RESULTS FOR CND2 Treated Solids (Master Composite
Tailings Materia

S-Total: 0.17 %
S²⁻: 0.1 %
NP: 21.50 t CaCO₃/1000 t
CaNP: 20.35 t CaCO₃/1000 t
AP: 3.44 t CaCO₃/1000 t
Weight: 1000 g

Weeks / Date	#	CCME Guideline *	MMER Guideline **	0 25-Oct-06	1 01-Nov-06	2 08-Nov-06	3 14-Nov-06	4 22-Nov-06	5 29-Nov-06	6 06-Dec-06	7 13-Dec-06	8 20-Dec-06	9 27-Dec-06	10 02-Jan-07	11 09-Jan-07	12 17-Jan-07	13 24-Jan-07	14 31-Jan-07	15 07-Feb-07	16 14-Feb-07	17 21-Feb-07	18 Feb 28, 2007	19 07-Mar-07	20 14-Mar-07	21 21-Mar-07
Leachate	mL	—	—	833	993	985	987	984	976	990	987	994	995	977	988	991	990	1002	980	991	1000	952	990	995	976
pH	pH	6.5 - 9	6.0 - 9.5	7.77	7.33	7.43	7.32	7.05	7.3	7.47	7.14	7.34	7.28	7.31	6.84	7.48	7.45	7.4	7.38	7.34	7.38	7.37	7.37	7.33	7.18
Conductivity	µS/cm	—	—	228	154	349	99	94	74	82	78	77	77	59	66	64	72	66	64	67	76	66	74	78	72
Alkalinity	mg/L as CaCO3	—	—	15	16	38	13	14	12	13	13	13	11	10	8	14	11	11	11	9	11	9	10	11	9
Acidity	mg/L as CaCO3	—	—	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	63	42	100	25	24	16	21	19	19	19	15	15	15	16	15	15	16	19	17	17	20	20
NH_3+NH_4 as N	mg/L	—	—	8.2	1.5	3.8	0.7	0.4	0.3					0.2					0.2					0.2	
NO_3 as N	mg/L	—	—	< 0.05	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06					< 0.06					< 0.06					<0.06	
Calcium (Ca)	mg/L	—	—	12.8	10.3	22.4	7.61	7.94	2.82					6.34					7.61					6.84	
Iron (Fe)	mg/L	0.3	—	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01					< 0.01					< 0.01					< 0.01	
Mercury (Hg)	mg/L	—	—	—	—	—			—					< 0.0001					< 0.0001					< 0.0001	
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003			< 0.00003					< 0.00003					< 0.00003					< 0.00003	
Aluminum (Al)	mg/L	0.1	—	0.0569	0.0234	0.057			0.0374					0.0157					0.0146					0.0101	
Arsenic (As)	mg/L	0.005	1	0.0538	0.0218	0.0573			0.0106					0.0053					0.0051					0.0027	
Barium (Ba)	mg/L	—	—	0.00112	0.00098	0.00265			0.00052					0.00058					0.00062					0.00072	
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	0.00011			< 0.00004					< 0.00004					< 0.00004					< 0.00004	
Boron (B)	mg/L	—	—	0.01	0.003	0.009			0.018					< 0.002					< 0.002					< 0.002	
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002			< 0.00002					< 0.00002					< 0.00002					< 0.00002	
Cadmium (Cd)	mg/L	0.000017	—	< 0.00006	< 0.00006	< 0.00006	0.0000	0.0000	< 0.00006	0	0	0	0	< 0.00006	0	0	0	0	< 0.00006	0	0	0	0	< 0.00006	0
Cobalt (Co)	mg/L	—	—	0.0123	0.00748	0.0167			0.00211					0.001008					0.000476					0.000321	
Chromium (Cr)	mg/L	0.0099	—	< 0.0003	0.001	0.0004			0.0007					< 0.0003					< 0.0003					< 0.0003	
Copper (Cu)	mg/L	0.002	0.6	0.0043	0.0017	0.002			0.0009					0.0004					0.0008					0.0006	
Lithium (Li)	mg/L	—	—	0.002	< 0.002	< 0.002	0.0000	0.0000	< 0.002	0	0	0	0	< 0.002	0	0	0	0	< 0.002	0	0	0	0	< 0.002	0
Potassium (K)	mg/L	—	—	2.78	1.68	5.15			0.52					0.64					0.55					0.47	
Magnesium (Mg)	mg/L	—	—	1.06	0.956	2.64			0.342					1.14					1.42					1.65	
Manganese (Mn)	mg/L	—	—	0.032	0.0546	0.0787			0.0504					0.0538					0.0723					0.11	
Molybdenum (Mo)	mg/L	0.073	—	0.00561	0.00251	0.00386			0.00091					0.0002					0.00066					0.00024	
Sodium (Na)	mg/L	—	—	26.2	14.8	34.3			5.72					1.95					0.89					0.45	
Nickel (Ni)	mg/L	0.025	1	0.0008	< 0.0007	< 0.0007			< 0.0007					< 0.0007					< 0.0007					< 0.0007	
Phosphorous (P)	mg/L	—	—	0.02	0.02	0.02			0.02					0.01					< 0.01					< 0.01	
Lead (Pb)	mg/L	0.001	0.4	0.00003	0.00011	0.00007			0.00035					< 0.00002					0.00002					< 0.00002	
Antimony (Sb)	mg/L	—	—	0.0024	< 0.0002	0.0027			0.0006					0.0004					0.0004					< 0.0002	
Selenium (Se)	mg/L	0.001	—	< 0.003	< 0.003	< 0.003			< 0.003					< 0.001					< 0.001					< 0.001	
Tin (Sn)	mg/L	—	—	0.0103	0.0062	0.0026			0.0016					0.0003					0.0004					0.001	
Strontium (Sr)	mg/L	—	—	0.0242	0.0229	0.0501			0.0138					0.0131					0.015					0.0188	
Titanium (Ti)	mg/L	—	—	0.0007	0.0008	0.0003			0.0006					< 0.0002					< 0.0002					0.0003	
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001			< 0.0001					< 0.0001					< 0.0001					< 0.0001	
Uranium (U)	mg/L	—	—	0.00012	0.00012	0.00048			0.00005					0.00007					0.00007					0.00009	
Vanadium (V)	mg/L	—	—	0.00028	< 0.00006	0.00028			< 0.00006					< 0.00006					< 0.00006					< 0.00006	
Yttrium (Y)	mg/L	—	—	0.00192	0.0011	0.00426			0.00041					< 0.00007					0.000005					< 0.000005	
Tungsten (W)	mg/L	—	—	< 0.000005	0.00001	0.000016			0.00001					< 0.000005					< 0.00007					< 0.00007	
Zinc (Zn)	mg/L	0.03	1	0.0021	0.0013	0.0015			0.0022					0.0005					0.0009					0.0009	

* Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1§

** Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 200

1 Value is above CCME Guideline

Value is above MMER Guideline

Appendix B-8
HUMIDITY CELL RESULTS FOR CN1 CND 1-7 (TWB)
Tailings Material

S-Total:	0.23 %
S^{2-}:	0.20 %
NP:	20.60 t $CaCO_3$/1000 t
CaNP:	12.10 t $CaCO_3$/1000 t
AP:	6.30 t $CaCO_3$/1000 t
Weight:	1000 g

Weeks Date	#	CCME Guideline *	MMER Guideline **	0 24-Apr-07	1 01-May-07	2 08-May-07	3 15-May-07	4 22-May-07	5 29-May-07	6 05-Jun-07	7 12-Jun-07	8 19-Jun-07	9 26-Jun-07	10 03-Jul-07
Leachate	mL	—	—	770	952	884	922	886	888	885	650	917	898	889
pH	pH	6.5 - 9	6.0 - 9.5	6.34	7.79	7.03	7.4	7.11	7.15	7.2	7.26	7.21	7.25	7.17
Conductivity	µS/cm	—	—	41	121	81	91	79	77	100	106	86	90	83
Alkalinity	mg/L as CaCO3	—	—	< 2	13	10	9	7	6	11	9	7	7	7
Acidity	mg/L as CaCO3	—	—	7	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Sulphate (SO_4)	mg/L	—	—	51	30	19	24	21	23	27	30	26	25	26
Calcium (Ca)	mg/L	—	—	10.1	6.78	4.81	4.84	4.26	4.58	5.32	6.53	6.03	5.89	6.05
Iron (Fe)	mg/L	0.3	—	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
NH_3+NH_4 as N	mg/L	—	—	0.6	1.6	0.8	0.6	0.3	0.3	—	—	—	—	—
NO_2 as N	mg/L	—	—	0.16	< 0.05	< 0.05	< 0.05	0.12	0.07	—	—	—	—	—
Mercury (Hg)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001	—	—	< 0.0001	—	—	—	—	—
Silver (Ag)	mg/L	0.0001	—	< 0.00003	< 0.00003	< 0.00003	—	—	< 0.00003	—	—	—	—	—
Aluminum (Al)	mg/L	0.1	—	0.09	0.04	0.04	—	—	0.03	—	—	—	—	—
Arsenic (As)	mg/L	0.005	1	0.0673	0.0267	0.019	—	—	0.0094	—	—	—	—	—
Barium (Ba)	mg/L	—	—	0.00093	0.00071	0.00045	—	—	0.00045	—	—	—	—	—
Beryllium (Be)	mg/L	—	—	< 0.00004	< 0.00004	< 0.00004	—	—	< 0.00004	—	—	—	—	—
Boron (B)	mg/L	—	—	0.006	0.002	0.001	—	—	0.002	—	—	—	—	—
Bismuth (Bi)	mg/L	—	—	< 0.00002	< 0.00002	< 0.00002	—	—	< 0.00002	—	—	—	—	—
Cadmium (Cd)	mg/L	0.000017	—	< 0.00001	< 0.00001	< 0.00006	—	—	< 0.00001	—	—	—	—	—
Cobalt (Co)	mg/L	—	—	0.00914	0.00499	0.00327	—	—	0.00266	—	—	—	—	—
Chromium (Cr)	mg/L	0.0099	—	< 0.0003	< 0.0003	< 0.0003	—	—	< 0.0003	—	—	—	—	—
Copper (Cu)	mg/L	0.002	0.6	0.0039	0.0023	0.002	—	—	0.0019	—	—	—	—	—
Potassium (K)	mg/L	—	—	2.66	1.59	0.99	—	—	1.01	—	—	—	—	—
Lithium (Li)	mg/L	—	—	0.0016	0.0016	0.0011	—	—	0.0015	—	—	—	—	—
Magnesium (Mg)	mg/L	—	—	0.632	0.583	0.4	—	—	0.585	—	—	—	—	—
Manganese (Mn)	mg/L	—	—	0.017	0.0308	0.0276	—	—	0.022	—	—	—	—	—
Molybdenum (Mo)	mg/L	0.073	—	0.00284	0.00152	0.00143	—	—	0.001	—	—	—	—	—
Sodium (Na)	mg/L	—	—	22.6	13	7.61	—	—	8.54	—	—	—	—	—
Nickel (Ni)	mg/L	0.025	1	< 0.0007	< 0.0007	< 0.0007	—	—	< 0.0007	—	—	—	—	—
Lead (Pb)	mg/L	0.001	0.4	0.00003	< 0.00002	0.00004	—	—	0.00008	—	—	—	—	—
Phosphorous (P)	mg/L	—	—	0.02	< 0.01	< 0.01	—	—	< 0.01	—	—	—	—	—
Antimony (Sb)	mg/L	—	—	0.0025	0.0014	0.0012	—	—	0.0011	—	—	—	—	—
Selenium (Se)	mg/L	0.001	—	< 0.001	< 0.001	< 0.001	—	—	< 0.001	—	—	—	—	—
Tin (Sn)	mg/L	—	—	0.0022	0.001	0.001	—	—	< 0.0003	—	—	—	—	—
Strontium (Sr)	mg/L	—	—	0.0216	0.0162	0.0106	—	—	0.0117	—	—	—	—	—
Titanium (Ti)	mg/L	—	—	0.0003	0.0002	0.0004	—	—	0.0002	—	—	—	—	—
Thallium (Tl)	mg/L	—	—	< 0.0001	< 0.0001	< 0.0001	—	—	< 0.0001	—	—	—	—	—
Uranium (U)	mg/L	—	—	0.00011	0.0001	0.00005	—	—	0.00003	—	—	—	—	—
Vanadium (V)	mg/L	—	—	0.00032	0.00011	0.00012	—	—	0.00007	—	—	—	—	—
Tungsten (W)	mg/L	—	—	0.00229	0.00113	0.00072	—	—	0.00032	—	—	—	—	—
Yttrium (Y)	mg/L	—	—	< 0.000005	< 0.000005	0.000005	—	—	< 0.000005	—	—	—	—	—
Zinc (Zn)	mg/L	0.03	1	0.0004	0.001	0.0005	—	—	0.0022	—	—	—	—	—

* : Canadian Water Quality Guidelines for the Protection of Aquatic Life, Canadian Council of Environmental Ministers (CCME) Canadian Environmental Quality Guidelines, 1999.
** : Federal Canadian Metal Mining Effluent Regulations, Canada Gazette Part II, 2002.
1 Value is above CCME Guidelines
1 Value is above MMER Guidelines