Kiggavik Project
Final Environmental Impact Statement

Tier 3 Technical Appendix 5F
Mine Rock Characterization, and Management

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1 Introduction

1.1 Overview

The Kiggavik Project is a proposed uranium ore mining and milling operation located in the Kivalliq region of Nunavut approximately 80 km west of the community of Baker Lake.

This document is a Technical Appendix to Volume 5, Aquatic Environment, of the Kiggavik Environment Impact Statement (EIS). Information relevant to mine rock characterization, assessment and management is presented in this Technical Appendix.

The Kiggavik Project includes four open pit mines and one underground mine. The Main Zone, Centre Zone and East Zone Pits are near each other and the Andrew Lake Pit and End Grid Underground Mine are located about 15 km to the southwest. With respect to mine rock management, which is the focus of this Technical Appendix, the main facilities will include permanent and temporary stockpiles at the Kiggavik and Sissons sites.

This document provides a detailed discussion of the proposed design, operation and decommissioning of the mine rock management system at Kiggavik and Sissons. Additionally, predicted operational and long term effects, mitigative measures, and contingency measures related to mine rock management are presented. Detailed information relevant to tailings is presented in the Technical Appendix 5J "Tailings Characterization and Management".

1.2 Purpose and Scope

This purpose of this report is to document mine rock data and to describe the proposed mine rock management plan for the Kiggavik Project and the measures proposed to prevent and /or mitigate the potentially adverse effects of mine rock on the receiving environment.

The scope of work for description of the mine rock management plan included field and laboratory studies, geochemical interpretation synthesis to determine a conceptual design of the mine rock management facility.

The scope of this document is to:

- Characterize the physical and geochemical properties of the materials, as they relate to the long term management of mine rock;

Assess the various options for long term management of mine rock;
Choose the preferred option to propose in the mine plan submission;
Describe the measures taken for design and construction of the preferred option; and
Describe the measures to monitor and provide assurance that the management option performs as required to safeguard human and environment health and safety during operations and long term closure of the mine rock management facility.

This report is organized as follows:

Section 1 - Introduction
Section 2 – Review of Mine Rock Disposal Practices
Section 3 – Geological Context
Section 4 – Mine Rock Assessment Methodology
Section 5 – Mine Rock Characterization
Section 6 – Mine Rock Segregation
Section 7 – Source Term Assessment
Section 8 – Mine Rock Management Facilities
Section 9 - Potential Post-Decommissioning Effects
Section 10 – Andrew Lake Pit Water Quality
Section 11 – Monitoring and Follow-up Programs
Section 12 – Conclusions

This report was prepared by AREVA and EcoMetrix Incorporated.

2 Review of Mine Rock Disposal Practices

Other than providing capacity and maintaining physical stability, the primary goal of mine rock management is to limit or prevent effects on quality of water in the downstream environment. Planning for mine rock management should consider the long-term physical stability of these facilities and the risks associated with long-term metal leaching and acidic drainage. In order for this to be completed effectively, the mine rock has to be well characterized and assessed with respect to the planned storage method. If the mine rock is potentially acid generating or is metal leaching, mitigation strategies will be required.

The Canadian Nuclear Safety Commission (CNSC) has issued a document RD/GD-370 entitled "Management of Uranium Mine Waste Rock and Mill Tailings" (CNSC, 2011) that provides guidance for management practices for mine rock at new uranium mining projects throughout Canada. The CNSC document states that the use of mine workings such as open pits and underground developments should be maximized; however the use of natural fish-bearing water bodies shall be avoided. The guidance suggests the use of best management practices with due consideration of the characteristics of mine rock and tailings with controls that are designed to minimize release to the environment to ensure long-term protection of the environment and the safety of current and future generations. Wherever possible, clean materials, including overburden and rock should be used for construction or as a resource through effective segregation practices.

Mine rock management in a permafrost environment is not significantly different from that in non-permafrost areas. In some instances, engineering designs are established to take advantage of the sub-zero temperatures in permafrost terrain. For example, mine rock placement can be designed to accelerate and maintain frozen conditions to limit weathering or acid generation in reactive wastes. However, global warming suggests that permafrost conditions may be diminishing in Canada's north over the next 100 years. Therefore, as a cautionary approach, it is prudent to develop designs that do not rely on permafrost conditions for successful mine rock or tailings management. Mine rock management in this project do not include designs that rely on permafrost for protection of the environment. The designs considered in this project are compatible with a permafrost environment and may result in enhanced performance from sub-zero conditions but do not include permafrost requirements for success.

Best practice for mine materials management is based on characterization of the rock to understand potential risks for acid generation and metal leaching. Materials can be classified according to master variables such as sulphur content, metal content and uranium grade to ensure that specific classes of material can be either stored safely with no controls or stored with appropriate natural or engineered barriers to prevent unacceptable releases of constituents to the environment.

In this project, mine materials were characterized and then, on the basis of characteristics and predicted behaviour in the environment, were classified into three categories. Clean rock material was classified into two categories; Type 1 for construction and unrestricted use as a resource and Type 2 that contained uranium levels above clearance criterion of 1 Bq/g (about 80mg-U/kg), was classified for long term storage in stockpiles on surface within the mine lease boundary. Material that was not ore and did not meet the "clean" criteria was classified as Type 3 and will be backfilled into pits and submerged in water for safe, long term disposal. Type 3 mine rock in this Project is commonly referred to as 'special waste' (see below).

Management of mine waste at other uranium mining facilities in Northern Saskatchewan has included segregation of mine rock during operation into either "Clean Waste" being that with uranium contents below a critical value, or "Special Waste" being rock with elevated uranium and/or sulphide contents and requiring special management. Typically, the Special waste is placed back into the mined-out pit and flooded to limit oxidation and release of metals, acidity and other oxidation products. The process of segregating the different classes of materials is discussed in Section 6 of this report.

3 Geological Context

3.1 Introduction

The following sections summarize the geology of the Kiggavik Project deposits, as it is relevant to the development of a mine rock management plan. Additional information can be found in the Technical Appendix 5B (Geology and Hydrogeology Baseline).

From a regional perspective the Kiggavik Project is located in the Rae Province (Hoffman, 1990), at the southwest termination of the Woodburn Group. The Archean Woodburn Group is a typical "greenstone belt" or supracrustal sequence consisting of a lower (mafic/ultramafic) metavolcanic assemblage and an upper metasedimentary (metagreywacke and quartzite) assemblage (Ashton, 1982). The supracrustal rocks are in tectonic contact with, and structurally overlie, Archean basement gneisses which are predominantly granitic with a minor amphibolitic component. The Woodburn Group is, in Kiggavik, unconformably overlain by the Paleo-Proterozoic metavolcanosedimenary Ketyet River Group and then by the non-metamorphosed Mesoproterozoic detritics of the supracrustal Dubawnt Supergroup (i.e. Thelon basin).

3.2 Local Geology

Kiggavik Area

Basement host rocks are composed of metasediments, and to a lesser extent altered granite and intrusive rocks. Metasediments are sedimentary rocks that have been metamorphosed (altered by heat, pressure or chemically active fluids). Intrusive rocks are igneous rocks that intrude into pre-existing rocks, along some structure. Uranium mineralization in the Kiggavik area is hosted for the most part in altered metasedimentary rocks (mainly meta-arkose, metapelites and sericite schist), and to a much lesser extent in altered granite and intrusive rocks.

Andrew Lake Area

The Andrew Lake deposit is located in metasediments overlying granitic gneiss (banded metamorphic rocks) and granodiorite (an igneous rock). Within the Kiggavik project, granite is the dominant igneous rock (monzo-granite to syeno-granite) as alkali feldspar content is more dominant. These formations have been strongly metamorphosed and altered, tectonized, and intruded. The rocks have gently dipping foliation, small scale recumbent folding, and low angle thrusting. The Andrew Lake deposit is located on a major east-northeast structure. This region has seen several episodes of hydraulic brecciation, mainly within the granite and syenite rocks, and to a lesser extent

in the metasediment units. The subvertical faulting associated with the Andrew Lake deposit governs the extension of the mineralization.

Three main mineralized lenses have been identified at the Andrew Lake deposit. These are associated with strongly altered metasediments, altered paragneiss (gneiss metamorphosed from a sedimentary parent), and less altered metasediments. The zones overlie each other, and are separated by a quartz breccia (a poorly sorted rock commonly containing rock fragments), and paragneiss. Mineralization within the Andrew Lake area occurs between 70 and 300 m below ground surface.

Abundant interspersions of syenite and lamprophyre intrusive units are common throughout the Andrew Lake deposit area. The entire deposit area is overlain by approximately 10 to 20 m of unconsolidated overburden material.

End Grid Area

The End Grid deposit is located in metasediments, intruded by granite, porphyries, syenites and lamprophyres. The mineralization within the deposit is is related to an East/North East quartz healed breccia. Most of the mineralization is observed along fracture planes, associated with quartz veins and locally leached out along foliation with no significant vertical offsets.

Two main mineralized pods (North Pod and South Pod) have been identified at the End Grid deposit. These are located in strongly altered metasediment that are tectonized, with steeply dipping tension faults and hydraulic breccias. Mineralization at the End Grid deposit occurs between 75 m and 475 m below ground surface.

The 2009 drilling program on the North Pod confirmed that a thick oxidized horizon is encountered from surface to 80-300 m below the surface. It was traditionally interpreted as a paleoweathering profile emplaced before the sub-Thelon formations deposit. The mineralization envelopes are limited upwards by this oxidized horizon, which is interpreted to postdate the hydraulic silica breccias and granitic veins.

The primary low grade mineralization is disseminated within the foliation and in association with microfractures. Several examples show an association of granitic to quartzic small intrusions with the mineralization. The global trend of the primary mineralization is ENE/WSW. This trend is parallel to a former quartz breccias trend. No direct relation between breccias and mineralization has been observed. The secondary medium to high grade mineralization is associated with a late tectonic event. NNW/SSE faults are formed and the ENE/WSW silica breccias trend is reactivated by brittle faults cutting across the primary mineralization and oxidising fluids have remobilized it. Fractures with pitchblende are encountered around the main deformation fault zone and in association with

Red-Ox fronts surrounding the late faults. Red-Ox fronts and associated mineralization are also common along foliation and former ductile shear zones parallel to foliation.

3.3 Petrography, Mineralogy, and Mineralization

From Farkas (1984), Fuchs et al. (1986), and unpublished AREVA petrographic determinations, the mineralogical compositions of the various rock types are typically:

1. meta-arkose (fine- to medium-grained, psammopelitic to psammitic gneiss; impure/"dirty" quartzite)

Mineral	*Original*		*altered*
Quartz	30-50%		0-30%
Feldspar (plagioclase + K-feldspar)	30-50%		nil
Biotite/chlorite	15-30%	chlorite	5-40%
Muscovite/sericite	5-40%	illite/sericite	30-90%
Garnet	<5%		nil
Pyrite	<5%		<5%
Carbonate	<5%		<5%
Tourmaline	accessory		accessory
Zircon	accessory		accessory
Fluorite	accessory		accessory
Hematite	accessory		0-15%
Epidote	accessory		nil

2. Lone Gull granite (medium-grained, pinkish, non-foliated, holocrystalline-granular)

Mineral	*Original*		*altered*
Quartz	35-55%		5-40%
Feldspar	25-45%		nil
Plagioclase	15-25%		nil
Biotite/chlorite	15-25%	chlorite	5-40%
Muscovite/sericite	5-20%	illite/sericite	30-60%
Fluorite	accessory		accessory
Pyrite & Molybdenite	accessory		<5%
Carbonate	accessory		0-40%
Zircon & Titanite	accessory		accessory
Epidote	accessory		nil
Apatite	accessory		accessory

3. Chlorite-sericite schist

Quartz	10-30%
Quartz	70-90%

4. Metaquartzite (“orthoquartzite”)

Quartz	>98%
Sericite	trace
Andalusite	accessory

The Kiggavik mineralization is monometallic (U ± Au, Pt) and occurs in both metasediments and granite. The two major uranium minerals are pitchblende [UO2] and coffinite [USiO4(OH)4]. This mineralization is present as finely-disseminated granules located along foliation planes and/or as colloform aggregates and rosettes in veinlets parallel to the foliation. It is also found as fracture fillings and coatings along cross-cutting structures (Fuchs et al., 1986) and rarely in brecciated metasediments (Farkas, 1984). Fracture-controlled mineralization is more frequently observed in granite than metasediment. The uranium minerals are often associated with brownish Fe-oxide/hydroxides (hematite/limonite). Coffinite surrounds and replaces pitchblende. Gangue minerals are illite, with minor dusty hematite, and variable amounts of chlorite.

Secondary uranium minerals are uncommon, although fine-grained uranophane occurs in weathered rocks at surface and also occasionally at greater depth. Pitchblende and coffinite are often associated with and replace marcasite and pyrite. Other sulphides or accessory metals are present only in minor amounts, resulting in the monometallic composition characteristic of the Kiggavik ore zones.

4 Mine Rock Assessment Methodology

An investigation was initiated by AREVA and EcoMetrix to characterize the mine rock materials from the Kiggavik and Andrew Lake deposits, to assess the leaching behaviour and to compare the results with those from other uranium deposits in Northern Saskatchewan. The clean rock at Kiggavik and Andrew Lake was also investigated to ensure that water quality from potential construction material and on-land stockpiles will not be at risk.

The waste rock characterization study was conducted mainly in the laboratory and involved chemical analyses of the rock, including metal analysis, acid base accounting (ABA), humidity cell testing, customized leach tests to assess metal leaching, and column tests with submerged rock to evaluate the concentrations of metals in pore water for an in-pit disposal scenario. Four field cells were also constructed at the Kiggavik field camp to evaluate the leaching behaviour of the mine rock material under ambient site conditions with natural precipitation rates.

The mine rock assessment was completed in stages starting in 2006. Review of the waste rock assessment in the 1989 Environmental Assessment (Urangesellschaft, 1989) provided some basic information on "general" waste rock and ore conditions for a few samples. In addition to a review of existing reports, a site visit in July 2006 was completed, and samples of drill core segments from the selected core fragments from historic exploration activities in the 1980s and early 1990s were collected for preliminary screening analysis. The tests on those core samples were conducted by EcoMetrix.

Separate follow-up laboratory testing studies were completed by EcoMetrix and Saskatchewan Research Council (SRC). Testing was completed for both studies on drill core samples collected from AREVA's 2007 drilling campaign from the Andrew Lake (ANDW), End Grid (END), and Main Zone (MZ) deposits. As additional exploration drilling was completed in 2008 and 2009, further characterization of the projected mine rock was completed. The methods and procedures used for the assessment are discussed below.

4.1 Mine Rock Sampling

A total of 186 drill core samples from the 2007, 2008 and 2009 AREVA drilling campaigns were evaluated, including 51 samples from the Andrew Lake deposit, 42 samples from the End Grid deposit together with 55, 22 and 16 samples from the Main, Centre and East Zone deposits, respectively at the Kiggavik site (Table 4.1-1). Material used in the laboratory evaluation was provided by AREVA from 2007, 2008 and 2009 drilling campaigns and shipped to EcoMetrix. Additional rock core samples were collected by EcoMetrix from the core racks at the Kiggavik site in July 2009, and included samples from each of the 2007, 2008 and 2009 drilling campaigns.

The rock material was examined and assessed according to the drill core sample location, such that the Kiggavik rock encompassed all the Main, Centre, and East Zone samples, and the Andrew Lake rock was characterized by only Andrew Lake deposit samples. The samples collected from the End Grid deposit were characterized separately from the Main Zone and Andrew Lake waste rock. The End Grid rock will originate from an underground mine where much of the material will likely remain or be backfilled below ground, and therefore will not need to be managed on surface. Geochemical characteristics of the Kiggavik and Andrew Lake rock material are summarized and discussed separately to better understand the two mine site's geochemical characteristics. However, testing methods were the same for both the Kiggavik and Andrew Lake material.

4.2 Testing Methodology

The mine rock characterization study involved chemical analyses of the mine rock, including bulk metal analysis and acid base accounting (ABA), humidity cell testing, customized leach tests, and column tests. The humidity cell tests were aimed at assessing the leaching properties of the mine rock materials for scenarios of use in construction and above ground stockpile disposal. The customized leach tests included shake flask testing and modified-Special Waste Extraction Procedure (SWEP) tests of the mine rock material to evaluate initial inventories of soluble constituents. The column tests were performed to evaluate the geochemical properties and leaching behaviour of the materials that will be relocated to the pits for permanent underwater storage after mining ceases.

In addition to the laboratory tests, four field cells were constructed at the Kiggavik field camp to evaluate the leaching behaviour of the mine rock material under ambient site conditions with natural precipitation rates. The four field cells had rock materials from either the Main Zone, Centre Zone, End Grid, or Andrew Lake deposits. The four cells were constructed such that any precipitation could enter the top of the cell and percolate down through the material, where the leachate was collected from a bottom drain and sampled for analysis.

4.2.1 Solids Characterization

Rock samples were submitted to either ALS Chemex in Vancouver, BC or SRC Analytical in Saskatoon, SK for analyses that included ABA and metals assays. The ABA analyses included determination of neutralization potential (NP), acid generation potential (AP), total sulphur (S_T), sulphate sulphur (S_{SO4}), sulphide sulphur (S_{S2-}) and inorganic carbon content. Metals content analyses included multi-element determination by four acid near-total digestion followed by ICP-MS quantification.

4.2.2 Leachability Testing

Several assessments and characterization studies of uranium deposits in the Athabasca region of Northern Saskatchewan have shown that some mine rock can be a source of acid and metals as a result of sulphide mineral oxidation if the rock is deposited on land. However, studies have also shown that the same rock can be a source of elevated arsenic concentrations when deposited under water, a mitigation measure intended to eliminate sulphide mineral oxidation and consequent acid generation. The effects and implications of arsenic leaching from mineralized mine rock associated with several deposits in the Athabasca basin have been evaluated and reported on in several studies (Cogema and CLMC, 2001; Cogema, 2004; Areva, 2007). Those studies identified a relationship between the soluble arsenic that can dissolve in pore water when the rock is flooded and the arsenic content of the solids. A relationship between the arsenic content of the rock and the "equilibrium" concentration of arsenic in the pore water was also demonstrated.

The initial rock samples from the Kiggavik and Andrew Lake deposits submitted to EcoMetrix in 2007 were therefore evaluated in a manner that was consistent with the leach test protocol for mine rock from the Athabasca Basin. Samples were crushed to less than 2.5 cm (1 inch) prior to testing. The leach tests generally used the standard Special Waste Extraction Procedure (SWEP), with a water:solids ratio of 20:1. The leach solutions were occasionally agitated, with sampling and leachate replacement taking place at 48 hour intervals, according to the following steps:

Leach 1: Distilled Water (at t = 48 hrs)
Leach 2: Distilled Water (at t = 96 hrs)
Leach 3: Phosphoric Acid, pH 5 (at t = 144 hrs)
Leach 4: Phosphoric Acid, pH 5 (at t = 192 hrs)

The concentration of phosphate in the solution of Leach steps 3 and 4 was approximately 200 mg/L. Sodium hydroxide was added to some samples during the phosphoric acid leaching step in order to maintain the solution pH between 5.0 and 5.5.

After each leaching step, leachate samples were filtered and preserved for analysis as appropriate, prior to laboratory submission. The pH and conductivity were measured immediately after sample collection. After completion of the leach tests, the remnant leached solids were analyzed.

The results for most constituents of potential concern in the leachate were below detection. Therefore, a second set of leach tests on selected core segments was conducted at a 3:1 water:solids ratio. The 3:1 water:solids ratio was used in order to limit dilution and provide better detection of COPCs in the leachate. The leach tests and sampling procedures were conducted using the same procedures as described above, with the exception that the remnant solids were not analyzed.

The results of the initial leaching tests suggested that the mine rock from the Kiggavik and Andrew Lake sites did not appear to have similar arsenic leaching issues as the other materials from the Athabasca region. This early finding prompted an adjustment in the leachability tests such that the remainder of the samples submitted to EcoMetrix for evaluation were subjected to a modified-SWEP test that consisted of one water leach only, following recommendations for mine rock evaluations (Price, 1997; 2009).

The findings from the initial SWEP tests provided, at an early stage, the overall investigation with information that was used to determine the mine rock criteria for segregation, as well as a partial rationale for subsequent geochemical tests.

4.3 Kinetic Tests

Static testing provides an indication of the total and soluble constituent concentrations in the mine rock materials at a particular time, but does not provide an indication of potential changes with time during mining operations or after mine closure. Kinetic testing can be used to provide information on the relative rates of acid generation, neutralization, the approximate timing for the onset of acid generation, if it is predicted to occur, as well as potential drainage chemistry and downstream loadings from the mine rock material as a result of metal leaching in the presence or absence of acidic drainage.

4.3.1 Humidity Cell Testing

Kinetic testing was completed on composite rock samples for the Kiggavik and Andrew Lake deposits. Composite samples, based on total sulphur and uranium content, were prepared from the drill core samples as shown in Table 4.3-1. Each test cell contained approximately 1.0 kg of the material and was flushed weekly with 1.25 L of distilled water. Samples of leachate were collected approximately two hours after initial inundation, and were then filtered and preserved accordingly prior to submission to the laboratory for analysis. Measurements of pH and conductivity were completed on the leachate immediately after collection, but prior to filtering and preservation.

Leachate samples from the initial rinse, week 2 and week 20 from each of the humidity cells were also submitted for radionuclide analysis by Becquerel Laboratories, Inc. in Mississauga, ON, including thorium-230 (Th-230), radium-226 (Ra-226), lead-210 (Pb-210), and polonium-210 (Po-210). The Th-230, Ra-226, and Po-210 concentrations were quantified by alpha-particle spectrometry, and the Pb-210 concentration was quantified by gas-flow proportional counting.

4.3.2 Column Testing

Two column tests were also initiated to examine the geochemical characteristics of the potentially problematic Kiggavik and Andrew Lake rock material in an underwater storage scenario. Each column test was designed to assess the material's influence on pit water quality after the material is backfilled to the pit and submerged. The two columns were filled with approximately 7.6 kg and 5.8 kg of selected rock cores from the Kiggavik and Andrew Lake rock, respectively (Table 4.3-2). Each column was then completely filled with distilled water. Water in each column was circulated through the rock material prior to sampling to produce a sample that represents the pore water within the submerged material. Leachate samples were collected weekly. For the initial three weeks of testing, a 0.12L water sample was collected to verify that COPC concentrations would be quantifiable, after which a 1.0 L water sample was collected after it was determined that 1.0 L could be removed, and subsequently replenished with distilled water without diluting the sample to below laboratory detection limits. Samples were filtered (0.45 µm) and preserved with nitric acid prior to submission to the laboratory for analysis. All water samples were submitted to ALS-Vancouver for analysis. The pH and conductivity of the samples were measured on the leachate immediately after collection.

Radiological analyses were completed on the leachate to confirm the low concentrations expected in the leachate. Radiological analysis requires large sample volumes and therefore, only leachate samples from Day 17 of each of the two column tests were submitted for radiological analysis, including Th-230, Ra-226, Pb-210, and Po-210. Two solids samples of the composite material that make up each of the columns were also submitted for radionuclide analysis, including Th-230, Ra-226, and Pb-210 by gamma-ray spectrometry. As part of the gamma-ray spectrometry analysis, Th-234, U-235, Th-227, Ra-223, Ra-228, and Th-228 were also quantified, where Ra-228 was estimated from actinium-228 (Ac-228) and Th-228 was estimated from Pb-212. Due to limitations at Becquerel Laboratories, and the high natural occurring activity of the samples, the samples could not be appropriately prepared for Po-210 analysis. However, the Po-210 concentration can be estimated based on secular equilibrium with Pb-210 after several months.

Two replicate column tests were designed and performed to simulate the storage of Type 3 rock above tailings that is proposed at the Kiggavik site (Attachment F). Type 3 rock was placed above a layer of tailings and deionized water was added to cover the rock with a water column above the rock surface. Two sampling ports were installed in the colunms to allow the collection of pore water at the tailings-rock interface and within the rock layer. The water column was sampled weekly and the sample volume was replaced with deionized water to maintain the water cover over the rock. The results from the column tests were assessed to estimate that rates of release of the COPCs from the rock-tailings storage scenario and the conservatively predict the effects on surface water quality after closure of the TMF facility.

4.3.3 Field Cell Tests

Four field cells were constructed in July 2009 at the Kiggavik field camp. The cells were intended to represent larger scale humidity cells, which were exposed to the ambient environment and natural precipitation to assess *in situ* leaching rates. These cells were constructed using half of a clean 170 L barrel and were filled with whole drill core segments ranging from 10 to 50 cm in length (Figure 4.3-1). The top of each cell remained open so that rock samples were exposed to air and to precipitation falling as rain or snow. Each barrel has a bottom drain spout connected with tubing to pails in which the water collects between sampling events. Selected drill core segments were placed in each barrel to represent rock material from four of the five proposed deposits, namely Main Zone, Centre Zone, End Grid, and Andrew Lake (Attachment A). No field cell was constructed using East Zone deposit material due to the lack of availability of sufficient material. The total rock mass in each cell ranged from about 39 kg to 51 kg.

Sampling of the collected leachate from each field cells was completed by AREVA personnel on three separate occasions; in August 2009 representing approximately 4 weeks after cell construction; in November 2009 just prior to closure of the field camp for the 2009 winter season and representing approximately 6 weeks after cell construction; and once more in July 2010. Water samples were submitted to SRC in Saskatoon, SK for laboratory analysis.

4.3.4 Loading Rate Calculations

Loading rates derived from humidity cell and column tests were transformed into field loading rates by taking into account conditional differences between the laboratory and field settings. In general, the specific surface area of rock particles, temperature and freezing conditions should be considered for modifying the loading rates observed in laboratory humidity cell tests. Therefore, the humidity cell test results were adjusted to account for temperature and grain-size (or surface area).

A temperature correction factor for the humidity cell test results is required because the testing was completed at room temperature (20 to 25°C) while temperatures under field conditions for the stockpile will be approximately equal to the average air temperature at the site. The average temperature at the Kiggavik and Andrew Lake sites was estimated to be 5°C for eight months of the year and 0°C for the remaining four months. Oxidation of sulphide minerals such as pyrite, are temperature dependent, as described by the Arrhenius equation:

$$\ln\left(\frac{k_1}{k_2}\right) = \frac{E_a\left(T_1 - T_2\right)}{RT_1T_2}$$

where k_1 and k_2 are reaction rates at temperatures T_1 and T_2 in Kelvins, E_a is the activation energy of the reaction (J/mol), and R is the universal gas constant (8.314 J/mol/K). The values of E_a

for pyrite oxidation reactions, that are likely responsible for releasing metals, have been shown to be about 80 kJ/mol (Nicholson *et al*., 1988). Therefore, a temperature difference from laboratory temperature (20°C) to field temperatures, where field temperatures were assumed to be 0°C for eight months and 5°C for four months would result in a difference factor of about 9 in the reaction rate. Estimated metal loads from the stockpile (field loads) therefore include a correction factor of 0.117 (or about 1/9) applied to the calculated laboratory loading rate.

The second correction factor applied to the loadings estimates accounts for the fine grain size of the rock samples used in the humidity cell tests. The fine-grained material should contribute essentially all of the leached constituents from the mine rock pile, based on a unit mass basis because of the large surface area in the fines. A qualitative grain size analysis was estimated on all 11 of the humidity cells. The findings from the seven Kiggavik humidity cells and the four Andrew Lake humidity cells were then averaged separately to get an estimated surface of the mine rock material from the two sites. The estimated surface area of the mine rock material from the two sites was used to establish a representative factor designed to account for the difference in material size from lab testing and actual field conditions. It was observed that the Kiggavik rock material is more competent and less friable than the Andrew Lake rock material. This observation has been noted in various laboratory investigations including the humidity cell tests, and correlates with geotechnical results for the site as discussed below. Therefore, based on these observations and to maintain a conservative approach to loading estimates, it was assumed that 5% of the material that makes up the Kiggavik rock stockpile will be of similar size to the material tested in the humidity cells (less than 1" to silt/clay size), whereas 20% of the material that makes up the Andrew Lake rock stockpile will be similar to the actual laboratory size distribution. Therefore, a factor of 0.05 was applied to the Kiggavik laboratory loading rates and a factor of 0.20 was applied to the Andrew Lake laboratory loading rates based on the assumption that only 5% and 20% of the Kiggavik and Andrew Lake stockpiles, respectively, are comprised of similar sized material as in the humidity cells.

The loading rates for the in pit storage of Type 3 rock over tailings were evaluated separately (Attachment F). The dominant mechanism for the release of COPCs from the rock-tailings deposits in the backfilled pit will be the diffusion of dissolved costituents upward from the surface of each material into the fresh water layer in the active zone near the the ground surface. Therefore, the column test results were interpreted to define the diffusion coefficients of the COPCs that were then used to calculate the expected diffusive fluxes of COPCs in the proposed in-pit disposal scenarios. Conservative assumptions were applied to variables such as diffusion travel path lengths, concentration gradients and maximum expected concentrations of COPCs in the porewaters of the tailings and submerged Type 3 rock.

The maximum steady state flux of a COPC was calculated using Fick' First Law that is given as;

$$F = D_e (C_{pw} - C_{sw})/Z$$

in which D_e is the effective diffusion coefficient in the pore water, C_{pw} is the COPC concentration in the pore water of either the tailings or Type 3 mine rock, C_{sw} is the COPC concentration in the shallow water at the water table and Z is the thickness of the Type 1 or 2 mine rock overlying the tailings or Type 3 rock.

The flux represents the mass (mg) of COPC that migrates up though the Type 1 or 2 mine rock across a horizontal area (square metres) per unit time (second). The total rate of mass transferred up to the top of the clean rock is therefore the flux multiplied by the total area of the top of the rock layer, given as mass (mg) per second. This mass is transported to the water flowing through the upper layer near ground surface that is a function of the rate of infiltration of rain and snowmelt. The mass that is transferred to the active flow zone will then mix with the shallow infiltrating water and therefore, the mass transfer rate can be divided by the infiltration rate to estimate the resulting concentration in the shallow water migrating horizontally through the pit. The resulting concentration of any COPC in the shallow water leaving the pit footprint is give by;

$$C_{sw}=(F \times A)/Q$$

In which A (m^2) is plan area of the pit at surface and Q is the flow (m^3/s) out of the pit through the shallow subsurface.

Direct precipitation to the in-pit TMF was conservatively assumed to be the only source of water available to assimilate the flux of COPCs from the tailings and mine rock at the surface of the flooded pit. Additional water inflow sources such as local surface runoff would serve to further reduce predicted concentrations but were not considered in this assessment in order to remain conservative.

5 Mine Rock Characterization

Initial testing of the Kiggavik and Andrew Lake mine rock was completed based on characterization studies of uranium deposits in the Athabasca region of Northern Saskatchewan. Material was either classified as “Type 1 or 2” or “Type 3”. Results of preliminary testing of the Kiggavik and Andrew Lake material were used to better categorize the mine rock material.

A summary of the ABA analyses and metals contents for each deposit is provided in Table 5.1-1. The distributions of metals with depth are also provided in graphical format in Figure 5.1-1 for selected metals. Evaluation of the ABA analyses is provided in Figure 5.1-2 as NP vs AP and NP/AP vs depth plots.

The results of the SWEP tests for selected metals are presented in Table 5.1-2 as values of the equivalent mass of metal leached per mass of solids in units of mg/kg and percentage of the total inventory leached.

Complete results for both solids and SWEP analyses are provided in Attachment C.

5.1 Solid Content and Acid Generation Potential

5.1.1 Kiggavik Mine Rock Material

Main Zone Deposit

Concentrations of most constituents of concern were below the screening criteria of ten times the average crustal abundance in the Main Zone Deposit samples. Arsenic concentrations were generally consistent, with a geometric mean value of about 0.7 mg/kg and only 14 of the 55 samples had arsenic concentrations above 1 mg/kg. Uranium concentrations ranged between 2.8 and 818 mg/kg, with a mean value of about 23 mg/kg. No discernable trends in uranium or arsenic contents were noted with depth. Copper concentrations ranged between 2 and 245 mg/kg. Mean concentrations of cobalt, lead, molybdenum and zinc were about 9.3 mg/kg, 29.2 mg/kg, 13.8 mg/kg and 25.3 mg/kg, respectively exhibiting no trends with depth. Nickel concentrations generally ranged from 1.3 to 116 mg/kg, with a mean value of about 20.1 mg/kg while the concentrations of selenium ranged from 1 to 7 mg/kg, with a mean concentration of 1.3 mg/kg. Cadmium concentrations were generally below or near detection. The detection limit for cadmium for some of the 2008 drill hole samples was elevated, with results reported at less than 1 mg/kg.

Results of ABA testing on the Main Zone deposit samples suggest that the majority of the material appears to be non-acid generating; however acid generation could be a risk in some materials. The mean NP and AP values for Main Zone samples were about 13.6 and 3.9 kg-$CaCO_3$/t, respectively, with paste pH values between 7.2 and 9.3. The NP/AP ratios ranged from 0.2 to 240, with a geomean of 2.8. Of the 55 samples analyzed from the Main Zone deposit, 40 samples had NP/AP ratios greater than 1, with 20 samples having NP/AP ratios greater than 4 (Figure 5.1-2). Samples that exhibited NP/AP ratios of less than one generally also exhibited sulphur contents greater than 0.5%. The Main Zone samples, exhibited some of the highest sulphide contents of all samples, with 34 of 55 samples exceeding 0.1% sulphide and 4 samples exceeding 1% sulphide.

Centre Zone Deposit

The mean arsenic and uranium contents were 1.6 and 10.8 mg/kg, respectively and ranged from 0.6 to 12.5 mg/kg for arsenic and from 2.5 to 500 for uranium. For both arsenic and uranium, the higher concentrations were typically observed at shallower depths. The concentration of copper ranged from 1.7 to 182 mg/kg, with a geometric mean concentration of about 17 mg/kg. Geometric mean cadmium, cobalt, lead, molybdenum, nickel and zinc concentrations were about 0.03 mg/kg, 11 mg/kg, 18 mg/kg, 5.6 mg/kg, 33 mg/kg and 35 mg/kg, respectively.

The ABA results for the Centre Zone samples were generally had similar range in values as the Midwest Zone samples. Core samples from the Centre Zone had laboratory paste pH values ranging from 7.4 to 9 with a mean value of 8.4. Neutralization potential values averaged 12.2 kg-$CaCO_3$/t. Total sulphur contents ranged from 0.01% to 1.83%, with a geometric mean value of 0.12%, and were predominantly in the sulphide form. Half of the samples (11 of 22) had total and sulphide sulphur contents greater than 0.1%, with 8 samples (36%) having sulphide contents greater than 0.5%. The AP contents of the samples ranged from 0.3 to 57 kg-$CaCO_3$/t, with a geomean value of 3.7. The NP/AP ratio averaged 3.3, with 11 of 22 samples having ratios less than 3 resulting from the elevated sulphur contents (Figure 5.1-2).

East Zone Deposit

The uranium content of the East Zone mine rock samples were lower than those from the other deposits, ranging from 1.9 to 9.2 mg/kg with a mean content of 4.2 mg/kg (Figure 5.1-1). Arsenic concentrations ranged from 0.2 to 5.3 mg/kg with an average of 0.6 mg/kg. Cobalt concentrations generally ranged from 8.2 to 31 mg/kg, with a mean value of about 14 mg/kg while the concentration of copper ranged from 4.4 to 148 mg/kg, with a mean concentration of 30 mg/kg. The concentration of cadmium ranged from less than 0.02 to 0.09 mg/kg, with the exception of one core sub-sample taken from the depth interval 63 to 63.1 m that measured 2.54 mg/kg. This sample also exhibited elevated arsenic, lead and zinc contents in comparison to the other East Zone samples. Geometric mean concentrations of lead and molybdenum were about 10 mg/kg and 0.8 mg/kg, respectively,

with concentrations of nickel ranging from 16.3 to 53 and concentrations of zinc ranging from 33 to 567 mg/kg.

Laboratory measured paste pH values were above 7.5 in all East Zone samples. The NP values ranged from about 6 to 19 kg $CaCO_3$/t with AP values between 0.3 to 18 mg/kg $CaCO_3$/t, resulting in NP/AP ratios between 0.8 and 43. The mean NP/AP ratio was 7.7, with 6 of the 16 samples (38%) having ratios less than 4. Sulphide contents ranged from 0.01 to 0.56%, with a geomean of 0.04% (Figure 5.1-2).

5.1.2 Sissons Mine Rock Material

Andrew Lake Deposit

The geomean concentrations of constituents of potential of concern in the Andrew Lake samples were below the screening criteria of ten times the average crustal abundance values, with the exception of arsenic, uranium and antimony. The range in arsenic concentration in the Andrew Lake core sample segments was between 0.3 and 56.9 mg/kg with a mean concentration of 3 mg/kg, with the elevated concentrations generally found at shallower depths. In general, the concentrations of uranium ranged between 0.9 and 452 mg/kg with a mean concentration of about 17 mg/kg. Mean concentrations of cobalt, copper, nickel and zinc were 3.6 mg/kg, 6.6 mg/kg, 28 mg/kg, and 12.9 mg/kg, respectively. The mean lead and molybdenum concentrations in the core segments were 9.3 and 0.7 mg/kg with a mean concentration of 0.3 for antimony.

The results of the ABA analysis of Andrew Lake samples indicate that most of the rock material is not likely acid generating, as 40 of the 51 samples (78%) had NP/AP ratios above 4, with only 2 samples (4%) having NP/AP ratios less than 1. The mean NP/AP ratio was 9.9. The neutralization potential (NP) values ranged from 1 to 30 kg-$CaCO_3$/t with a mean paste pH of the samples of 7.5. Sulphide contents were low and ranged from 0.01 to 0.2%, with a geomean of 0.01%. However, only 8 of the 51 samples had a sulphide content greater than 0.02%. Acid generation potentials (AP) values ranged between 0.3 and 6.3 kg-$CaCO_3$/t.

End Grid Deposit

The metal contents in the End Grid samples were similar to those in the Andrew Lake materials (Table 5.1-1). The geometric mean concentration of arsenic in the End Grid core segments was 2 mg/kg. Uranium concentrations ranged from 1 to 30 mg/kg, with the exception of one core sub-sample taken from the depth interval 341.5 to 341.76 m that measured 1,370 mg/kg. The concentration of cobalt ranged from 1.3 to 113 mg/kg, with an geometric mean concentration of 6.5 mg/kg. Geometric mean copper, lead and molybdenum concentrations were about 7.8 mg/kg, 5.9 mg/kg and 0.8 mg/kg, respectively. Nickel and zinc concentrations measured in the solids ranged

between 4.4 and 209 mg/kg and 2 and 120 mg/kg, respectively, with geometric mean values of 25.3 mg/kg and 19.4 mg/kg, respectively.

The ABA results for the End Grid samples were on average similar to those in the Andrew Lake materials. Laboratory paste pH values for the End Grid samples ranged from 6.9 to 8.9, with a geometric mean NP value of about 8.0 kg-$CaCO_3$/t. Samples generally had low sulphur contents, with 36 of the 42 samples (86%) having total and sulphide contents below 0.05%. The resulting AP values ranged from 0.3 to 35 kg-$CaCO_3$/t, with a geomean value of 0.6 kg-$CaCO_3$/t. Neutralization potential values ranged from 1 to 82 kg-$CaCO_3$/t, with a geomean of 8 kg-$CaCO_3$/t. The NP/AP ratios ranged from 0.6 to over 200 with a geomean of 13. Over 80% of the samples (35 out of 42) had NP/AP ratios above 4.

5.2 Metal Leaching (SWEP)

5.2.1 Preliminary Leachability Screening

Leach tests completed on the initial batch of rock samples submitted to EcoMetrix in 2007 were focused on metal leaching with an emphasis on arsenic release, similar to that observed for the uranium deposits in the Athabasca region.

The results of the preliminary leach tests for arsenic are presented in Table 5.2-1. Results for additional COPCs are provided in Attachment C. The values represent the equivalent mass of arsenic leached per mass of solids and are presented in units of mg/kg. The values for the total leached concentration of arsenic from the samples were determined as the sum of the leached arsenic concentration measured after each leaching step. The quantities of arsenic leached were also compared to their total concentrations in solids and the results are presented as percentages in Table 5.2-1. Where concentrations were below detection in the leach extract, calculations assumed that values that were reported as less than detection were equal to zero. Complete results are presented in Attachment B.

With the exception of a few leachate samples, arsenic concentrations were below detection in tests for both the 20:1 and 3:1 evaluations. The mean water and total leachable masses of arsenic were 0.02 and 0.04 mg/kg, respectively, representing a maximum value of about 2% of the total arsenic inventory of the samples.

The results of the initial leaching tests suggested that the mine rock from the Kiggavik site did not appear to have similar arsenic leaching issues as the materials from the Athabasca region. Therefore, the remainder of the samples submitted to EcoMetrix for evaluation were subjected to SWEP testing that consisted of one water leach only.

5.2.2 Kiggavik Mine Rock Material

Main Zone Deposit

Table 5.1-2 provides a summary of the SWEP testing for selected parameters. The pH of leachates from the SWEP testing on Main Zone samples ranged from 3.4 to 7.8 with a mean value of 6.0. Leachable concentrations of antimony, cobalt, nickel and lead were typically below detection. Arsenic and uranium leachability ranged from 0.003 to 0.05 mg/kg and 0.014 and 15 mg/kg, respectively with mean values of 0.007 mg/kg for arsenic and 0.043 mg/kg for uranium. The leachable concentrations represent between 0.1 and 17% of the total arsenic inventory and between 0.05 and 15% of the total uranium inventory. Mean leachable copper, molybdenum and zinc concentrations were 0.006 mg/kg, 0.07 mg/kg and 0.013 mg/kg, respectively, representing less than 0.1% of the total copper and zinc inventories and about 0.3% of the total molybdenum inventory. Cadmium was typically below detection in leachate samples with the exception of the samples from the 2008 program. Leachate concentrations ranged from less than 0.0003 to 0.06 mg/kg.

Centre Zone Deposit

The results of the SWEP analyses were similar to the Main Zone samples, with leachable concentrations of antimony, cadmium, cobalt, nickel, lead and zinc typically below detection. Leachate pH values were generally neutral with only 1 of the 22 samples exhibiting a leachate pH less than 5. Concentrations of uranium were detected in only 4 of the 22 samples, ranging from 0.05 to 0.44 mg/kg, representing 0.1 to 0.9% of the total uranium inventories. Arsenic leachability ranged from below detection to 0.06 mg/kg, or between less than 0.1% and 2.9% of the arsenic inventories. Mean leachable copper and molybdenum concentrations were 0.006 mg/kg and 0.014 mg/kg, respectively, representing about 0.04% and 0.3% of the total copper and molybdenum inventories, respectively.

East Zone Deposit

Leachate pH values from SWEP tests on East Zone material averaged 5.9. The mass of arsenic leached for the samples ranged from about 0.004 mg/kg to 0.04 mg/kg, with a mean leachable arsenic content of about 0.004 mg/kg. These masses represent a mean leachable fraction of less than 1% of the total arsenic inventory. The mean leachable mass for molybdenum was about 0.004 mg/kg representing about 0.5% of the total inventory. Leachable masses for other metals of concern, including antimony, cobalt, copper, lead, nickel, uranium and zinc were generally below detection.

5.2.3 Sissons Mine Rock Material

Andrew Lake Deposit

The pH of leachates from the SWEP testing on Andrew Lake core samples ranged from 3.6 to 7.3 with a mean value of 5.8. Arsenic and uranium leachability ranged from below detection to 0.014 mg/kg and below detection to 3.8 mg/kg, respectively with mean values of 0.005 mg/kg for arsenic and 0.03 mg/kg for uranium. The leachable concentrations represent less than 0.01% to 1.4% of the total arsenic inventory and less than 0.01% to 2.2% of the total uranium inventory. Mean leachable copper, molybdenum, nickel and zinc concentrations were 0.006 mg/kg, 0.009 mg/kg, 0.007 mg/kg and 0.015 mg/kg, respectively, representing less than 0.1% of the total copper and nickel inventories, 1.2% of the total molybdenum and about 0.13% of the total zinc inventories. Leachable concentrations of antimony, cadmium, cobalt, and lead were typically below detection.

End Grid Deposit

Leachate pH values from SWEP testing of End Grid rock cores exhibited some of the lowest values analysed for the Kiggavik project, ranging from 2.6 to 8.1 with a mean value of 5.5. The mass of arsenic leached for the samples ranged from below detection to 0.18 mg/kg, with a mean leachable arsenic content of about 0.01 mg/kg representing a geometric mean percentage of 0.5% of the total arsenic inventory. The mean leachable mass for copper was about 0.006 mg/kg representing about 0.08% of the total inventory. The mean leachable mass for molybdenum was about 0.01 mg/kg representing about 1.3% of the total inventory. Zinc concentrations averaged 0.014 mg/kg or 0.07% of the total zinc inventory. Leachable masses for other constituents of potential concern were generally below detection.

5.3 Geotechnical Properties

Geotechnical studies were conducted in order to develop geotechnical criteria for the purpose of mine design. A summary of the geotechnical properties for the Kiggavik and Andrew Lake zones, where the majority of the mine rock will originate from, is presented in Table 5.3-1 and Table 5.3-2.

Table 5.3-1 Geotechnical Parameters for Kiggavik Main Zone & Centre Zones

Rock Type	Alteration (SRM)	UCS (MPa)	Youngs Modulus (GPa)	Density (g/cm^3)	Poissons Ratio	RMR (1976)
Metasediments	Highly altered (W5)	21.8	6.6	2.37	0.01	46 to 66 (fair to good)
	Fresh (W1)	98.4 +/-26.1	44.6+/-6.3	2.69+/-0.10	0.17+/-0.02	62 to 71 (good)
Granite	Slightly to Moderately altered (W2 to W3)	55.9+/-27.0	23.9+/-18.2	2.42+/-0.22	0.10+/-0.03	62 to 76 (good)
	Fresh (W1)	112.3 +/- 28.5	45.1 +/- 3.4	2.64 +/- 0.05	0.15 +/- 0.01	
MPa=mega pascal, GPa=giga pascal, $g/cm^{3=}$grams per cubic centimeter						

Table 5.3-2 Geotechnical Parameters for Andrew Lake Zone

Rock Type	Alteration	UCS (MPa)	Youngs Modulus (GPa)	Density (g/cm^3)	Poissons Ratio	RMR (1976)
Metasediments <200 m depth	Low to Mod Alt (Af=1 to2)	29.9+/-13.2	11.3+/6.5	2.46+/-0.17	0.08+/-0.04	42 to 62 (fair)
	Mod. To High Alt (Af=3 to 6)	15.9+/-1.7	2.8+/-1.5	2.39+/0.17	0.09+/0.05	52 to 74 (fair to good)
Granite	Low to Mod Alt (Af=1 to 2)	66.5+/-20.4	22.4+/-2.5	2.53+/-0.10	0.15+/-0.02	52 to 65 (fair to good)
	Mod to High Alt (Af=3)	24.7	6.1	2.45	0.24	
Inferred Fault	Low to High Alt (Af=1 to 6)	7.4+/-3.5	1.4+/-1.4	2.03+/-0.08	0.05+/-0.01	42 to 52 (poor to fair)
Quartz Breccia	Low Alt (Af=1)	35.0	19.9	2.63	0.16	
MPa=mega pascal, GPa=giga pascal, g/cm^3=grams per cubic centimetre, Af=alteration factor						

The ore is found predominantly in the moderate to highly altered rock while most of the mine rock is expected to be comprised of weakly to moderately altered material.

The average joint spacings assumed for the Kiggavik Zones range from 0.7 m to 4.3 m. The average joint spacings estimated for Andrew Lake range from 0.5 m to 0.9 m.

Fragmentation

A fragmentation analysis was conducted to predict rock fragmentation in bench blasting (see Technical Appendix 2B “Drilling and Blasting Design and Related Regulatory Considerations”). The analysis suggests that proposed blast designs will produce greater than 95% passing for an upper limit of 1,000 mm diameter. Fragmentation is expected to be finer at Andrew Lake due to the decreased joint spacing and reduced rock strength.

6 Mine Rock Segregation

6.1 Criteria

The criteria used traditionally in the uranium mining industry to segregate clean waste from special waste and ore have been based on the uranium content. The definition of “Clean” mine rock for uranium deposits in Northern Saskatchewan has been primarily based on uranium concentrations less than 250 mg/kg (ppm), with arsenic and nickel serving as additional criteria for specific ore deposits that have elevated levels of those COPCs. Classification of Clean mine rock for the Kiggavik project was initially projected to be consistent with the Northern Saskatchewan deposits. However, results from the leachability (SWEP) testing were used to provide an assessment of additional criteria that would define mine rock that can be surface stockpiled, materials that can be used for construction and material that will require appropriate long term management.

The solids contents of most metals were generally very low. The leachable masses of most metals were also low. The low values and the lack of correlation between solid and leachable contents for metals such as arsenic, copper, molybdenum and nickel indicates that these parameters are not relevant to the classification of mine rock at the Kiggavik site (Figure 6.1-1). In addition, no correlations were present between uranium and the other constituents such as arsenic, copper, molybdenum or nickel (Figure 6.1-2).

Sulphur content however, appears to be a key parameter for the determination of problematic mine rock, particularly for the Main, Centre and East Zone materials. Mean total sulphur contents of material for these deposits were 0.15, 0.12 and 0.05% respectively, with a maximum value as high as 1.83% (Table 5.1-1). The mean and maximum total sulphur content for the Andrew Lake material was 0.02 and 0.21%, respectively.

There are no apparent correlations between uranium and total sulphur contents for either the Main Zone or Andrew Lake stockpile materials. However, comparison of total sulphur content and the ratio of neutralization and acid generation potentials (NP/AP) provides a preliminary screening criteria to evaluate problematic mine rock.

Out of the 87 samples evaluated during the laboratory investigation from the Main, Centre and East Zones that had uranium contents less than 250 mg/kg, 64 samples had a NP/AP value of 1 or greater, with 39 samples having a NP/AP value of 4 or greater (Table 6.1-1). Plots of NP/AP vs total Sulphur (Figure 6.1-3) suggest that all material with Total S less than 0.1% (36 samples) would have an NP/AP ratio greater than 1, and 34 of the 36 samples would have a NP/AP ratio of 4 or higher. If a total sulphur content of 0.2% is considered, then 37 of the 46 samples would have a NP/AP ratio of 4 or higher. A criteria of 0.3% total S results in 39 out of 57 samples having a NP/AP value above 4.

For Andrew Lake material, the majority of the samples with uranium contents less than 250 mg/kg had a NP/AP value of 1 or greater, with 36 out of 47 samples having a NP/AP value of 4 or greater (Table 6.1-1**;** Figure 6.1-3). Almost all of the samples with total S contents less than 0.2% exhibit a NP/AP ratio above 1. Ratios above 4 are noted for 36 of the 45, 46 and 47 samples with total S contents less than 0.1, 0.2 and 0.3%, respectively.

Results of the evaluation of total sulphur content as a preliminary screening criteria to evaluate problematic mine rock were similar if all samples are considered (i.e. samples with uranium contents greater than 250 mg/kg) because there were only a small number of samples with uranium contents above 250 mg/kg.

Based on static testing results, the proposed segregation criteria for mine rock at the Kiggavik Uranium Project are as follows:

Type 1: for clean rock that can be used as construction material (i.e., haul road, pad, etc.), it is proposed that concentrations of uranium be less than exemption quantities as per the Nuclear Safety and Control Act (1 Bq/g that equates to approximately 80 mg/kg based on the specific activity for U_{nat}) and have total sulphur content less than 0.1%;

Type 2: for mine rock that can be permanently stockpiled and managed above ground, it is proposed that uranium contents be less than 250 mg/kg and total sulphur content be less than 0.1%;

Type 3: for mine rock that requires specific management (e.g. in-pit disposal), it is proposed that all material not described above, or considered to be ore, be included in this category.

The classification of the samples that were tested can be seen graphically in Figure 6.1-4. These segregation criteria are consistent with waste rock management practices developed in Northern Saskatchewan.

6.2 Segregation

6.2.1 General

During open pit mining, mine rock will be segregated according to uranium grade as determined by radiometric scanning. Operational procedures will be used to ensure that Type 2 and Type 3 mine rock are effectively categorized, separated and transported to the appropriate disposal area. Segregation of mine rock will be based on the following:

systematic radiometric scanning of blast hole cuttings in clean rock zones to detect anomalous radioactivity levels;

systematic sampling of blast hole cuttings and if necessary analysis by the XRF method to detect anomalous metal content (e.g., uranium, arsenic);
radiometric probing of blast holes in ore zones to define ore/waste boundaries;
radiometric scanning of working faces during excavation to confirm blast hole scanning/probing results;
overhead scanning of mine rock in the proximity of Type 3 or ore once loaded onto trucks;
daily scanning of the Type 1 / 2 mine rock disposal area to ensure that no Type 3 mine rock or ore was inadvertently placed;
systematic sampling to assess acid generation potential of mine rock; and
if uncertainty as to classification exits, all questionable Type 1 or Type 2 mine rock will be considered as Type 3 for further disposal in the Main Zone and Andrew Lake open pits as a mitigation method.

The uranium content of mine rock is estimated in the field by radiometric techniques and subsequently confirmed with drill cutting assay results. In addition, XRF technology has been identified as a reliable field evaluation tool that can be used to directly determine potentially problematic metals in mine rock during mining. The XRF technology has greatly advanced in recent years, and it is generally accepted as a quantitative screening tool for environmental investigations and industrial site clean up activities.

The above measures were successfully used for mine segregation at the McClean Lake Operation and it is proposed to apply them during mining of the Kiggavik and Andrew Lake pits.

6.2.2 Grade Control

Grade control is the process of segregating mine rock and managing the quality and quantity of ore mined to ensure the delivery of the required ore tonnes and grade to the processing plant. Grade control is generally based on the detailed geological and grade information from blast holes or dedicated grade control drilling, interpreted to provide ore outlines for mining, production estimates, stockpile inventories and feed grades.

In Kiggavik, blast hole probing will be the main tool of grade control during the ore mining phase. Additional geological data will be collected as possible, to refine the geological model and improve the selectivity and resource estimation process.

Blast Hole Probing

Probing is the process of collecting a radiometric log of the blast holes and converting the radioactivity in equivalent uranium content. Probing has several advantages over conventional blast hole sampling; high density sampling, immediate results and grade interpretation, low cost and minimal operator exposure to harsh climates, radiation and dust.

Ore is exposed on the first bench in all pits, and therefore a grade control system must in place for start of mining operations.

The basic equipment for blast hole probing is a gamma probe, cable winch, data logger and laptop PC. The equipment is mounted in a probing vehicle, a tracked vehicle will be the most appropriate for the conditions, a 4x4 pick up truck will be less suitable to the anticipated conditions. A GPS system installed in the probe vehicle will be used for real time surveying during probing. The processing of probe data uses specialized software to download, compile and estimate ore, produce digline maps and transfer drill hole and block data to mine engineering and planners.

The probing will be conducted on a dedicated drilling grid, designed for grade control purposes and referred to as an ore grid. The grid spacing and orientation will be based on geological ore controls and mining equipment size. The ore grid will be located within the designed blast pattern from engineering development plans; however, the blast pattern may extend beyond the area of the ore grid. The grid location and extent will be based on the resource block model and existing drill holes and the ore grid data for those benches below the first bench. The grid will be placed in the field using GPS survey equipment and drilled with ~5 inch diameter drill holes, depending on hole stability. Once completed, the holes will be probed, if hole collapse occurs, the probing must follow behind the drilling. After completion of all probing, the data is downloaded, converted to equivalent uranium grade, the blast is estimated, and digline maps and coordinates are loaded into GPS units. Once all data is verified, the blast hole pattern will be stacked out, drilled and blasted. After the blast is shot and levelled, diglines are staked out and mining started. Ore mining will be conducted on 3 meter benches and loaded into ore trucks by excavator. Geological technicians will monitor the ore mining, ensure that each load has consistent type ore as possible and trucks are loaded to a consistent height. Technicians will use hand held GPS to follow mining and map daily progress for reporting and grade verification.

All trucks from the ore zone are scanned for classification and grade determination, the scanner will indicate the stockpile destination. Material scanned as waste from the ore zone will be classified as Type 3 mine rock, all ore will be classified into 3 stockpiles based on the scanner readings. The cut-offs will be determined by analysis of the grade distribution of the resource model in order to generate 3 classes with sufficient tonnage for adequate stockpiles and moderate grade variability. A record of all scanned trucks and the stockpile assignment will be saved to a file in the scanner digital logger unit and downloaded on a daily basis to a database. Daily production reports are generated from the database for distribution. The database is an integral part of the reconciliation and grade control process.

Geological Mapping

Geological mapping can contribute to the interpretation of the ore controls and improve the estimation and possibly indicate additional ore lenses. Mapping can also be important for improving

geotechnical and hydrogeological interpretations and warn of potential stability problems or water issues. As part of the geological component of grade control, pit wall mapping by bench will be carried out and blast hole cuttings logging completed to interpret the geology by blast. The data will be compiled on bench plans and used for ongoing mine planning, ore grid placement and geological interpretation. Due to extreme conditions, cold temperature and short days, the amount of geological mapping conducted may be limited.

Equipment and Support Considerations

Prior to start up, key equipment and systems must be in place to proceed to the mining stage.

Grade correlation for probes, a separate correlation may be needed for each area.

An ore truck scanner system must be designed, with appropriate considerations given to the conditions and truck size. The design must consider new technologies for radiometric detectors, weighing systems, truck positioning controls, data transfer and database development. A critical consideration is a sampling system for ore trucks to develop a grade correlation for the scanner.

Extreme weather and extended darkness may be a significant motivation for GPS guided excavators in ore mining. Digline boundaries can be loaded into digital block model maps in the GPS system of the excavator where the bucket position is indicated in real time. The ore can be mined according to the diglines where visual control may be poor or absent. An added benefit is maintain even floor level, for reduced truck wear and more precise volume measurement for production. A consideration for this system is the GPS satellite availability at this high latitude location.

Blast heave is often significant, may consider using blast movement indictors to measure and map the shift. This may be important in GPS guided systems where, maps can be generated with predicted blast movement for more accurate selectivity.

Geological mapping of cuttings could be done to develop a more detailed geological plan of the pit area, especially outside the main ore zones. This information may be used to help with the waste rock classification and monitor blasting performance by rock type.

Personnel

The grade control team will consist of geological technicians and geologists. The probing and sampling/analysis operations are time consuming and will require 2 technicians on a daily basis for the life of the pit. An additional technician will be required to monitor the ore mining operations, which is a more or less intermittent function. The requirements for technician involvement will however be dependant on the use of GPS machine guided systems for ore mining. With a GPS system the ore mining may require less direct monitoring, however would require more time for data processing and management. A geologist will be required for supervision, planning, data verification and interpretation, database maintenance, mapping and training of the on site geology personnel. As a

minimum, the grade control functions could be performed by 2 technicians and one geologist per shift on a rotation type schedule. A senior geologist position is also required to oversee the operations, set and improve operating procedures, provide direction and additional coverage as required.

A geotechnical specialist will be retained during the summer field seasons to review and complete as required, the wall mapping data in order to interpret the information from a geotechnical and hydrological viewpoint and assess the potential for problems as the pit is advanced.

7 Source Term Assessment

Because the mine rock assessment was completed in stages, initial testing was completed based on characterization studies of uranium deposits in the Athabasca region of Northern Saskatchewan. Material was either classified as “Clean Waste” or “Special Waste”. Results of preliminary testing of the Kiggavik and Andrew Lake material were used to better categorize the mine rock material. Therefore, independent testing was not always possible for the different waste categories. Results discussed below have been separated based on the updated characterization criteria, but may be limited due to completion of the testing prior to definition of the Type 1, 2 and 3 waste categories.

7.1 Type 1 Mine Rock

7.1.1 Kiggavik Rock Material

Kinetic testing on Type 1 Kiggavik rock material in the form of humidity cell tests was conducted on three composite samples with average uranium and total sulphur contents that categorize the material as Type 1 mine rock. The three humidity cells had a geomean bulk uranium content of 13.6, 35.1, and 8.2 mg/kg with corresponding total sulphur contents of about 0.01, 0.03, and 0.07 %S (Table 7.1-1). The leached COPC concentrations from the three humidity cell tests are shown as a function of time in Attachment D. It should be noted that dramatic drops in COPC concentrations illustrated at week 18, as shown in Attachment D**,** are a result of improved analytical detection limits that were implemented to enhance the sensitivity of the testing. Laboratory loading rates were calculated by using the steady-state COPC concentration demonstrated by the plateau in the COPC concentration as a function of time. The steady-state condition was considered to begin at week 20 for the various COPCs, where those leached concentrations were used in the loading rate calculations from week 20 to termination at week 36. The geomean of the loading rates calculated for each COPC for each of the three humidity cells was then calculated to represent the loading rate for the Type 1 Kiggavik rock. The calculated laboratory loading rates for each COPC are presented in Table 7.1-2.

There are several conservatisms inherent in the calculated laboratory loading rates, which will naturally translate to conservative values for the field loading rates. These conservatisms will impose influences on many calculations, such as pore water concentrations, assessments for amounts of construction material, and constituent loadings in the various management strategies. These conservatisms were considered in further detail in order to better understand the conservative nature of the calculated values. First, it is well known that some metals are pH sensitive and that concentrations of those metals will be controlled to low concentrations at neutral pH. The pH sensitive metals include Al and Cu. The loading rates of many other COPCs in the laboratory humidity cell tests represent maximum values because the concentrations in the leachate were

reported as less than the analytical detection limits. These COPCs include sulphate, As, Cd, Co, Ni, Pb, Sb, Se, V and Zn. Only Mn, Mo, Sr and U exhibited concentrations in leachate that were consistently above detection limits.

Initial flushes of COPCs were also calculated from the initial five weeks of testing, according to the assumption that oxidation products present on each of the rock sample's surfaces were washed off during the initial five weeks. This flushing phenomenon is depicted for sulphate in Attachment D, which provided a preliminary basis for making this assumption. The initial flush calculations were used to further enhance the understanding of the mine rock material characteristics in laboratory settings compared to the actual field setting.

The leachate collected from each of the three Type 1 humidity cells generally had circum-neutral pH values during the steady-state period with overall average pH values ranging from 5.5 to 5.9. The lowest individual pH was 4.5 and the highest was 6.6 during the steady-state period. The relatively lower pH values during the initial 12 weeks of testing, as well as variability from week to week, was determined to be caused by acid contamination during sample processing. Once this laboratory issue was noticed it was quickly remedied such that pH values after week 12 were not adversely affected.

There were no field cells constructed that contained material that would have been solely representative of the Type 1 Kiggavik rock because at the time of the initiation of field cells the segregation criteria had yet to be defined. Nonetheless, the two field cells that contain the Kiggavik rock material, namely Main Zone and Centre Zone material, are considered to be Type 3 Kiggavik rock according to their weighted total sulphur contents, and as such are discussed below for the Type 3 Kiggavik rock material.

7.1.2 Andrew Lake Rock Material

Two humidity cells contained material classified as Type 1 from the Andrew Lake deposit, with mean U-contents of about 12 mg/kg and 16 mg/kg and total sulphur contents of 0.01 and 0.03 %S, respectively. The loading rate for each COPC is presented in Table 7.1-2, where the loading rate was calculated from the geomean of the individual loading rates from the two humidity cells. Initial flushes of COPCs were also calculated from the initial five weeks of testing, according to the assumption that oxidation products present on each of the rock sample's surfaces were washed off during the initial five weeks. The initial flush calculations were used to further enhance the investigations understanding of the mine rock material characteristics in laboratory settings compared to the actual field setting.

The leachate collected from the two Type 1 Andrew Lake rock humidity cells had overall average pH values slightly more acidic than the circum-neutral range with overall averages of 5.45 and 5.50

during the steady-state period, as defined and discussed previously. The lowest individual pH value was 4.5 and the highest value was 6.5.

There was one field cell constructed with Andrew Lake rock material defined as Type 1 based on the weighted uranium and total sulphur average of about 17.9 mg/kg and 0.017 %S, respectively. The field cell was sampled five different times for which all COPC concentrations were quantified as above detection, with the exception of Cd in three of the five sample events and Cr in one sampling event. The results of the dissolved COPC concentrations were converted to mass of constituent leached per mass of material present in order enhance the understanding of the leaching behavior of the mine rock material. The total mass leached per total amount of material is presented in Table 7.1-3. The field cell COPC leached amounts were used to draw comparisons with the leaching rates calculated from shake flasks, modified-SWEP tests, and initial laboratory flushed quantities in order to better quantify the amount of leaching that will actually take place from the Type 1 Andrew Lake rock. The calculated leaching of the material in the field cells was used to compare to laboratory leaching results by taking into account different flushing rates and sizes (or surface area) of the material. Further analysis of the field cells, shake flasks, modified-SWEP tests, and initial laboratory flushes indicates that insufficient precipitation had entered the field cell material to remove oxidation products present on the rock surfaces. However, when differences in total amount of precipitation collected and surface area of the material is compared to laboratory tests the field cell constituent concentrations are generally consistent with predictions from adjusted laboratory rates (field rates).

7.2 Type 2 Mine Rock

7.2.1 Kiggavik Rock Material

Loading rates for the Type 2 Kiggavik rock mine materials were the same as the loading rates presented in Table 7.1-1 for the Type 1 mine material, as previously discussed. Furthermore, the field loading rates are summarized in Table 7.2-1 with the appropriate adjustments for temperature and surface area differences between laboratory and field conditions. The field loading rates were used to predict the total mass loadings from the mine rock pile as a whole, but also were used to predict pore water concentrations expected at the bottom of the mine rock stockpile. The pore water calculations and evaluation are completed in Section 9.2 as part of the long-term effects assessment of the Type 2 material with comparisons made to CCME aquatic freshwater guidelines.

7.2.2 Andrew Lake Rock Material

Loading rates for the Type 2 Andrew Lake mine rock materials were the same as the loading rates presented in Table 7.1-2 for the Type 1 mine rock material. The adjusted field loading rates are summarized in Table 7.2-1 based on correction factors for temperature and surface area differences between laboratory and field conditions. The field loading rates were used to predict the total mass

loadings from the permanently stored mine rock pile as a whole, but also were used to predict pore water concentrations expected at the bottom of the mine rock stockpile (Section 9.2).

There were no field cells constructed to specifically test the Type 2 Andrew Lake mine rock material, but because of the geochemical characteristics and leaching behavior previously discussed regarding the Type 1 and 2 similarities, the Type 1 Andrew Lake field cell findings were used to further expand of the Type 2 mine rock long-term effects. The long-term effects from the disposal of the Type 2 Andrew Lake mine rock material are evaluated and discussed in Section 9.2.

7.3 Type 3 Mine Rock

7.3.1 Kiggavik Rock Material

There were four humidity cells tested that contained the Type 3 Kiggavik mine rock material. The composite material in each of the four humidity cells had geomean U-contents of about 407, 15.8, 10.4, and 5.1 mg/kg with corresponding geomean total sulphur contents of 0.07, 0.18, 0.36, and 0.89 %S, respectively (Table 7.1-1). The loading rates for each COPC for the Type 3 Kiggavik mine rock materials were calculated from the humidity cell results during the steady-state period. The calculated loading rates from the four humidity cells were then geometrically averaged to produce a loading rate term for all expected Type 3 Kiggavik rock (Table 7.1-2) and adjusted for field conditions (Table 7.2-1**)**. The field loading rates were then used to calculate the predicted pore water concentration that will be produced by the temporary stockpile during operation, as well as the long-term loads from the in-pit disposal. The predicted pore water concentrations for all the COPCs, as they relate to the temporary stockpiles, as well as long-term evaluations are conducted in Section 9.3. Initial flushes of COPCs were also calculated from the initial five weeks of humidity cell testing, according to the assumption that oxidation products present on each of the rock sample's surfaces were washed off during the initial five weeks. The initial flush calculations were used to further enhance the investigation's understanding of the mine rock materials characteristics in laboratory settings compared to the actual field setting. The initial flushes from the humidity cell tests from the four Type 3 Kiggavik rock humidity cells are presented in Table 7.3-1.

The leachate collected from the four Type 3 Kiggavik rock humidity cells during the steady-state period had overall average pH values within the circumneutral pH range with overall averages ranging from 6.03 to 7.06. The lowest individual pH value was 5.48 and the highest value was 7.55 during the steady-state period.

The results from the radionuclide analysis on the leachate from the four Type 3 Kiggavik mine rock humidity cells from the three sampling events (Day 0, 14, and 140) are summarized in Table 7.3-2. The results from the radionuclide analysis on the leachate collected from the Type 3 Kiggavik column from the sampling event on Day 17 are also provided in Table 7.3-2.

There were two field cells constructed with material from the Kiggavik site that was classified as Type 3 mine rock material. One of the field cells that contained Type 3 mine rock material had rock core samples from the Main Zone deposit, which had a weighted U-content and total sulphur content of 17.6 mg/kg and 0.46 %S, respectively (Table 7.3-3). The other field cell with Type 3 mine rock material contained rock core samples from the Centre Zone deposit, which had a weighted U-content and total sulphur content of 30.1 mg/kg and 0.50 %S, respectively (Table 7.3-3). The two field cells were sampled five different times for which all COPC concentrations were quantified as above detection, with the exception of As, Cd, and Cr, which were quantified as less than detection for either the Main Zone or Centre Zone field cells during at least one sampling event. The results of the dissolved COPC concentrations were converted to mass of constituent leached per mass of material present in order enhance the understanding of the leaching behavior of the mine rock material. The total mass leached per total amount of material is presented in Table 7.1-3. The COPC masses leached from the two field cells were then averaged to get a value representative of the Kiggavik mine rock material as a whole, which are also presented in Table 7.1-3. These values were used to draw comparisons with the leaching rates calculated from leachability tests and initial laboratory flushed quantities in order to better quantify the amount of leaching that will actually take place from the Type 3 Kiggavik rock in the field. The calculated leaching of the material in the field cells was used to compare to laboratory leaching results by taking into account different flushing rates and sizes (or surface area) of the material. Further analysis of the field cells, leachability tests, and initial laboratory flushes indicates that the field cell material was probably not flushed enough to remove all oxidation products on the rock surfaces. However, when differences in total amount of precipitation collected and surface area of the material is compared to laboratory tests the field cell constituent concentrations are generally consistent with our predictions from adjusted laboratory rates (field rates).

The results of the column tests with submerged rock were evaluated to develop predicted concentrations of COPCs after relocating the rock to the pits and flooding of the rock after mining ends. Plots of dissolved COPC concentrations with time for the underwater column experiment containing the Type 3 Kiggavik mine rock material are presented in Attachment E. The pH of the leachate collected from the column remained relatively consistent throughout the test period, with ph values ranging from 6.6 and 7.7. For the most part, the COPC dissolved concentrations have slowly decreased during the duration of the testing, where it appears that steady-state conditions may have been reached for most COPCs after 20 to 30 weeks. However, dissolved concentrations of Al, Cr, Fe, and Pb continue to remain variable relative to each sampling event, and Al and Cr have actually demonstrated slight increases in concentrations since the initiation of the testing. Loadings from the solid to the pore water were calculated from the column experiment results and are summarized in Table 7.3-4. In general the loadings exhibit decreases with time or are steady with small positive values. These results will be incorporated into the source term for the backfilled pit that will contain tailings overlain by special waste and covered to surface by clean rock.

7.3.2 Andrew Lake Rock Material

There were two humidity cells constructed that contained the Type 3 Andrew Lake mine rock material. The composite material in the two humidity cells had geomean U-contents of about 297 and 18 mg/kg with corresponding geomean total sulphur contents of 0.02 and 0.16 %S, respectively (Table 7.1-1). The loading rates for each COPC for the Type 3 Andrew Lake mine rock materials were calculated from the humidity cell results during the steady-state period. The calculated loading rates from the four humidity cells were then geometrically averaged to produce a loading rate term for all expected Type 3 Andrew Lake mine rock (Table 7.1-2) and adjusted for field conditions (Table 7.2-1). The field loading rates were then used to calculate the predicted pore water concentration that will be produced by the temporary stockpile during operation, as well as the long-term loads from the in-pit disposal. The predicted pore water concentrations for all the COPCs, as they relate to the temporary stockpiles, as well as long-term evaluations are conducted in Section 9.3. Initial flushes of COPCs were also calculated from the initial five weeks of humidity cell testing, according to the assumption that oxidation products present on each of the rock sample's surfaces were washed off during the initial five weeks. The initial flush calculations were used to further enhance the investigation's understanding of the mine rock material characteristics in laboratory settings compared to the actual field setting. The initial flushes from the humidity cell tests from the two Type 3 Andrew Lake mine rock humidity cells are presented in Table 7.3-1.

The leachate collected from the two Type 3 Andrew Lake mine rock humidity cells during the steady-state period had overall average pH values of about 6.1 and 4.6. The pH range during the steady-state period for the humidity cell with the geomean total sulphur content of 0.02 %S was 5.7 to 6.8, whereas the pH range for the humidity cell with a total sulphur content of 0.16 %S was 3.9 to 5.9.

The results from the radionuclide analysis on the leachate from the two Type 3 Andrew Lake rock humidity cells from the three sampling events (Day 0, 14, and 140) are summarized in Table 7.3-2. The results from the radionuclide analysis on the leachate collected from the Type 3 Andrew Lake column from the sampling event on Day 17 are summarized in Table 7.3-2.

Plots of dissolved COPC concentrations in time for the underwater column experiment containing the Type 3 Kiggavik mine rock material are presented in Attachment E. The pH of the leachate collected from the column has remained relatively consistent throughout the testing ranging from pH values of about 7 to 8. The lowest pH was measured on the first day of sampling. For the most part, the COPC dissolved concentrations have slowly decreased during the duration of the testing, where it appears that steady-state conditions may have been reached for many COPCs by week 20. Loadings values were calculated from the column experiment data and are summarized in Table 7.3-4.

7.4 Type 3 Rock in the TMF

The Type 3 rock at the Kiggavik site that will be temporarily stockpiled during operations will then be relocated to the TMF facilities for permanent storage at mine closure. The Type 3 rock will be placed above the tailings and will be covered by either Type 2 or 1 rock to surface. The predicted concentrations in the shallow subsurface water leaving the pit are summarized in Table 5-2 of Attachment F.

8 Mine Rock Management Facilities

8.1 Volumes and Tonnages

A production rate for mine rock material has been estimated based on the proposed mine plan. Table 8.1-1 provides an estimate of material volumes. The "split" between Type 2 and Type 3 is considered a conservative estimate, such that the volume of Type 3 material is likely over-estimated. The overburden will be comprised mainly of frozen sand and gravel, and granite boulders with some zones of silt and glacial till. The clean overburden will be stockpiled for use in reclamation while the contaminated overburden, if any, will be disposed of within Main Zone Tailings Management Facility during decommissioning.

Table 8.1-1 Estimated Quantities of Mine Rock and Overburden Materials

	Situ Overburden (Mbcm)	In Situ Mine Rock (Mbcm)		Mine Rock Broken Estimates (Mm^3)		
		Type 1 + Type 2	Type 3	Type 1	Type 2	Type 3
Kiggavik						
Purpose Built Pit	0.1	0.35	-	0.3	0.1	-
East Zone	0.6	2.0	0.06	0.5	2.1	0.1
Centre Zone	1.8	4.6	0.1	1.2	4.8	0.2
Main Zone	3.0	21.3	0.3	5.5	22.1	0.5
Sissons						
Andrew Lake	3.3	33.1	0.5	8.6	34.4	0.8
End Grid		0.3	0.04	0.1	0.3	0.1

Notes:
Open pits: the volume/tonnages are at a cut off grade of 900ppm and post mining recovery
End Grid: the volume/tonnage are at a cut off grade of 2100 ppm and are post mining
In situ mine rock
Volumes are in million bank cubic meters (Mbcm), in situ volume prior to excavation
Mine rock broken estimates
Volumes are in million loose cubic meters (Mm^3)
A swelling factor of 1.30 is considered
A Type 1/ Type 2 ratio of 20% is considered for all deposits
A Type 1/ Type 2 ratio of 75% is considered for the Purpose Built Pit
Type 3 estimates conservatively include a 30% contingency

8.2 Temporary Stockpiles

8.2.1 Design

Kiggavik Site

Type 3 mine rock from the perspective of acid rock drainage and metal leaching will be segregated and temporarily stored during operation in a stockpile adjacent to the Main Zone pit. Runoff and water percolating through the temporary stockpile will be collected using ditches and a holding pond, such that the water can be recycled for use in the mill and/or treated before release. During decommissioning of the site, all Type 3 mine rock from the Kiggavik pits will be hauled and disposed of within the Main Zone TMF.

It is estimated that the volume of Type 3 mine rock from the Kiggavik Pits will fall within the range of 700,000 to 1,400,000 m³ (broken). The corresponding temporary stockpile will be located along the north perimeter of the pit. The planned footprint of the temporary stockpile at Kiggavik is approximately 12 ha.

The design for the Type 3 waste rock pad for Kiggavik includes a single liner system and the corresponding sedimentation pond includes a double liner system. Due to the permafrost foundation conditions, the liners are required to be constructed on a rockfill pad. The pad footprints will be stripped of organic materials and ice rich soils (soils containing ice lenses or high ice contents) which may be prone to creep when loaded. Excavations in permafrost ground will be covered immediately using Type 1 mine rock fill to prevent permafrost degradation. Fill material will include non-potentially acid generating free draining rock materials. The minimum thickness of the rock pad will be 1.5 m. The pad grading will be designed to drain into the sedimentation ponds.

Typically the pad will include the following layers (from top to bottom):

1. Transition layer of 100 mm minus rockfill;
2. Cover sand over liner;
3. Non-woven filter cloth as cushion between sand cover and liner.
4. 80 mil HDPE or LLDPE liner;
5. Non-woven filter cloth as cushion between sand bedding and liner;
6. Base sand/liner bedding-as above;
7. Transition layer of 100 mm minus rockfill; and,
8. Minimum 1.5 m thick non-potentially acid generating Type 1 mine rockfill pad.

The rockfill pad will include perimeter berms to 1 m height. The pad liner system will run up the perimeter berms and will be anchored in a trench at the berm crest to provide control for runoff. More

detailed information regarding pads is included in Technical Appendix 2D (Conceptual Design for Ore and Special Waste Pads and Ponds)

Sissons Site

It is proposed to manage Type 3 mine rock from the Andrew Lake pit during operation in a temporary surface stockpile with drainage collection and treatment. This material will then be placed at the bottom of the Andrew Lake pit during the decommissioning phase. The design concept for the Sissons temporary stockpile will be similar to that of the Kiggavik temporary stockpiles. The planned footprint of the temporary stockpile at Sissons is approximately 13 ha.

8.2.2 Stability Analysis

Stability analyses were performed using the limit equilibrium slope stability program SLOPE/W (Geoslope, 2010), applying the Morgenstern-Price Method to compute factors of safety for selected failure surface. The critical section for stability examined was the Type 3 mine rock temporary pile and its sedimentation pond with a conservative maximum design height of 40 m. Material properties used in the analysis are presented in Figure 8.2-1.

Materials are expected to be frozen, but thawed parameters were used for analyses. Generally, freezing of materials will add strength and increase factors of safety for stability. Static and seismic loadings conditions were examined. Pseudo-static analyses considered the 1/1000 year return period event including a peak ground acceleration (PGA) of 0.035 g (2005 National Building Code Seismic Hazard Calculation). One-half of the PGA, or 0.02 g was applied in stability analyses as the horizontal seismic coefficient.

A friction angle of the liner system of 17 degrees was assumed based on experience and testing for soil – liner interactions at other projects in the north. However laboratory testing of liner system friction is recommended for future design stages.

The results of stability analysis can be summarized as follows:

- Static conditions
    - Design criteria/Minimum Factor of Safety 1.0
    - Calculated Factor of Safety 1.3
- Pseudo-static conditions
    - Design criteria/Minimum Factor of Safety 1.0
    - Calculated Factor of Safety 1.2

The analysis shows that the calculated factors of safety meet or exceed the minimum design criteria values (see also Technical Appendix 2D ("Conceptual Design for Ore and Special Waste Pads and Ponds").

8.3 Permanent Stockpiles

8.3.1 Design

Kiggavik Site

Mine rock not utilized for construction and deemed acceptable from the perspective of acid rock drainage and metal leaching will be permanently stockpiled at the Kiggavik site. It is proposed to construct two stockpiles to accommodate the Type 2 material excavated from the Kiggavik pits.

Approximately 22 million m3 (unbroken) of Type 2 mine rock material will be generated. The cumulative volume of the two stockpiles is estimated to be on the order of 29 million m3, based on a swelling factor of 1.3. Excavated mine rock will be loaded on trucks and hauled to the stockpile.

Stockpile North will be located to the north of the Kiggavik pits (Figures 8.3-1). The planned footprint of stockpile North is approximately 52 ha. Stockpile South will be located to the south of the pits. The planned footprint of stockpile South is approximately 77 ha. Both stockpiles will be surrounded by perimeter ditches designed to collect runoff water from the stockpiles. Drainage water from the Kiggavik stockpiles will largely consist of direct precipitation (i.e., rainfall and snowfall), with minor amounts of blowing snow and surrounding catchment runoff, impinging the pile perimeter. Berms will be constructed along the outer edge of each ditch. These berms will prevent surface runoff from surrounding undeveloped areas from flowing into the perimeter ditch and mixing with runoff water from the stockpiles.

The stockpiles will be constructed in order to meet appropriate physical stability criteria. A layered approach to stockpile construction is proposed to increase the overall stockpile stability. The layered placement creates a high uniform density while minimizing segregation to create a stockpile with minimal permeability to air and water penetration. The method also reduces settlement and therefore further enhances overall stockpile stability. It is expected that the stockpiles will be 30 m to 40 m high and constructed in approximately 10 m lifts with catchments remaining at the completion of each lift. An angle of repose of 37° and an overall dump slope of 26.5° are considered at this stage. The catchments will also act as a slope break and minimize erosion caused by surface runoff.

Sissons Site

At Andrew Lake it is proposed to manage the Type 2 mine rock in one stockpile (Figure 8.3-2). This stockpile is designed in a manner similar to that of the Kiggavik stockpiles. Based on the open pit mine plan, the volume of the Sissons mine rock stockpile is estimated to be on the order 35 million m^3, based on a swelling factor of 1.3. Excavated mine rock will be loaded on trucks and hauled to the waste rock pile(s).

It is proposed to stockpile End Grid mine rock from the ramp extraction with the Andrew Lake mine rock. Some mine rock from End Grid will be stockpiled separately and crushed to be used in mine backfill. The planned footprint of the permanent stockpile at Sissons is approximately 132 ha

8.3.2 Thermal Conditions

Thermal modeling was carried out using the finite element model SVHEAT (SoilVision Systems, 2009) to simulate thermal conditions during the construction of the permanent piles as well as long term conditions. The objective of the modeling assessment was to evaluate the rate of permafrost development within the pile given different construction scenarios. This was achieved by varying the lift thickness, the sequence and season of deposition. The piles were modeled by placing two or five lifts with thickness of 5, 10 or 25 m. The lifts were placed at intervals of 6, 12 or 18 months; seasonal deposition varied between summer deposition (warmest) and winter deposition (coldest). Additional information regarding the thermal modeling is included in the Technical Appendix 5G (Thermal and Water Transport Modeling for the Waste Rock Piles and TMF).

Three material types were used in the simulations, namely coarse waste rock, waste rock subject to traffic, and bedrock. The thermal properties used in the simulations are summarized in Table 8.3-1. The properties of the bedrock are based on the values presented in the Technical Appendix 5B (Geology and Hydrogeology Baseline). The properties of the waste rock material were deducted from the properties of the bedrock as a granular material and on the observations reported by Neuner et al. (2009). Traffic zone waste rock has higher water content as a result of the higher fraction of fines.

Table 8.3-1 Thermal Properties of Mine Rock and Bedrock

Material	Thermal conductivity [kJ/(day m C)]		Volumetric heat capacity [kJ/(m^3 C)]		Porosity	Volumetric water content
	Unfrozen	Frozen	Unfrozen	Frozen		
Waste rock traffic	135	161	2099	1722	0.30	0.18
Waste rock	71	74	1597	1471	0.30	0.06
Bedrock	271.9	275.5	2314	2293	0.01	0.01

Two climate scenarios were considered; a current climatic condition scenario and a climate change scenario. The climate change scenario was simulated by introducing a warming trend of 5°C over a 100 year period (see Technical Appendix 4D “Baker Lake Long Term Climate Scenario”).

The results of the thermal modelling indicate that:

- Permafrost would eventually develop in the permanent stockpiles under the current climate conditions;
- Undisturbed ground surfaces (natural ground) will likely retain permafrost after a warming of 5°C;
- Permafrost could become marginal or disappear at the base of the permanent pile when certain surface conditions are considered and when the 5°C warming from climate change is considered;
- Winter deposition of mine rock in the pile will promote development of frozen conditions, while summer deposition will delay it. The time difference could be in the order of several decades before reaching similar thermal conditions;
- Frozen conditions could be promoted by depositing alternating lifts of mine rock in the summer and winter; and
- Traffic zones have negligible effects on the thermal regime, but their presence will promote the development of water barriers once frozen, thus restricting percolation through the pile.

8.3.3 Water Balance

Climatic Parameters

The mean climatic parameters and upper and lower ranges suggested for the Kiggavik Project area are presented in Table 8.3-2. These parameters have been estimated by Golder Associates Ltd. (Golder) using a number of sources and methods. The ranges indicated in Table 8.3-2 serve to address the upper and lower boundary that may occur depending on climatic conditions. Depending on the application, a higher or lower value may be used to bring a degree of conservatism to a particular assessment or for a design basis.

Table 8.3-2 Suggested Climatic Parameters to be used for Water Balance Calculations at Kiggavik

Parameter (mm/year)	Mean	Lower Value	Upper Value
Rainfall	169.8	121.9	217.7
Snowfall	174.8	118.1	231.4
Evaporation	182.8	127.9	253.9
Evapotranspiration	122.5	85.7	170.1
Sublimation	48.9	33.1	64.8
Blowing Snow	31.5	21.3	41.7

Snow Distribution

A summary of recent studies characterizing the hydrology of waste rock piles at mines sites located in cold climates (Diavik, Ekati, Red Dog and Svea) is included in the Technical Appendix 5I (Hydrology of Waste Rock Piles in Cold Climates). This summary provides a background for predictions of infiltration from the proposed permanent piles at the Kiggavik and Sissons sites. It also suggests that wind plays a large role in the redistribution of the snow at the top and slopes of the piles.

Quantitative results from a comprehensive research program at Diavik have indicated, based on results from 2006 and 2007, that snow depth prior to melt had been from 0 cm to 5 cm at top of pile while the piles slopes were accumulating approximately 150 cm (Neuner 2009). This study does not highlight differences between the windward and leeward slopes of the piles. Taking into account that

the annual snowfall in millimetres of snow water equivalent at Diavik is approximately 187 mm, these results are an indication that the snowfall at the top of the piles is transported downwind likely to the leeward slope of the pile while the windward slope trap snow until a drift in equilibrium is formed. Similarly, the leeward slope will also trap snow until a drift in equilibrium is formed.

Climate variables at Diavik are comparable with climate variables at Baker Lake (Table 8.3-3). Consequently the findings from the hydrology studies at Diavik are reasonably representative for the Project, i.e., it will be expected that future mine rock piles at the Kiggavik Project will have large proportion of snow transported from the top to the leeward slopes of the piles, but there will not likely be large differences between the snow deposited in the windward and leeward slopes. The explanation of this could be the topographic characteristic surrounding the piles, which is basically a flat, tundra non-vegetated land surface where the only major topography feature is the pile. It means that most of the blowing snow from the land on the site of the windward slope will deposit on that slope forming a drift that eventually will reach equilibrium while the snow from the top will be transported to the leeward side and farther where the drift formed on that slope reaches equilibrium. The fetch for the blowing snow at the top is the average width of the pile top perpendicular to the dominant wind direction.

Table 8.3-3 Relevant Climate variables for Diavik and Baker Lake

Parameter	Baker Lake	Diavik
Temperature (^{o}C)	- 12 (1946 – 2008)	- 11 (1959 – 2006)
Rainfall (mm)	169	184
Snowfall water equivalent (mm)	175	177

An estimate of the amount of snow remaining on the permanent mine rock pile surface prior to the spring snowmelt period is included in the Technical Appendix 5H (Waste Rock Water Balance). In this assessment the height of the piles was assumed to be 50 m and the length of the pile is assumed to be 34 times the height or larger. Results of the estimate can be summarized as follows:

The expected amount of snow on the top of the permanent mine rock piles prior to the snowmelt at the Project site, which typically occurs in late May or early June will be close to zero for average winters, zero for dry winters and less than 5 mm for wet winters.

The expected amount of snow on the slope of the mine rock piles before snowmelt at the end of May will be less than 307 mm for average winters, less than 257 mm for dry winters and less than 401

mm for wet winters. If these amounts exceed the maximum equilibrium volume, the amount trapped will be the maximum volume.

Net Percolation

The water balance of the permanent stockpiles was assessed using a water transport model that incorporated the climatic conditions at the Kiggavik site. The objective was to estimate the net percolation through the entire profile. The simulations were applied to uncovered and covered mine rock profiles. The soil water modelling was performed using Hydrus-1D software (Simunek et al., 2009)

The geometry that was modelled consisted of a 25 m thick vertical profile that included 0.5 m zones to represent traffic zones. This profile was to represent a pile constructed in five lifts of 5m each, with the top 0.5 m of each lift being composed of finer material to represent traffic zones. A soil cover was incorporated in some of the simulations, and consisted of adjusting the hydraulic properties of the top traffic zones to represent the cover material.

Three material types were used in the simulations: coarse mine rock, fine mine rock and silty clay. The silty clay was used in some simulations to represent the inclusion of a soil cover over the stockpile.

The properties of the waste rock material (fine and coarse) are based on the values presented in Neuner et al. (2009) for the Diavik Mine. The hydraulic properties of the silty clay were selected from Hydrus-1D (Simunek et al. 2009). The hydraulic properties were modelled according to the van Genuchten-Mualem model with the air entry value limited to 0.02 m of suction. The parameters used to define the hydraulic properties of the materials are listed in Table 8.3-4 (the parameters α and η are for the soil water retention function while l is the tortuosity parameter in the hydraulic conductivity function).

Table 8.3-4 Hydraulic Properties used in the Infiltration Model

	Volumetric water content		Saturated hydraulic conductivity	α	η	l
	Residual	Saturated	(m/s)	(1/m)		
Fine waste rock	0.01	0.25	9.0E-06	5.9	1.45	0.5
Coarse waste rock	0.01	0.25	1.0E-02	1.6	4.00	0.5
Silty clay	0.07	0.36	5.6E-08	0.5	1.09	0.5

More detailed information regarding the infiltration model is included in Technical Appendix 5G (Thermal and Water Transport Modeling for the Waste Rock Piles and TMF).

The results of the water transport modelling indicate that:

- Net percolation through mine rock material will likely be in the order of 30 to 50 percent of the annual total precipitation under unfrozen conditions. For frozen permanent mine rock piles, the percolating water will also freeze and eventually block the flow paths. The bulk of the mine rock material would consequently be isolated from percolating water and restrict the transport of contaminants that could be present in the mine rock material. The percolation values mentioned above would eventually be limited to the freeze-thaw zone near the surface (active zone).
- Fine grained soil covers have the potential of reducing the net percolation to less than 5 percent of the annual total precipitation;
- The traffic zones (finer particles) will retain more water, thus acting as barriers to water transport once the pile is frozen. The zones could encapsulate and maintain large dry zones within the pile that would be deprived from percolating water. It could also act as a barrier to oxygen transport and consequently limit the oxidation of the mine rock material; and
- The water storage of the permanent mine rock pile profile could take years to stabilize as the mine rock material will be deficient in pore water when placed in the pile.

8.3.4 Frost-Heave

In general frost-heave needs freeze/thaw cycles plus a source of water. The freeze/thaw cycle will always be present unless climate change becomes extreme; resulting in either the climate remains above or below 0 C. The potential issue is therefore to control/manage water. Water will eventually freeze in the waste rock dump and induce some deformation at the time of freezing. The frozen pore water will remain frozen unless it is located within the active zone. One strategy is to eliminate or at least minimise the presence of fines in the material that will be located in the active zone. This would provide good drainage capabilities, minimise water retention and consequently reduce the source for water for frost-heave. The lack of fines in the active zone would also eliminate the risk of transporting additional pore water by capillarity during the freezing process. It is a common cause for excessive frost-heave. A good example of frost-heave by capillarity is the formation of pingos. They are essentially “ice mountains”. Finally, it is important that the excess pore water that is mobile in the active zone can drain to zones that are not frost-heave susceptible.

It is understood that the potential concern related to frost-heave in the context of waste rock management may be related to solifluction and particle displacement by frost jacking. Solifluction may occur along slopes in two steps: frost-heave followied by thawing. Frost-heave may occur along

a vector that is normal (90°) to the slope of the ground surface. The subsequent thawing would induce a deformation that would be controlled by gravity, thus a downward vertical vector. The net movement would be a vector that is tangent to the slope of the ground surface. Solifluction requires frost-heave susceptible soils, thus poorly draining soils. Particle displacement by frost jacking is also caused by the combination of freeze and thaw. The freezing of the pore water first pushes the particle in a direction that is normal to the freeze front. Frost-heave process can also induce large stress loads in the same direction. The thawing of the displaced particle will follow a downward vertical vector, will not benefit from the load stresses induced by the frost-heave process and will be subject to particle interlocking that will restrict particle free movement. Excess pore water in the active zone would be again the main vehicle for frost-heave deformations.

In the case of waste rock piles, they are ultimately designed to control surface runoff, prevent excessive water accumulation in the pile (i.e. constant source of water) and can be processed to provide well-drainage material within the active zone. The stability of the slope should not be threatened if the piles are designed to minimise frost-heave deformation, and that the excess pore water escaping the dumps is properly managed.

9 Potential Post-Decommissioning Effects

9.1 Construction Material – Type 1 Mine Rock

Based on the segregation criteria for the mine rock material that has been predicted to be produced during mining operation, the Type 1 mine rock material was assessed for its use as construction material. The characterization of the Type 1 mine rock material presented in Section 5.0 provided an initial understanding of the static and kinetic properties of the material. Further evaluation of the mine rock characterization, and calculations with results from the various kinetic tests, has provided a guideline for the Type 1 material's use for construction purposes.

The field loading rates for the Type 1 material (Table 7.2-1) were used to calculate an estimated constituent concentration that would be produced from the Type 1 material that may be used in construction at either the Kiggavik or Andrew Lake sites. The constituent concentrations were conservatively estimated based on a unit area and mass of mine rock material that could be used in construction in accordance with the annual water balance. The amount of mine rock material that could safely be used in any type of site construction was determined to insure CCME guidelines for the protection of freshwater aquatic life would not be exceeded.

9.1.1 Kiggavik Type 1 Mine Rock

The summary of the estimated constituent concentrations that would originate from the Type 1 Kiggavik mine rock material used in construction according to mass are shown in Table 9.1-1. Using the water balance values provided in Table 8.3-3 and assuming a total infiltration of 80%, the net inflow of water into the rock pile was calculated to be 0.275 m^3/yr based on a unit surface area. Therefore, only an estimated 225 kg of Type 1 Kiggavik material could be used per square meter in order to stay within the CCME guidelines for all COPCs. However, due to the conservatism incorporated into the field loading rates due to detection limit sensitivity, as well as pH controls on the some of the actual COPC concentrations, a greater amount of Type 1 material could potentially be used for construction. When considering the pH dependency of Al and Cu, as well as screening index associated with Cd, Ni, Pb, Sb, Se, V, and Zn, a more realistic amount of material that could be used in construction would be 1,800 kg of material per square meter, above which the predicted dissolved U-concentration begins to exceed CCME guidelines. It is considered that this estimate is still conservative because unfrozen conditions are assumed. In reality the rock is frozen during several months of the year and no dissolution occurs.

9.1.2 Andrew Lake Type 1 Mine Rock

The summary of the estimated constituent concentrations that would originate from the Type 1 Andrew Lake mine rock material used in construction based on mass are shown in Table 9.1-1. Similar to results for the Kiggavik Type 1 rock material, an estimated 60 kg of material could be used per square meter in order to stay within the CCME guidelines for all COPCs. However, accounting for conservatism in the results, up to 525 kg of material per square meter could potentially be used for construction purposes and remain below CCME guidelines, after which predicted Cu concentrations exceed CCME guidelines assuming a pH of about 7. Additionally, if the loading rates for the COPCs that are influenced by detection limit issues are considered to be no more than ten times conservative, as for Cd, then 3,600 kg of material could be used for construction purposes before U concentration begin to exceed CCME guidelines.

9.2 Permanently Stockpiled Type 2 Mine Rock

The influence on the site's water quality was assessed for the Type 2 mine rock material that will be permanently stored during operation and at closure at both the Kiggavik and Andrew Lake site. The field loading rates calculated and discussed previously in Section 7 were used to make estimates of the quality of water that will discharge from Pointer and Andrew Lakes. The discharge concentrations were conservatively calculated from the expected loadings from the rock piles and the annual average discharge rates from the lakes that were considered to be the first receiving water body at each site. The loadings were calculated from the volumes of mine rock to be produced (Table 8.1-1) with an assumed bulk density of 1500 kg/m^3. The mean annual discharges for Pointer Lake and Andrew Lake were estimated to be 15.9 and 6.63 Mm^3/a,, respectively (see Technical Appendix 6A "Hydrology Baseline"). The resulting concentrations were then conservatively calculated as the loading rate divided by the flow rate as a simple mixing process with no chemical attenuation for any constituents.

For example, the field loading rate for sulphate from the Kiggavik stockpile is 0.011 mg-SO_4/kg-rock/wk or 0.57 mg /kg/year. Therefore, based on an estimated mass of rock in the stockpile of 54.9 Mt (36.6 Mm^3 x 1500 kg/m^3), the annual mass loading to Pointer Lake would be 31,500 kg/a. Using a mean annual discharge of 15.9 Mm^3/a, the average annual concentration of sulphate at the Pointer Lake discharge is about 1.98 mg/L. The predicted discharge concentrations for all COPCs are presented in Table 9.2-1 and are compared to CCME Canadian water quality guidelines for the protection of freshwater aquatic life.

There are a number of conservative assumptions incorporated into these calculations, such that these values likely represent maximum concentrations, and under actual field conditions many COPC concentrations will likely be much lower due to natural pH control (and solubility limitations) for some analytes, and natural attenuation or chemical reactions that have not been accounted for in the calculations. In addition, the calculations assume that all drainage from the stockpile would

report directly to either Pointer or Andrew Lakes, and do not account for attenuation or dilution. The stockpiles were also assumed to fully contribute to the loadings and to not contain a frozen core.

Based on these assumptions the predicted concentrations for Pointer Lake, which will receive drainage from the Kiggavik rock stockpile, exceed the CCME guidelines for Al while the predicted concentrations for Andrew Lake, which will receive drainage from the Andrew Lake rock stockpile, exceed the guideline values for Al, Cd, Cu, Se, and Zn based on mass balance and mixing predictions (Table 9.2-1).

The aluminum concentration estimated for Pointer Lake is based only on mass balance for aluminum release from the clean rock. Under neutral pH conditions, aluminum will be controlled to low concentrations in the pore water of the rock and the predicted concentration in Pointer Lake is therefore greatly exaggerated over the more realistic value that will occur in the field. Also, concentrations of Cd, Cu, Se and Zn, that are predicted to exceed CCME values in Andrew Lake are based on detection limit values from the humidity cell results and therefore are biased high and are likely to be lower in the field than the values predicted in Table 9.2-1. Therefore, at a screening level, the loadings from the clean rock piles are considered to remain protective of downstream water quality at the Kiggavik and Sissons sites for the long term.

9.3 Type 3 Rock Material

As part of the mine rock characterization, management, and effects assessment for the Type 3 Kiggavik and Andrew Lake mine rock material, the long-term effects on the sites water quality were evaluated from laboratory and field tests. It has been proposed that the Type 3 material will be temporarily stored on lined pads during operation and all drainage from the rock will be collected and treated as required. At closure, the rock will be relocated to the open pits, where it will be submerged by water as the pits flood. The rock will be permanently stored underwater in the respective mined out pits at each of the two primary sites, namely Kiggavik and Andrew Lake. However, the in-pit disposal at closure of the mine materials produced during operation will be partitioned differently and contain different materials at each of the two primary sites. At the Kiggavik site, there are a few different proposals to manage both the tailings and Type 3 mine rock material. Although a few different management strategies have been proposed, they all essentially consist of an initial deposition of tailings followed by the deposition of the Type 3 mine rock, which would then be overlain by a portion of the Type 2 mine rock with a final layer of till cover. Whereas, at the Andrew Lake site, only the Type 3 mine rock material will be first placed in the open pit followed by a thin layer (~4 m) of Type 2 mine rock, which would finally be covered with a thin layer of till (~1 m). Once all of the solid materials are place in the Andrew Lake pit, the pit will fill under accelerated conditions to submerge the placed materials.

The results from the humidity cell tests on the Type 3 waste rock material provided a basis to calculate the initial soluble load to the pore water in the flooded rock in the Kiggavik pit and to the pit

water in the Andrew Lake pit. The pore water concentrations originating from the temporarily stored material were calculated using the field loading rates and by estimating the sizes of the temporary stockpiles.

Other sources of loadings to the Andrew Lake pit water include the rubble left on benches and the walls of the mine out pit. A thorough analysis and assessment of the immediate and long-term influences on the water quality of the Andrew Lake pit are discussed in Section 10 below.

Temporary Rock Piles - Pore Water Concentrations

The pore water concentrations expected to be produced in the temporarily stored Type 3 mine rock material were calculated using the field loading rates, an estimate of the mine rock piles dimensions, and the expected annual water balance. The expected loose volume and surface areas of Type 3 mine rock are about 2.0 Mm^3 and 15.1ha for the Kiggavik temporary mine rock storage pile and 1.52Mm^3 and 14.2Mm^2 for the Andrew Lake stock pile. Based on the expected loose volume and surface area available for storage it was calculated that the final height of the piles would be about 13 and 11m for the Kiggavik and Andrew Lake piles, respectively. Using a net inflow of water into the rock pile of 0.275 m^3/yr based on a unit surface area and assumed density of 1500 kg/m^3, the pore water concentrations in the rock piles were calculated and are summarized in Table 9.3-1.

Table 9.3-1 Summary of Calculated Pore Water Concentrations for Kiggavik Rock and Andrew Lake Rock Type 3 Material

	Main Zone Waste Rock Material		Andrew Lake Waste Rock Material	
COPC	Field Adjusted Loading Rates (mg/kg/wk)	Pore Water Concentration (mg/L)	Field Adjusted Loading Rates (mg/kg/wk)	Pore Water Concentration (mg/L)
Sulphate (SO_4^{2-})	0.011	160	0.063	896
Aluminum (Al)	0.00022	3.11	0.00115	16.3
Arsenic (As)	1.52E-06	0.022	5.73E-06	0.081
Cadmium (Cd)	1.03E-07	0.0015	2.91E-07	0.0041
Chromium (Cr)	9.19E-07	0.013	4.36E-06	0.062
Cobalt (Co)	4.00E-06	0.057	3.04E-06	0.043
Copper (Cu)	5.57E-06	0.079	1.53E-05	0.22
Manganese (Mn)	2.73E-05	0.39	2.60E-05	0.37
Molybdenum (Mo)	0.00015	2.06	4.80E-06	0.068
Nickel (Ni)	5.57E-06	0.079	1.53E-05	0.22
Lead (Pb)	7.99E-07	0.011	2.04E-06	0.029
Antimony (Sb)	7.28E-07	0.01	2.91E-06	0.041
Selenium (Se)	1.48E-06	0.021	2.91E-06	0.041
Strontium (Sr)	0.00015	2.16	0.00022	3.1
Uranium (U)	0.00019	2.64	1.05E-04	1.49
Vanadium (V)	8.68E-06	0.12	2.91E-05	0.41
Zinc (Zn)	2.21E-05	0.31	9.63E-05	1.37

Runoff and water percolating through the temporary stockpile will be collected using ditches and a holding pond underlain by liners, such that the water can be recycled for use in the mill and/or treated before release.

In-pit Disposal of Type 3 Material

After the Type 3 mine rock material is placed in the mined out pits, it will continue to contribute loads as the pit fillsunder accelerated conditions and after it is submerged. Although leaching behavior of mine rock is greatly reduced once materials become submerged and thus placed in a relatively anoxic environment, the materials can continue to contribute small loadings. Underwater leaching tests were established to assess what loads could be expected from the submerged Type 3 mine rock material.

At closure, the Type 3 material will be relocated to the mined-out open pits, where it will be submerged by water as the pits flood. Although a few different management strategies have been proposed for the Kiggavik site, all options essentially consist of an initial deposition of tailings followed by the deposition of the Type 3 mine rock, which would then be overlain by a portion of the Type 2 or clean mine rock with a final layer of till cover.

A laboratory assessment was completed to assess the water quality of this layered system. The results of that assessment showed that with the exception of uranium, no COPCs in the water leaving the pit will exceed CCME guideline values for the protection of aquatic life (Attachment F). The conservative assessment suggested that uranium may marginally exceed the CCME guideline if no additional mitigation is applied. This scenario will be reassessed during licensing and if the predicted uranium exceedance is confirmed, a test program will be teveloped to determine the design criteria for effective mitigation of uranium concentrations to prevent exceedences in the water leaving the pit.

At the Andrew Lake site, backfilling of the pit will consist of the Type 3 mine rock material with a thin layer of Type 2 mine rock, which would finally be covered with a thin layer of till (~1 m). No tailings deposition is planned for the Andrew Lake pit. Once all of the solid materials are backfilled, the pit will fill under accelerated conditions to submerge the relocated materials. An assessment of post-closure water quality in the Andrew Lake pit that incorporates the relocation of Type 3 rock to the pit is provided in Section 10 below.

10 Andrew Lake Pit Water Quality

The Andrew Lake open pit will have a volume of approximately 40 Mm^3 after mining is completed and will fill with water over time to become a water filled pit. The pit will be used for permanent storage of Type 3 Andrew Lake rock material after closure that has been temporarily stored near the pit during operation. The water quality in the water-filled pit was assessed to determine conditions after flooding is complete and before discharge from the pit will occur. There are two possible scenarios for flooding after closure. One scenario is to allow flooding that will occur naturally as a result of the accumulation of rain and snow melt and the small amount of seepage that may be expected to occur in the active layer near ground surface. At the expected natural filling rate, complete flooding will require approximately 480 years.

Alternatively, the natural filling of the pit can be complemented by flow from local spring runoff or from a larger water body, such as Andrew Lake, during periods of high flow in order to shorten the flooding period. Experience has shown that while leaching of metals and other COPCs can occur while rock, including pit walls, is exposed to the atmosphere and natural weathering processes, such leaching tends to be insignificant to non-measurable when the same rock is submerged below water. This difference in behaviour suggests that rapid flooding may have some advantages for maintaining good water quality at some sites. However, water quality will depend on site-specific conditions, including expected leaching rates for pit rock. Therefore, the water quality in the flooded Andrew Lake pit was evaluated at a conservative screening level in order to determine whether or not natural filling would result in acceptable water quality after flooding was complete.

There are several potential sources of loadings of COPCs to the pit water after closure while the pit is filling with water and after filling is complete and flow out of the pit occurs. The Type 3 rock that will be stored temporarily on a pad near the pit will be exposed to weathering during the mining operation and loadings will result in pore water or moisture in the rock to have elevated concentrations. When this rock is relocated to the pit at the end of mining, the COPCs in the pore water with the rock will mix with the flooding water as it fills the pore spaces in the rock. Although not all of the dissolved mass in the pore water will be released to the water above the flooded rock, it can be conservatively assumed that all of the mass will mix in the pit water for this screening assessment. After the rock is relocated to the pit, it will require about 6 years to completely flood the pit. During the flooding period, the rock that is above water will continue to leach and to be a source of loadings to the pore water within the rock. The contribution of COPCs can be estimated with the loading rates and exposure time before complete flooding. An important potential source of loadings to the pit water while filling is occurring is the leaching of the rock material that occurs as rubble on the pit floor and that remaining on the benches after mining is complete. The rubble will be exposed to weathering before it is submerged in water. The loadings for the unflooded rubble can be estimated. The final potential source of loadings to the pit water is the leaching from the pit walls that are above the rising water level. The walls are exposed and subject to leaching while above water

and the loadings report to the pit water. All of these potential contributors to mass loadings to the pit water were quantified in order to estimate the concentrations of COPCs in the flooded pit at approximately 500 years post closure.

At a screening level, the mass loadings to the pit water were calculated for potential contributions of COPCs from the rubble on the pit floor, the pit wall loadings during flooding, pore water from the temporarily stored material that will be relocated to the pit, and the short-term leaching of the re-placed Type 3 material during flooding. The total loads for each COPC was then assumed to be fully mixed in the pit water to estimate the incremental concentrations from the rock and pit wall sources when filled.

After filling, the natural input of water to the pit will continue until overflow or to a level controlled by an outlet or structure. The only rock that can contribute important loadings to the natural inflow will be the pit walls remaining above the final water level. The resulting concentrations in the pit water were calculated for steady-state conditions by estimating the annual loadings from the pit walls mixed with the annual outflow volume. At a screening level, this provides a limit on the long term concentrations that may develop in the pit water.

10.1 Methods

The prediction of water quality was based on mass balance principles and mixing with no consideration of geochemical reactions and therefore is highly conservative in nature. The leaching rates for COPCs were based on the results from humidity cell testing on Andrew Lake rock that are summarized in Tables 10.1-1, 10.1-2 and 10.1-3. The leaching or loading rates for the rubble and wall material are shown in Table 10.1-3. The loading rates used for the Type 3 material that will be temporarily stored on a lined pad and the pore water concentrations that will develop in the rock before it is relocated to the pit are shown in Table 10.1-1 and Table 10.1-2, respectively. All loading rates used in the Andrew Lake pit water quality predictions have conservative adjustments for temperature and grain size. Additionally, the loading rates used in the calculated loading contributions from the rubble material and the pit walls were those of the Type 3 material in order to remain conservative in the assessment, as it is assumed that the rubble and walls will have compositions and chemical properties similar to all three types of rock material that will be excavated from the pit.

Leaching of the rock in the pit was assumed to occur while materials were exposed to the atmosphere prior to submergence. After flooding, the leaching rate of the rock was assumed to be zero. The flooding rate of the pit and the stage curve for volume as a function of elevation were used to calculate the area of the pit that was exposed as a function of time. Figure 10.1-1 shows the pit volume as a function of elevation. The natural filling rate was then used to calculate the water elevation as a function of time that is shown graphically in Figure 10.1-2 . The unflooded area of the

pit floor was calculated as a function of filling time and the results are presented graphically in Figure 10.1-3.

The cumulative loads for COPCs were calculated for the pit filling period. While the deepest areas of the pit floor will be exposed for a relatively short period of a few tens of years, the topmost bench will be exposed for the approximate 500 year filling period. Therefore, the four components, including walls, rubble, pore water, and relocated Type 3 material, that contributed to constituent loadings, either at the beginning or during pit filling, were summed to get the total constituent load once the pit has filled. At the end of the pit flooding, it was assumed that the cumulative loads of COPCs were mixed with 43 Mm^3 of pit water and the resulting concentrations were calculated. The value of 43 Mm^3 of water represents a conservative volume of water that could be in the pit with 15 m of exposed pit walls above the final water level. In addition to the COPCs that may affect water quality, hardness was also predicted from the results of calcium and magnesium leaching rates in humidity cell tests and the correlation with sulphate (Hardness in mg-$CaCO_3$/L = Sulphate (mg/L) x 3.7 – 7.6; R^2=0.91).

After filling, it was assumed that water will flow out of the pit as a result of net natural inflow from precipitation and runoff to the pit. The annual flow rate through the pit was estimated to be about 89,500 m^3/a. The total loads of COPCs to the pit from the exposed walls once the pit has completely filled with water were then mixed with the annual flow to estimate steady-state concentrations in the outflow water.

The pH of the pit water will likely be influenced by the leaching behavior of the relocated Type 3 rock as well as leaching of the rubble and pit walls. The results from the humidity cell tests were used to estimate the pH of the water influenced by leaching of the rock. However, the water in the pit will also be influenced by the chemistry of the inflow water that will consist of surface water and runoff as well as groundwater. The effects on pit water pH are discussed below.

The concentration of chloride in the pit water was considered as a special case. No source of chloride is expected to originate from any components of leaching of the mine rock or from the pit walls and therefore there will be no contribution of chloride to the pit water directly from mining activities. However, elevated chloride concentrations exist in the groundwater below the frozen permafrost layer. Some of the unfrozen groundwater is expected to enter the pit after mining when the pit is filling. Therefore, the contribution of groundwater to the pit was considered in the estimate of chloride in pit water.

The contribution of groundwater to a filling pit in low-permeability igneous and metamorphic rock such as that at the Kiggavik site is typically much less that 10% of the total inflow to the pit that is expected to be dominated by rainfall, local runoff and snow-melt. Therefore, for natural filling of the pit, it was conservatively assumed that the total water volume will consist of 10% groundwater and 90% surface runoff and snow-melt. If the pit filling is enhanced to fill the pit in 10 years using surface

water, then groundwater will be a much smaller percentage of the total pit volume equivalent to 10/400 times 10% or 0.25% of the total water volume in the pit when filled. It was therefore conservatively assumed that the percentage of groundwater was 0.25% of the total for accelerated filling of the pit. After filling it is highly unlikely that groundwater inflow to the pit will exceed 1% of the total inflow and therefore, it was assumed that groundwater will represent 1% of the water inflow over the long term. The quality of the groundwater is presented in Vol. 5B Chapter 6 "Groundwater Quality", Tables 6.2-1 to 6.2-3. The chloride concentrations in the groundwater samples ranged from about 1,200 to 1,700 mg/L. The higher chloride concentration of 1,700 mg/L was used in this assessment.

The calculated concentrations in the pit water immediately after flooding and at steady-state were then compared to guideline values for the protection of aquatic life to determine if the estimated water quality is acceptable for release to the environment.

10.2 Results

The calculated well-mixed concentrations of COPCs after approximately 480 years of pit filling are summarized in Table 10.2-2. The calculated concentrations are compared to guideline values for the protection of freshwater aquatic life (CCME, 2007). The results show that the pit water will have concentrations that are less than the guideline values at the end of natural pit filling with the exception of aluminum (0.069 mg/L), cadmium (0.000017 mg/L) and chloride (170 mg/L) concentrations. The calculated value for aluminum is very conservative and is based on mass balance and mixing only. In reality, aluminum concentrations are pH sensitive and the final aluminum values will likely be much lower than the calculated one at neutral pH expected in the pit. The calculated concentration for cadmium was biased on the high side by using the detection limit values for concentrations in the humidity cell leachate samples. The cadmium concentrations in the leachate were consistently less than the detection limit and therefore the calculated concentration in the pit represents a maximum value and the actual value is likely to be much less. The predicted chloride concentration marginally exceeds the guideline value of 120 mg/L for the very conservative assumption that groundwater contributes 10% of the water volume to the pit when filled.

The pH in the filled pit is expected to be in the range of 5 to 7 with the lower value marginally lower that the guideline range. The pH of the leachate from the humidity cells was in the range of 4.5 to 6.5. Although this pH range would be considered as mildly acidic, the acidity (as mg-$CaCO_3$/L) will be very low and therefore the pH can be easily influenced by the pH of the inflow waters. The pH of the surface waters in the area are in the range of 6.5 to 7.5 with low alkalinity concentrations and the groundwater has pH values in the range 6 to 7.7 with moderately high alkalinity concentrations. Therefore, it is likely that the final pH of the water in the filled pit will be in the range of 6 to 7. Contingency measures are available for pH adjustment after pit filling are readily available and practical, if required.

The pit water quality may also be improved with accelerated pit filling. The enhanced pit filling would produce water quality better than that for the natural filling scenario because more rapid filling would result in shorter exposure times for the same rock mass or surface area creating less cumulative loadings of COPCs that will mix with the same total volume of water. The mass loads originating from the four loadings sources are shown in Table 10.2-1 under three different filling conditions. The filling rate of 89,553 m^3/a is representative of the natural filling rate, whereas the filling rates of 428,000 m^3/a and 4,280,000 m^3/a are representative of accelerated fill rates to achieve complete pit filling in 100 and 10 years, respectively. Figure 10.2-1 shows the resulting Andrew Lake pit water concentrations for sulphate and uranium under the three pit filling scenarios. Therefore, if natural long-term filling results produce unacceptable water quality for only two constituents, more rapid filling can produce acceptable water quality. No predicted concentrations of COPCs exceed guideline values for the 10 year filling scenario.

From a Project management perspective, the outcome of flooding the pit needs to be known before the end of the physical decommissioning period. Acceptable surface water quality in the flooded pit is a prerequisite to removing the dewatering berm in Andrew Lake and thus restoring the lake to its original state. The Preliminary Decommissioning (PDP; Tier 3, Technical Appendix 2R) is based on flooding the pit over six years. The analysis of water quality for an accelerated time of ten years thus provides a reasonable but conservative estimate of water quality for the PDP.

The results for long term steady-state concentrations in the pit water from the exposed pit walls are also summarized in Table 10.2-2 with surface water quality guidelines for the protection of freshwater aquatic life. The calculated long term steady-state concentrations for all COPCs are less than the applicable guideline values. The long term steady-state concentrations are also typically less than the calculated concentrations at the end of the natural filling period. That means that the concentrations of COPCs in the pit water will decrease slowly from the values at the end of pit filling period toward the long term steady-state values. In other words, because of the small loading rates associated with the pit walls, the maximum predicted concentrations in the pit will be those at the end of pit filling and the values will decrease over the long term after pit outflow occurs. Chloride may represent an exception to this behavior. However, the predicted long term steady state concentration of chloride in the pit water was only about 1% of the guideline value. After fillings and the start of pit outflow, the pH is expected to be similar to that in local surface waters in the range of 6.5 to 7.5. Therefore, with accelerated pit filling the pit water quality will remain acceptable without risk to freshwater aquatic life or to humans.

11 Monitoring and Follow-up Program

Contingency plans are intended to address unforeseen circumstances which could result in a unexpected increases in predicted environmental effects. Additional monitoring and follow-up programs will be developed and implemented before licensing, during operations and before decommissioning to validate the current predictions and to further refine the geochemical characteristics and understanding of the mine materials.

11.1 Before Licensing

11.1.1 Additional Rock Testing Program

Although, the mine rock characterization included in this report was more than sufficient for the purposes of the Environmental Assessment stage, additional mine rock characterization will be conducted prior to licensing. The additional testing will be consistent with rock that will be expected from the updated mine plans and to provide more confidence in the current assessment. Additional mine rock samples can be selected from the existing catalogue of AREVA rock core samples and from new core samples collected during in the future for geotechnical and pit development purposes as well as for additional ore deposit definition, if performed prior to mining. Core samples from the proposed pupose-built pit location will be obtained to confirm the suitability of its location.

The mine rock sampling plan will collect drill core that represents rock within the pit shell but outside of the ore zone, as a means of complementing the database for the existing and proposed mine rock. This approach will utilize a large number of individual samples for statistical strength that will be developed into representative composite samples in order to economize on analytical costs while obtaining representation for large volumes of rock. Composite samples provide statistical strength while reducing analytical costs when they are correctly developed to represent individual rock types within reasonably representative spatial boundaries within the proposed pit shell.

Each composite sample will include approximately 10 individual drill core fragments in a 15 m interval, which is representative of the approximate bench height in the pit. In this manner, each composite sample will actually represent 10 samples and the 100 composites will represent approximately 1,000 individual samples. Composite samples will be submitted for total sulphur (by Leco), total carbon, and uranium content analyses. The total sulphur represents a conservative estimate of the acid potential (AP) and the carbon will act as a conservative estimate of the neutralization potential (NP) that are required for the acid base accounting (ABA) analysis to evaluate the NP/AP ratios. An NP/AP ratio of greater than 2 represents material that will be non-potentially acid generating (non-PAG) and thereby can be classified as either Type 1 or 2 rock, depending on the uranium content. This is a reasonable and appropriate approach for developing a

well-supported database of geochemical characteristics of mine rock. Selection will also be based on proximity to the ore body, hanging and foot walls within the open pit in order to provide spatial and geological representation of mine rock materials.

In addition, a second phase of humidity cell testing will be undertaken to better characterize the Type 2 mine rock in order to determine the loading or leaching rates of constituents under neutral pH conditions. Identifying and collecting mine rock that meets Type 2 classification will require some effort. Existing or new drill core be examined for uranium content and samples will be targeted to obtain rock with uranium contents between 80 and 250 mg/kg. Once sufficient mine rock has been collected from drill core with approximate uranium contents between 80 and 250 mg/kg, the samples can be submitted for sulphur content analyses. This will allow for the selection of collected samples with sulphur contents less than 0.1 %S to be consistent with Type 2 rock.

Results from the Type 1 mine rock HCTs indicated that there was no significant difference in metal leaching rates between the three sulphur content ranges tested, < 0.02 %S, 0.02 to 0.05 %S, and 0.05 to 0.1 %S; therefore, the following humidity cell tests for Type 2 mine rock are recommended:

- Main zone – a single humidity cell consisting of Type 2 mine rock (less than 0.1 %S; U between 80 and 250 mg/kg), and
- Andrew Lake - a single humidity cell consisting of Type 2 mine rock (less than 0.1 %S; U between 80 and 250 mg/kg).

The composite Type 2 mine rock samples created for both humidity cell tests will be submitted for metal content and acid base accounting analyses. The Type 2 mine rock HCTs will be conducted for a period of at least 20 weeks in order to properly estimate the associated COPC loading rates. The results from these humidity cells will be compared to the results from other humidity cells and to verify that loading rates are similar. If important differences are found, then additional testing may be undertaken. If results are similar to Type 1 results, both the Type 1 and Type 2 datasets may be pooled to refine the predictions for water quality resulting from contact water drainage from mine rock stockpiles.

11.2 During Operations

11.2.1 Water Quality from the TMF

A laboratory investigation was completed to evaluate the water quality implications for the tailings and Type 3 mine rock co-disposal scenario for the Kiggavik Pit. The results showed that all COPCs, with the possible exception of uranium, are expected to remain below guideline values for the protection of aquatic life in water leaving the pit. Uranium was identified as a COPC that may marginally exceed the surface water quality guideline in water leaving the pit after closure. However,

the results were based on very conservative assumptions and upper bound characteristics for pore water in the tailings and Type 3 rock. Therefore, during operations, additional testing will be performed on actual tailings from the mill and run-of-mine Type 3 rock to refine predictions of water quality after mine closure. Should the new testing confirm that uranium concentrations represent a risk to water quality without additional mitigation, then a mitigation test program will be developed and implemented to determine the most effective measures to manage uranium concentrations in the in-pit TMF facility that will contain the tailings and Type 3 rock. There are several potential mitigation options to control uranium concentrations and/or migration from the tailings and rock and a test program will focus on the optimization of uranium control, if required.

11.2.2 Mine Rock Geochemistry Validation

Extensive investigations into the geochemical properties of mine rock at Kiggavik and Sissons will continue to be undertaken during operation as part of a Mine Rock Optimization and Validation Program (MROVP). This program will focus on Type 3 mine rock and will provide further insight into the geochemical characteristics of the materials to validate our proposed long-term management plan. During operations, mine rock will be classified and segregated using grade-control methods and the criteria for sulphur and uranium contents as presented above. Type 1, 2 and 3 rock types will be stored and managed separately. The classification of the rock materials will also be verified by periodic sampling and testing of the separate stockpiles periodically. Record of the results will be maintained. If discrepancies are discovered, corrective actions will be taken to relocate materials as required with additional sampling and testing for further verification.

11.2.3 Purpose Built Pit Type 1 Rock

During development of the mine site, a purpose-built pit will be constructed to provide good quality aggregate for the construction of site infrastructure and serve as a reservoir for mill water needs. Exploration drilling will be completed to accurately define the extent of the proposed purpose-built pit and to delineate sufficient volumes of Type 1 rock required for construction purposes. The current mine design allows for a purpose pit volume of approximately 0.35 Mbcm (million bank cubic meters; in-situ volume prior to excavation) and it is conservatively estimated that 75% of the rock will be classified as Type 1 and 25% as Type 2. The proposed purpose built pit is more distant from the ore bodies; therefore, the excavated mine rock is likely to be less altered by mineralization. Nonetheless, the characteristics of the mine rock will be confirmed by testing and analysis of drill core samples to confirm that the Type 1 criteria will be met. If the drilling shows that insufficient Type 1 material will be available, additional drilling will be undertaken to adjust the pit design and locations of the pit boundaries to achieve the required Type 1 volumes.

The Type 1 rock from the purpose built pit will be evaluated in a similar manner as that completed for mine rock from the open pit mine operations, including bulk metal analysis, acid base accounting (ABA) using sulphur and carbon contents, selected humidity cell testing, and customized leach tests,

as warranted. The humidity cell tests are designed to assess the leaching properties of the mine rock materials when used in construction. The customized leach tests include shake flask testing and modified Special Waste Extraction Procedure (SWEP) tests to evaluate initial inventories of soluble constituents. The appropriate number of drill core samples will be selected for the laboratory evaluations based on recommended guidelines (e.g. Price, 1997; 2009).

11.2.4 Water Quality Monitoring

The Type 3 rock will be relocated to the pits at the end of mining. As the pits fill with water, the rock will be inundated and eventually fully submerged in water. Two types of testing and monitoring will be completed to understand the potential effects on the quality of water in the pit. Before the rock is relocated, it will be sampled and the soluble COPCs will be evaluated to quantify the potential effects on pore water in the rock after it is submerged. This testing will provide an estimate of the concentrations of COPCs in the pore water and if required will, additional mitigation measure can be considered prior to or during relocation to reduce concentrations of COPCs. The pore water quality in the rock after will also be verified as the pit fills with water but before the rock is fully submerged. Monitoring wells will be installed within the backfilled rock to monitor and compare to predicted water quality within the pits. Monitoring wells will also be installed in the active zone down-gradient of the permanent Type 2 mine rock stockpiles to monitor any seepage. It is also proposed to install shallow active layer monitoring wells down gradient of the Type 3 temporary stockpiles and ponds to ensure that no unexpected seepage or leakage from the temporary storage facilities occurs.

11.3 During Decommissioning

11.3.1 TMF Monitoring

Monitoring wells will be installed in the back-filled pit and in the active zone down gradient of the TMF containing the tailings and Type 3 rock. Monitoring in the pit will provide verification of the predicted water chemistry and the results will be used to refine and update the water quality predictions. The wells down gradient of the rehabilitated TMF will provide verification of predicted quality for water migrating from the pit.

11.3.2 Andrew Lake Pit

The water quality in the Andrew Lake pit was predicted for natural and enhanced filling rates. Enhanced filling can be accomplished by capturing spring runoff from the local watershed each year to accelerate the accumulation of water in the pit. the water elevation in the pit will be monitored to update the filling rate for either natural or enhanced filling.

Water quality in the pit will be monitored during the decommissioning period and the model predictions can be verified and refined if required. Contingency measures, such as pH adjustment are available to reduce metal concentrations and raise pH, if required.

12 Conclusion

An assessment was completed to characterize the physical and geochemical properties of the potential mine rock materials expected from the development of the Kiggavik Project as they relate to the long-term management. The proposed mine rock management plan for the Project was developed and evaluated to prevent adverse effects of mine rock on water in the receiving environment. The assessment included field and laboratory studies and geochemical interpretation synthesis to determine the management strategy.

Unlike the mine rock from uranium deposits in the Athabasca region of Northern Saskatchewan that have been shown to be a source of elevated arsenic concentrations when deposited under water, the results of the initial leaching tests of the Kiggavik and Andrew Lake material suggest that the mine rock from these sites does not appear to have similar arsenic leaching issues as the other materials from the Athabasca region.

The proposed segregation criteria for mine rock at the Kiggavik Uranium Project includes Type 1 material as clean rock that can be used for construction purposes and contains concentrations of uranium less than exemption quantities as per the Nuclear Safety and Control Act (1 Bq/g or 80 mg/kg) and a total sulphur content less than 0.1 %S. Type 2 material is defined as mine rock that can be permanently stockpiled and managed above ground and contains uranium contents less than 250 mg/kg and total sulphur contents be less than 0.1 %S. Type 3 material is defined as mine rock that requires specific management (e.g. in-pit disposal), and includes all rock that is not classified as Type 1 or 2 material or considered to be ore.

Type 2 mine rock from the Kiggavik Site will be placed in two permanent stockpiles. One permanent stockpile will be present at the Sissons Site to accommodate the Type 2 material from the Andrew Lake Pit. Stockpiles will be surrounded by perimeter ditches designed to collect runoff water from the stockpiles. It is proposed that Type 3 mine rock will be segregated and temporarily stored during operation in a stockpile adjacent to either the Main Zone or Andrew Lake pits. The Type 3 mine rock pad will include a single liner system with a double liner system in the sedimentation ponds. Runoff and water percolating through the temporary stockpiles will be collected using ditches and a holding pond. During decommissioning of the site, all Type 3 mine rock will be relocated for permanent storage within the Main Zone TMF or Andrew Lake Pit.

At the Kiggavik site, there are a few different proposals to manage both the tailings and Type 3 mine rock material, however they all essentially consist of an initial deposition of tailings followed by the deposition of the Type 3 mine rock, which would then be overlain by a portion of the Type 2 mine rock with a final layer of till cover. At the Andrew Lake site, only the Type 3 mine rock material will be first placed in the open pit followed by a 4 metre layer of Type 2 mine rock, which would finally be

covered with a 1 metre layer of till. Once all of the solid materials are place in the Andrew Lake pit, the pit will fill under accelerated conditions to submerge the placed materials. From a Project management perspective, the outcome of flooding the pit needs to be known before the end of the physical decommissioning period. Acceptable surface water quality in the flooded pit is a prerequisite to removing the dewatering berm in Andrew Lake and thus restoring the lake to its original state. As noted previously, the PDP (Tier 3, Technical Appendix 2R) is based on flooding the pit over six years. The analysis of water quality for an accelerated time of ten years thus provides a reasonable but conservative estimate of water quality for the PDP. The results of static and humidity cell testing of the mine waste materials were used to assess potential post-decommissioning effects on water quality. The three types of waste rock material were assessed for potential effects on site water quality in accordance with each of the proposed management strategies. Humidity cell test results were used to calculate anticipated loading rates in the field, according to the waste rock type, by applying adjustments for grain size and temperature. The field loading rates were used to estimate COPC loads and pore water concentrations expected from the permanently stored Kiggavik and Andrew Lake rock in the proposed stockpiles.

Based on conservative estimations, between 225 and 1,800 kg of Type 1 Kiggavik material per square meter and between 525 and 3,600 kg of Type 1 Andrew Lake material per square meter ca be used for construction purposes before the predicted dissolved uranium concentration in leachate from the rock begins to exceed CCME guidelines for the protection of freshwater aquatic life in local runoff..

The influence on the site water quality was assessed for the Type 2 mine rock material that will be permanently stored in surface stockpiles during operation and at closure at both the Kiggavik and Andrew Lake site. The calculations are considered conservative, such that the values likely represent maximum concentrations, and under actual field conditions many COPC concentrations will likely be much lower due to natural pH control and solubility limitations for some COPCs, and natural attenuation or chemical reactions that have not been accounted for in the calculations. The predicted discharge concentrations for Pointer Lake, which will receive drainage from the Kiggavik rock stockpile, exceed the CCME guidelines for aluminum while the predicted concentrations for Andrew Lake, which will receive drainage from the Andrew Lake rock stockpile, exceed the guideline values for aluminum, cadmium, copper, selenium and zinc based on mass balance and mixing predictions. However, predicted concentrations of cadmium, copper, selenium and zinc in Andrew Lake are based on detection limit values from the humidity cell test results and therefore are biased high and are likely to be lower in the field than the values predicted. Field testing of mine rock leaching will be incorporated in the mine rock management program in order to refine loadings estimates and water quality predictions for downstream waterbodies. The field teast will provide more realistic estimates of water quality effects without the need for overly conservative assumptions that have been applied to the laboratory results from humidity cell tests.

A laboratory assessment was completed to assess the water quality of the tailings-Type 3 mine rock co-disposal for the Kiggavik Site. The objective of the testing was to simulate the release of COPCs

from the tailings porewater to the water within the pore spaces of the overlying rock. The results showed that the quality of water in the active layer in the backfilled pit above the mine rock will meet surface water quality guidelines with the possible exception of uranium. Uranium was conservatively predicted to exceed the surface water quality guideline in water leaving the pit. That prediction will be reassessed after final characterization of the Type 3 rock is confirmed during licensing. If the conclusion is confirmed, additional mitigation measures will be tested and applied to effectively prevent any uranium exceedance in the water leaving the pit.

The predicted COPC concentrations in the Andrew Lake pit water with backfilled Type 3 mine rock and after natuarally filling with water were less than the CCME guideline values for all COPCs, except for aluminum, cadmium and chloride. However, the calculated aluminum concentration is considered to be very conservative as aluminum is pH sensitive, such that the expected pit water pH will likely result in lower aluminum concentrations. In addition, the estimated cadmium pit water concentration is also extremely conservative as the field loading rates used in the calculations were based on detection limit values from the humidity cell testing and actual loading rates will be less than those based on the humidity cell results. The predicted chloride concentrations were based on the conservative assumption that groundwater will represent 10% of the total volume and that proportion is likely an overestimate. Furthermore, the pit water quality can be improved with accelerated pit filling, which can effectively reduce concentrations of all COPCs to below the CCME guidelines by limiting the time for exposure and oxidation of the Type 3 mine rock above water.

The results of the extensive assessment of the mine rock materials produced during operation and post-closure and the effects on the site water quality has suggested that, if properly managed, the mine rock materials will not pose an environmental risk. The use of the Type 1 waste rock material for construction purposes will not present a risk of acid generation or substantial metal leaching. The permanently stored Type 2 waste rock material will not present an acid generating issue, although the initial contact water may require management prior to discharge in order to reduce any COPC concentrations and to prevent effects on downstream water quality. The temporarily stored Type 3 waste rock material will need to be managed through the appropriate containment and collection of all contact water, which will be treated before discharge. At closure the Type 3 Kiggavik and Andrew Lake rock materials will be relocated to their respective mined out pits and permanently stored underwater after the pits fill with water. The in-pit storage of those materials will protect the environment at and downstream of the site into the future.

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14 Tables

Table 4.1-1: List of Samples Evaluated for the Kiggavik Mine Rock and Andrew Lake Rock Geochemical Assessment

Andrew Lake	End Grid	Main Zone	Centre Zone	East Zone
ANDW09-01 (135-136)	ENDG-09-12 (361.6-362.2)	MZ09-01A (200-201)	CZ09-01 (108-109)	EZ08-01 (39.15-39.21)
ANDW09-01 (175-176)	ENDG-09-03 (372-372.5)	MZ09-01A (25-26)	CZ09-01 (159-160)	EZ08-01 (42-42.5)
ANDW09-01 (20-21)	ENDG-09-01 (269.5-270)	MZ09-01A (250.05-251.06)	CZ09-01 (19-20)	EZ08-01 (44.9-45)
ANDW09-01 (222-222.9)	ENDG-09-07 (114.42-114.92)	MZ09-01A (99.73-100.65)	CZ09-01 (198-199)	EZ08-01 (46.3-46.4)
ANDW09-01 (299-300)	ENDG-09-05 (297-297.5)	MZ09-02 (101-102)	CZ09-01 (239-240)	EZ08-01 (48-48.1)
ANDW09-01 (323-324)	ENDG-09-02 (238-238.45)	MZ09-02 (150-151)	CZ09-01 (267-268)	EZ08-01 (51-51.11)
ANDW09-01 (75-76)	ENDG-09-02 (320.5-321)	MZ09-02 (50.91-51.94)	CZ09-01 (60-61)	EZ08-01 (53-53.1)
ANDW-08-01 (25.0-25.5)	ENDG-09-02 (442.1-442.6)	MZ09-03 (114.22-174.85)	CZ08-01 (138-139)	EZ08-01 (54.8-54.9)
ANDW-08-01 (50.0-50.5)	ENDG-09-03 (195-195.5)	MZ09-03 (124.15-124.68)	CZ08-01 (171-172)	EZ08-01 (57-57.53)
ANDW-08-01 (75.0-75.5)	ENDG-09-04 (205.1-205.6)	MZ09-03 (74.5-75)	CZ08-01 (183-183.9)	EZ08-01 (59-59.1)
ANDW-08-01 (215.0-215.5)	ENDG-09-04 (368.4-369)	MZ-08-02 (29.5-30.0)	CZ08-01 (193.92-195)	EZ08-01 (61.04-61.14)
ANDW-08-01-007 (214.75-215.0)	ENDG-09-06 (233.45-234)	MZ-08-02 (85.0-85.5)	CZ08-01 (99-100)	EZ08-01 (63-63.1)
ANDW-08-01-008 (249.0-249.2)	ENDG-09-08A (261-261.5)	MZ-08-04 (110.0-110.5)	CZ07-01 (106-107)	EZ08-01 (64.96-65.06)
ANDW-08-03 (30.0-30.5)	ENDG-09-13 (172.5-173)	MZ-08-04-005 (136.26-136.50)	CZ07-01 (13-14)	EZ08-01 (66.95-67.1)
ANDW-08-03 (60.0-60.5)	END-08-02-008 (240.64-240.86)	MZ-08-04-006 (166.23-166.50)	CZ07-01 (20-21)	EZ08-01 (68.5-69)
ANDW-08-03 (80.0-80.5)	END-08-02-014 (418.22-418.43)	MZ-08-04 (189.06-189.32)	CZ07-01 (49-50)	EZ08-01 (71.5-71.6)
ANDW-08-03 (110.0-110.5)	END-08-03A-002 (60.0-60.25)	MZ-08-04-008 (216.18-216.41)	CZ07-01 (71.16-72.04)	
ANDW-08-03 (190.0-190.5)	END-08-03A-004 (104.50-104.72)	MZ-08-05 (19.5-20.5)	CZ07-02 (101-102.05)	
ANDW-08-03-002 (61.0-61.2)	END-08-03A-006 (159.70-159.90)	MZ-08-05 (39.5-40.0)	CZ07-02 (26-29)	
ANDW-08-03-004 (124.60-124.80)	END-08-03A-008 (220.88-221.10)	MZ-08-05-004 (123.56-123.84)	CZ07-02 (44-44.95)	
ANDW-08-04-005 (203.3-203.5)	END-08-03A-0012 (341.50-341.76)	MZ-08-06 (65.0-65.5)	CZ07-02 (48.95-49.95)	
ANDW-08-04-006 (227.50-227.78)	END08-01 (11.38-12)	MZ-08-06 (80.0-80.5)	CZ07-02 (95-95.85)	
ANDW-08-03-007 (202.46-202.71)	END08-01 (141-141.55)	MZ-08-07 (29.5-30.0)		
ANDW-08-04 (40.0-40.5)	END08-01 (176.4-177)	MZ-08-07-001 (30.0-30.32)		
ANDW-08-04 (60.0-60.5)	END08-01 (59.4-60)	MZ-08-16 (29.5-30.0)		
ANDW-08-04-007 (265.6-265.80)	END08-01 (86.23-87)	MZ08-03 (10.48-11)		
ANDW-08-05-010 (318.64-318.90)	END08-02 (131.5-132)	MZ08-03 (24-24.25)		
ANDW08-01 (17.5-18)	END08-02 (15-15.47)	MZ08-04 (151-151.5)		
ANDW08-01 (28.6-29.1)	END08-02 (190.9-192)	MZ08-04 (166.5-167.02)		
ANDW08-01 (49.1-49.6)	END08-02 (249-249.5)	MZ08-04 (211.5-211.84)		
ANDW08-01 (72-72.5)	END08-02 (35.5-36)	MZ08-04 (251.05-251.55)		
ANDW08-04 (36.5-37)	END08-03 (16.5-17)	MZ08-05 (129-129.5)		
ANDW08-04 (69-69.5)	END08-03 (21-21.5)	MZ08-05 (15-15.5)		
ANDW08-04 (95-95.75)	END08-03 (23.5-24)	MZ08-06 (72-72.3)		
ANDW08-05 (116.55-117)	END08-03 (29.5-30)	MZ08-06 (9-9.5)		
ANDW08-05 (13-13.5)	END08-03 (46.5-47)	MZ-07-01 (20-20.5)		
ANDW08-05 (29.5-30)	ENDG-07-01 (20-20.5)	MZ-07-01 (50-50.5)		
ANDW08-05 (69-69.4)	ENDG-07-01 (50-50.5)	MZ-07-01 (94-94.5)		
ANDW-07-01 (50-50.5)	ENDG-07-01 (140-140.5)	MZ-07-01 (105-105.5)		
ANDW-07-01 (80-80.5)	ENDG-07-01 (215-215.5)	MZ-07-03 (55-55.5)		
ANDW-07-01 (185-185.5)	END07-01 (253.45-254)	MZ-07-03 (100-100.5)		
ANDW-07-01 (200-200.5)	END07-01 (98-98.5)	MZ-07-03 (170-170.5)		
ANDW-07-01 (255-255.5)		MZ-07-03 (195-195.5)		
ANDW-07-02 (26-26.5)		MZ-07-04 (20-20.5)		
ANDW-07-02 (51-51.5)		MZ-07-04 (30-30.5)		
ANDW07-01 (17-18.16)		MZ-07-04 (40-40.5)		
ANDW07-01 (51.5-53)		MZ-07-05 (31-31.5)		
ANDW07-01 (75.9-76.9)		MZ-07-05 (38-38.5)		
ANDW07-01 (91-92)		MZ-07-05 (55-55.5)		
ANDW07-02 (31-31.96)		MZ07-01 (13-13.5)		
ANDW07-02 (44-44.7)		MZ07-01 (164-164.43)		
		MZ07-01 (209-209.56)		
		MZ07-01 (26-26.6)		
		MZ07-04 (7-7.5)		
		MZ07-04 (93.72-94.2)		
Total Number of Samples	Total Number of Samples	Total Number of Samples	Total Number of Samples	Total Number of Samples
51	42	55	22	16

NOTES:

ANDW = Andrew Lake; ENDG and END = End Grid; MZ = Main Zone; CZ = Centre Zone; EZ = East Zone

07; 08; 09 indicates year hole was drilled

-01 indicates drill hole number

Values in brackets represent sample depth in metres

Table 4.3-1: Summary of Material used in Humidity Cell Tests with Uranium and Sulphur Contents

Kiggavik Rock Humidity Cell Material								Andrew Lake Rock Humidity Cell Material			
Humidity Cell Name:	Drill Core Sample ID:	Uranium (U) mg/kg	Total S %	Humidity Cell Name:	Drill Core Sample ID:	Uranium (U) mg/kg	Total S %	Humidity Cell Name:	Drill Core Sample ID:	Uranium (U) mg/kg	Total S %
MZ > 250 (Type 3)	MZ-08-04-005 136.26-136.50	261	0.18	MZ 0.1 - 0.3 (Type 3)	EZ08-01 (68.5-69)	3.6	0.11	ANDW >250 (Type 3)	ANDW-07-01(200-200.5)	253	0.05
	MZ-07-01 (105-105.5)	264	<0.01		MZ07-01 (164-164.43)	21.2	0.13		ANDW08-05 (116.55-117)	254	<0.01
	MZ-07-05(31-31.5)	294	0.01		EZ08-01 (57-57.53)	3.1	0.14		ANDW-07-01(185-185.5)	268	0.04
	CZ07-01 (71.16-72.04)	500	0.16		MZ08-06 (9-9.5)	6.7	0.14		ANDW-08-04-006 227.50-227.78	452	0.01
	MZ-07-03(195-195.5)	550	0.09		MZ07-04 (7-7.5)	36.7	0.14		**Geomean**	297.03	0.02
	MZ-08-16 29.5-30.0	818	0.61		MZ08-04 (211.5-211.84)	26.5	0.15	ANDW <0.02 (Type 1)	ANDW07-02 (31-31.96)	2.8	0.01
	Geomean	407.17	0.07		MZ-08-04 189.06-189.32	85	0.15		ANDW07-01 (75.9-76.9)	4.1	<0.01
MZ <0.02 (Type 1)	EZ08-01 (54.8-54.9)	1.9	<0.01		EZ08-01 (61.04-61.14)	3	0.16		ANDW09-01 (323-324)	4.2	<0.01
	CZ09-01 (19-20)	3.2	0.01		EZ08-01 (59-59.1)	3.2	0.22		ANDW09-01 (75-76)	5.1	0.01
	EZ08-01 (53-53.1)	3.4	<0.01		EZ08-01 (66.95-67.1)	3.2	0.22		ANDW08-01 (17.5-18)	5.3	<0.01
	EZ08-01 (51-51.11)	3.7	<0.01		MZ-07-03(100-100.5)	7	0.24		ANDW08-05 (29.5-30)	6.2	<0.01
	EZ08-01 (42-42.5)	5.7	0.01		MZ-08-05 39.5-40.0	186	0.24		ANDW09-01 (299-300)	7.3	0.01
	CZ07-01 (13-14)	16.9	<0.01		MZ-07-05(55-55.5)	164.5	0.26		ANDW08-04 (69-69.5)	7.8	<0.01
	MZ-08-05 19.5-20.5	17	0.01		MZ08-04 (251.05-251.55)	30.2	0.28		ANDW09-01 (175-176)	8.8	0.01
	CZ07-02 (48.95-49.95)	18.5	<0.01		MZ08-05 (129-129.5)	35.4	0.28		ANDW-08-03 190.0-190.5	9	0.01
	MZ-08-04-006 166.23-166.50	22	0.01		**Geomean**	15.76	0.18		ANDW-08-03-002 61.0-61.2	9	0.01
	MZ-07-03(170-170.5)	24.8	0.01	MZ 0.3 - 0.5 (Type 3)	MZ09-01A (250.05-251.06)	9.4	0.3		ANDW08-01 (72-72.5)	10	<0.01
	CZ07-02 (26-29)	29.7	0.01		MZ-08-06 65.0-65.5	28	0.3		ANDW-08-03 80.0-80.5	10	0.01
	MZ-08-02 85.0-85.5	33	0.01		MZ08-04 (151-151.5)	33.7	0.3		ANDW08-04 (36.5-37)	12.4	0.01
	CZ07-01 (20-21)	62	0.01		MZ-08-04-008 216.18-216.41	29	0.31		ANDW08-05 (13-13.5)	13	0.01
	MZ-07-01 (50-50.5)	97.2	0.01		MZ-08-05-004 123.56-123.84	57	0.31		ANDW-08-01 25.0-25.5	15	0.01
	Geomean	13.61	0.01		MZ09-01A (200-201)	6	0.33		ANDW-08-01-007 214.75-215.0	18	0.01
MZ 0.02 - 0.05 (Type 1)	CZ08-01 (99-100)	23.5	0.02		MZ-09 03 (174.22-174.85)	3.9	0.37		ANDW-08-01 75.0-75.5	19	0.01
	CZ07-02 (44-44.95)	37.1	0.02		MZ08-03 (24-24.25)	3.1	0.44		ANDW09-01 (20-21)	21.4	<0.01
	MZ08-04 (166.5-167.02)	44.1	0.02		CZ08-01 (138-139)	3.7	0.46		ANDW08-05 (69-69.4)	23.3	<0.01
	MZ-07-04(20-20.5)	80.6	0.02		MZ09-02 (150-151)	3.2	0.47		ANDW-08-03 60.0-60.5	27	0.01
	MZ-08-04 110.0-110.5	121	0.02		CZ09-01 (239-240)	11.6	0.48		ANDW-08-04 40.0-40.5	27	0.01
	MZ07-01 (13-13.5)	13.5	0.03		**Geomean**	10.35	0.36		ANDW07-02 (44-44.7)	37.5	<0.01
	CZ07-01 (106-107)	18.9	0.03	MZ >0.5 (Type 3)	MZ07-01 (26-26.6)	30.9	0.53		ANDW-08-03 30.0-30.5	55	0.01
	MZ07-04 (93.72-94.2)	29.9	0.03		EZ08-01 (63-63.1)	3.5	0.58		ANDW08-04 (95-95.75)	58.9	<0.01
	CZ07-01 (49-50)	50	0.03		MZ09-03 (74.5-75)	3	0.59		**Geomean**	12.11	0.01
	MZ-07-05(38-38.5)	10.9	0.04		MZ-07-01 (20-20.5)	3.5	0.61	ANDW 0.02 - 0.1 (Type 1)	ANDW-08-01-008 249.0-249.2	<2	0.02
	CZ07-02 (95-95.85)	33.7	0.04		MZ08-05 (15-15.5)	8.8	0.65		ANDW08-01 (28.6-29.1)	3.2	0.02
	MZ-07-01 (94-94.5)	136.5	0.04		MZ-08-06 80.0-80.5	13	0.65		ANDW08-01 (49.1-49.6)	3.8	0.02
	MZ-08-02 29.5-30.0	3	0.05		MZ08-06 (72-72.3)	4	0.66		ANDW07-01 (51.5-53)	5.2	0.02
	MZ-07-04(40-40.5)	32	0.05		MZ-08-07 29.5-30.0	15	0.7		ANDW09-01 (222-222.9)	7	0.02
	MZ-07-04(30-30.5)	215	0.05		MZ-08-07-001 30.0-30.32	15	0.72		ANDW-07-02(26-26.5)	7.2	0.02
	Geomean	35.05	0.03		CZ09-01 (108-109)	2.8	0.78		ANDW07-01 (17-18.16)	3.9	0.03
MZ 0.05 - 0.1 (Type 1)	CZ07-02 (101-102.05)	8.7	0.06		CZ09-01 (198-199)	2.5	0.81		ANDW07-01 (91-92)	7.5	0.03
	MZ07-01 (209-209.56)	22.9	0.07		CZ09-01 (159-160)	3.3	0.84		ANDW-08-01 50.0-50.5	19	0.03
	MZ09-03 (124.15-124.68)	2.8	0.09		MZ09-01A (25-26)	3.6	0.85		ANDW-08-03 110.0-110.5	34	0.03
	Geomean	8.23	0.07		CZ09-01 (60-61)	4.8	0.91		ANDW-07-02(51-51.5)	43.9	0.03
					CZ09-01 (267-268)	2.8	0.98		ANDW-08-05-010 318.64-318.90	87	0.03
					CZ08-01 (171-172)	2.6	1.08		ANDW-08-03-007 202.46-202.71	208	0.03
					MZ09-02 (50.91-51.94)	3.6	1.16		ANDW-07-01(50-50.5)	3.9	0.04
					MZ-07-03(55-55.5)	6.5	1.21		ANDW-08-01 215.0-215.5	19	0.04
					MZ09-02 (101-102)	22.5	1.61		ANDW-08-03-004 124.60-124.80	33	0.04
					CZ08-01 (193.92-195)	2.5	1.64		ANDW-07-01(255-255.5)	33.4	0.04
					MZ09-01A (99.73-100.65)	3.3	1.65		ANDW-07-01(80-80.5)	8.5	0.05
					CZ08-01 (183-183.9)	2.8	1.83		ANDW-08-04-005 203.3-203.5	231	0.05
					Geomean	5.13	0.89		**Geomean**	14.71	0.03
								ANDW >0.1 (Type 3)	ANDW09-01 (135-136)	15.5	0.1
									ANDW-08-04 60.0-60.5	25	0.18
									ANDW-08-04-007 265.6-265.80	15	0.21
									Geomean	17.98	0.16

Table 4.3-2: Summary of Special Waste Material from Kiggavik Rock and Andrew Lake Rock Used for the Column Testing

Kiggavik Rock Special Waste Material	
Drill Core Sample ID	Mass Used (kg)
MZ-08-04 (47.0-47.5)	0.66
MZ-08-04 (47.5-48.0)	0.65
MZ-08-04 (48.0-48.5)	0.60
MZ-08-04 (48.5-49.0)	0.64
MZ-08-04 (49.0-49.5)	0.57
MZ-08-04 (49.5-50.0)	0.64
MZ-08-04 (50.0-50.5)	0.24
MZ-08-04 (50.5-51.0)	0.62
MZ-08-04 (51.0-51.5)	0.26
MZ-07-01 (60.7-61.2)	0.23
MZ-07-01 (66.5-66.6)	0.38
MZ-07-04 (35.0-35.5)	0.12
MZ-07-04 (35.5-36.0)	0.16
MZ-07-04 (43.0-43.5)	0.23
MZ-07-04 (43.5-44.0)	0.17
MZ-07-04 (44.5-45.0)	0.10
MZ-07-04 (45.5-46.0)	0.13
MZ-07-04 (49.5-50.0)	0.23
MZ-07-04 (50.0-50.5)	0.09
MZ-07-04 (50.5-51.0)	0.22
MZ-07-04 (51.0-51.5)	0.14
MZ-07-04	0.17
MZ-07-05 (18.4-18.9)	0.35
Total Mass Used	7.61

Andrew Lake Rock Special Waste Material	
Drill Core Sample ID	Mass Used
ANDW-07-01 (122.0-122.5)	1.04
ANDW-07-01 (124.0-124.5)	0.97
ANDW-07-01 (124.5-124.8)	0.34
ANDW-07-01 (222.0-222.5)	0.54
ANDW-07-01 (226.5-227.0)	0.55
ANDW-07-01 (238.5-239.0)	0.51
ANDW-07-01 (239.0-239.5)	0.26
ANDW-07-01 (238.5-239.0)	0.35
ANDW-07-02 (80.5-80.7)	0.24
ANDW-07-02 (92.5-93.0)	0.64
ANDW-07-02 (97.0-97.3)	0.34
Total Mass Used	5.78

TABLE 5.1-1: Summary of Metal Content and Acid Base Accounting for Kiggavik and Andrew Lake Drill Core Samples

Parameter	Units	10x Average Crustal Abundance[1]	Andrew Lake 51 Samples			End Grid 42 Samples			Main Zone 55 Samples			Centre Zone 22 Samples			East Zone 16 Samples		
			Geomean	Minimum	Maximum	Geomean	Minimum	Maximum	Geomean	Minimum	Maximum	Geomean	Minimum	Maximum	Geomean	Minimum	Maximum
Arsenic (As)	mg/kg	10	3.0	0.3	57	2.0	<0.2	14	0.7	<0.2	34	1.6	0.6	13	0.6	<0.2	5.3
Cadmium (Cd)[2]	mg/kg	1	0.09	<0.02	<1.0	0.04	<0.02	<1.0	0.06	<0.02	<1.0	0.03	<0.02	0.43	0.05	<0.02	2.54
Cobalt (Co)	mg/kg	290	3.6	0.30	31	6.5	1.3	113	9.3	1.1	177	11	2.3	51	14	8.2	31
Copper (Cu)	mg/kg	750	6.6	1.0	116	7.8	1.7	932	32	2.0	245	17	1.7	182	30	4.4	148
Molybdenum (Mo)	mg/kg	10	0.73	0.20	2.5	0.82	0.15	12	14	0.95	1940	5.6	0.46	218	0.78	0.18	2.6
Nickel (Ni)	mg/kg	1050	28	4.0	418	25	4.4	209	20	1.3	116	33	10.4	362	26	16	53
Lead (Pb)	mg/kg	80	9.3	2.6	50	5.9	2.1	38	29	3.6	169	17	3.3	288	9.7	2.6	117
Antimony (Sb)	mg/kg	2	0.34	0.05	3.0	0.20	<0.05	2.4	0.18	<0.05	1.0	0.10	0.05	0.43	0.13	0.07	0.22
Selenium (Se)	mg/kg	0.5	1.3	<1.0	6.0	1.1	<1.0	3.0	1.3	<1.0	7.0	1.6	1.0	3.0	1.1	1.0	2.0
Uranium (U)	mg/kg	9.1	17	<2.0	452	4.0	1.1	1370	23	2.8	818	11	2.5	500	4.2	1.9	9.2
Zinc (Zn)	mg/kg	800	13	<2.0	151	19	<2.0	120	25	5.0	83	35	3.0	122	79	33	567
Paste pH	---	---	7.5	7.0	8.3	7.9	6.9	8.9	8.4	7.2	9.3	8.4	7.4	9.0	8.5	7.5	9.5
Neutralization Potential (NP)	kg-CaCO3/t	---	6.0	1.0	30	8.0	1.0	82	13	3.8	72	12	2.0	45	11	6.0	19
Acid Generating Potential (AP)	kg-CaCO3/t	---	0.6	0.3	6.3	0.6	0.3	35	4.6	0.3	52	3.7	0.3	57	1.4	0.3	18
NP/AP	---	---	9.9	0.62	61	13	0.6	237	2.8	0.2	240	3.3	0.1	43	7.7	0.8	43
Total Sulphur	%	---	0.02	<0.01	0.21	0.02	<0.01	1.13	0.15	<0.01	1.65	0.12	<0.01	1.83	0.05	<0.01	0.58
Sulphate Sulphur	%	---	0.01	<0.01	0.05	0.01	<0.01	0.05	0.02	<0.01	0.05	0.02	<0.01	0.05	0.01	<0.01	0.02
Sulphide Sulphur	%	---	0.01	<0.01	0.20	0.02	<0.01	1.12	0.12	<0.01	1.61	0.10	<0.01	1.79	0.04	<0.01	0.56
Inorganic Carbon (C)	%	---	0.05	<0.05	0.09	0.09	<0.05	0.91	0.09	<0.05	0.52	0.08	<0.05	0.33	0.06	<0.05	0.13
CO2	%	---	0.21	<0.20	0.30	0.36	<0.20	3.3	0.34	<0.20	1.9	0.30	<0.20	1.20	0.24	<0.20	0.50

NOTES:
1 - From Faure, Gunter. 1998. Principles and Applications of Geochemistry. Prentice Hall. New Jersey.
2 - Detection limit varied for Cadmium
When value is reported as below detection, detection limit used for calculation of geometric mean.

TABLE 5.1-2: Summary of Leachable Metal Concentrations from SWEP Testing

Parameter	Units	Andrew Lake 51 Samples			End Grid 42 Samples			Main Zone 55 Samples			Centre Zone 22 Samples			East Zone 16 Samples		
		Geomean	Minimum	Maximum	Geomean	Minimum	Maximum	Geomean	Minimum	Maximum	Geomean	Minimum	Maximum	Geomean	Minimum	Maximum
pH	---	5.81	3.56	7.25	5.48	2.63	8.13	6.02	3.56	7.84	6.48	4.74	8.10	5.94	5.14	7.56
Arsenic (As)	mg/kg	0.005	<0.003	0.014	0.010	<0.003	0.175	0.007	<0.003	0.055	0.007	<0.003	0.060	0.004	0.003	0.037
	%	0.134	<0.007	1.40	0.456	<0.022	19.5	0.869	<0.096	16.6	0.440	<0.081	2.87	0.625	0.058	4.13
Cadmium (Cd)	mg/kg	0.0003	<0.0003	0.0005	0.0003	<0.0003	0.0009	0.0007	<0.0003	0.06	0.0003	<0.0003	0.0004	0.0003	<0.0003	0.0003
	%	0.3	<0.03	1.54	0.8	<0.03	3.34	0.8	<0.04	64	1.1	<0.07	2.00	0.6	<0.01	1.59
Cobalt (Co)	mg/kg	0.002	<0.001	0.004	0.002	<0.001	0.005	0.003	<0.001	0.814	0.002	<0.002	0.002	0.002	<0.001	0.002
	%	0.048	<0.005	0.514	0.024	<0.001	0.089	0.033	<0.006	8.14	0.014	<0.003	0.067	0.011	<0.005	0.019
Copper (Cu)	mg/kg	0.006	<0.003	0.054	0.006	<0.003	0.091	0.006	<0.003	2.01	0.006	<0.003	0.095	0.003	<0.003	0.003
	%	0.089	0.004	2.37	0.079	<0.0003	4.56	0.014	<0.001	6.56	0.036	0.002	0.831	0.010	<0.002	0.070
Molybdenum (Mo)	mg/kg	0.009	<0.003	0.105	0.011	<0.003	0.254	0.065	<0.003	22.2	0.014	0.003	0.158	0.004	<0.003	0.012
	%	1.19	0.207	10.5	1.26	<0.119	23.8	0.294	<0.006	42.8	0.255	0.003	5.17	0.518	<0.115	5.48
Nickel (Ni)	mg/kg	0.007	<0.006	0.021	0.006	<0.006	0.015	0.009	<0.006	0.694	0.006	<0.006	0.008	0.006	<0.006	0.006
	%	0.028	0.001	0.195	0.025	<0.003	0.139	0.052	<0.010	4.34	0.019	<0.002	0.077	0.023	<0.012	0.038
Lead (Pb)	mg/kg	0.003	<0.003	0.005	0.004	<0.003	0.064	0.004	<0.003	0.029	0.003	<0.003	0.009	0.003	<0.003	0.003
	%	0.034	<0.007	0.117	0.066	<0.016	0.464	0.011	<0.002	0.083	0.019	0.003	0.093	0.031	<0.003	0.119
Antimony (Sb)	mg/kg	0.015	<0.014	0.015	0.015	<0.015	0.015	0.017	<0.014	0.147	0.015	<0.015	0.015	0.015	<0.015	0.016
	%	3.72	<0.490	30.4	6.78	<0.637	30.8	6.77	<1.44	30.3	15.1	<3.57	30.4	11.7	<6.90	21.5
Selenium (Se)	mg/kg	0.015	<0.014	0.017	0.015	<0.015	0.015	0.019	<0.014	0.147	0.015	<0.015	0.015	0.015	<0.015	0.016
	%	1.16	<0.245	1.72	1.32	<0.499	1.55	1.40	<0.217	14.7	0.963	<0.512	1.54	1.40	<0.744	1.59
Uranium (U)	mg/kg	0.030	<0.014	3.84	0.018	<0.015	3.03	0.043	<0.014	14.9	0.024	<0.015	0.441	0.015	<0.015	0.016
	%	0.194	<0.006	2.15	0.475	<0.051	5.49	0.249	<0.045	5.62	0.218	<0.024	0.882	0.360	<0.167	0.793
Zinc (Zn)	mg/kg	0.015	<0.009	0.135	0.014	<0.009	0.070	0.013	<0.009	0.343	0.009	<0.009	0.011	0.009	<0.009	0.010
	%	0.127	<0.006	0.470	0.074	<0.008	0.454	0.051	<0.011	1.52	0.027	<0.008	0.306	0.012	<0.002	0.028

NOTES:

% = percentage of total constituent inventory leached during SWEP testing

TABLE 5.2-1: Summary of the Mass of Arsenic Leached From Kiggavik Rock Samples Drilled in 2007

Sample ID	Water:Solids Ratio	Residual Solids Content [1] (mg/kg)	Water Leachable[2] (mg/kg)	Total Leachable[2] (mg/kg)	Water Leachable (% of total)[3]	Total Leachable (% of total)[3]
ANDW-07-01 (185-185.5)	20:1	0.4	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	0.9	<	<	<	<
ANDW-07-01 (200-200.5)	3:1	0.9	<	<	<	<
ANDW-07-01 (255-255.5)	20:1	0.3	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	1.3	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	4.2	0.09	0.09	2.1%	2.1%
ANDW-07-01 (80-80.5)	3:1	4.2	0.005	0.061	0.1%	1.4%
ANDW-07-02 (26-26.5)	20:1	3.6	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	6.9	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	6.9	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	2.5	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	1.6	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	0.2	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	0.2	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	0.6	<	<	<	<
MZ-07-01 (20-20.5)	20:1	0.6	<	<	<	<
MZ-07-01 (50-50.5)	20:1	0.6	<	<	<	<
MZ-07-01 (94-94.5)	20:1	0.6	<	<	<	<
MZ-07-01 (94-94.5)	3:1	0.6	0.005	0.005	0.8%	0.8%
MZ-07-01 (105-105.5)	20:1	0.3	<	<	<	<
MZ-07-03 (55-55.5)	20:1	0.7	<	<	<	<
MZ-07-03 (100-100.5)	20:1	0.2	<	<	<	<
MZ-07-03 (170-170.5)	20:1	0.2	<	<	<	<
MZ-07-03 (170-170.5)	3:1	0.2	<	<	<	<
MZ-07-03 (195-195.5)	20:1	1.8	<	<	<	<
MZ-07-04 (20-20.5)	20:1	2.6	<	<	<	<
MZ-07-04 (20-20.5)	3:1	2.6	0.017	0.017	0.6%	0.6%
MZ-07-04 (30-30.5)	20:1	0.6	<	<	<	<
MZ-07-04 (40-40.5)	20:1	0.3	<	<	<	<
MZ-07-05 (31-31.5)	20:1	0.2	<	<	<	<
MZ-07-05 (31-31.5)	3:1	0.2	0.003	0.003	1.5%	1.5%
MZ-07-05 (38-38.5)	20:1	0.2	<	<	<	<
MZ-07-05 (55-55.5)	20:1	0.3	<	<	<	<

Notes:

1 - Indicates the residual As Content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero.

TABLE 6.1-1: Preliminary Classification of Mine Rock

Total S Content	NP/AP Ratio	Number of Samples	Percentage of Rock Meeting Criteria
Main, Centre and East Zone			
All Samples	>1	64	74%
(87 Samples)	>2	52	60%
	>4	39	45%
<0.1	>1	36	41%
(36 Samples)	>2	36	41%
	>4	35	40%
<0.2	>1	46	53%
(46 Samples)	>2	44	51%
	>4	37	43%
<0.3	>1	55	63%
(57 Samples)	>2	50	57%
	>4	39	45%
Andrew Lake			
All Samples	>1	45	96%
(47 Samples)	>2	44	94%
	>4	36	77%
<0.1	>1	44	94%
(45 Samples)	>2	43	91%
	>4	36	77%
<0.2	>1	45	96%
(46 Samples)	>2	44	94%
	>4	36	77%
<0.3	>1	45	96%
(47 Samples)	>2	44	94%
	>4	36	77%

Table 7.1-1: Summary of Metal Contents and Acid Base Accounting from the Type 1 and 3 Kiggavik Rock and Andrew Lake Rock Humidity Cell Composite Samples

Parameter	Units	10x Average Crustal Abundance1	Kiggavik Rock							Andrew Lake Rock			
			Type 1			Type 3				Type 1		Type 3	
			MZ < 0.02	MZ 0.02-0.05	MZ 0.05-0.1	MZ > 250	MZ 0.1-0.3	MZ 0.3-0.5	MZ > 0.5	ANDW < 0.02	ANDW 0.02-0.1	ANDW > 250	ANDW > 0.1
			Geomean	Geomean	Geomean	Geomean	Geomean	Geomean	Geomean	Geomean	Geomean	Geomean	Geomean
Aluminum (Al)	%	83	8.63	8.70	7.05	8.35	7.60	8.22	7.93	9.63	10.38	9.11	10.05
Arsenic (As)	mg/kg	10	0.94	1.07	0.36	1.42	0.42	0.67	1.04	3.33	3.21	1.26	3.36
Cadmium (Cd)	mg/kg	1	0.05	0.04	0.04	0.07	0.04	0.07	0.05	0.08	0.10	0.05	0.27
Chromium (Cr)	mg/kg	1850	48.71	47.35	22.74	55.15	28.08	37.70	57.80	96.90	70.56	42.02	172.91
Cobalt (Co)	mg/kg	290	8.82	9.14	6.32	9.27	9.72	8.63	14.18	3.76	3.68	2.40	2.98
Copper (Cu)	mg/kg	750	8.47	10.56	14.43	8.60	37.42	39.59	88.15	6.78	6.64	4.88	6.85
Manganese (Mn)	mg/kg	14000	137.60	117.43	292.89	184.07	227.89	272.21	331.36	70.42	84.86	81.08	74.89
Molybdenum (Mo)	mg/kg	10	1.19	2.77	25.08	14.34	9.80	20.00	19.45	0.73	0.64	0.67	1.12
Nickel (Ni)	mg/kg	1050	30.35	24.87	9.41	39.55	14.57	19.03	28.26	31.26	24.30	43.94	15.22
Lead (Pb)	mg/kg	80	8.41	18.73	21.13	46.40	28.80	0.16	0.15	8.99	8.33	20.90	8.36
Antimony (Sb)	mg/kg	2	0.19	0.12	0.07	0.24	0.16	30.79	33.65	0.34	0.36	0.15	0.63
Selenium (Se)	mg/kg	0.5	1.16	1.15	1.00	1.35	1.25	1.37	1.72	1.38	1.16	1.00	1.26
Strontium (Sr)	mg/kg	2600	32.88	56.93	123.09	26.65	123.68	123.89	208.07	111.37	98.41	46.66	198.44
Uranium (U)	mg/kg	9.1	13.61	35.05	8.23	407.17	15.76	10.35	5.13	12.11	16.44	297.03	17.98
Vanadium (V)	mg/kg	2300	56.97	62.07	27.64	124.04	30.02	30.86	60.46	43.19	64.83	106.66	31.40
Zinc (Zn)	mg/kg	800	23.91	25.69	36.49	20.80	29.56	26.34	51.87	11.87	15.80	12.32	7.49
Paste pH	---	---	8.01	8.01	8.55	7.95	8.61	8.69	8.83	7.42	7.60	7.40	7.69
Neutralization Potential (NP)	kg-CaCO3/t	---	7.88	7.42	15.52	9.07	10.50	17.10	17.48	5.77	6.30	6.57	4.85
Acid Generating Potential (AP)	kg-CaCO3/t	---	0.34	0.92	2.27	2.27	5.69	11.25	27.73	0.36	0.85	0.74	4.78
NP/AP	---	---	38.67	11.40	6.87	1.00	2.11	1.75	0.63	15.83	3.36	19.20	0.64
Total Sulphur	%	---	0.01	0.03	0.07	0.07	0.18	0.36	0.89	0.01	0.03	0.02	0.16
Sulphate Sulphur	%	---	0.01	0.02	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.01
Sulphide Sulphur	%	---	0.01	0.02	0.06	0.24	0.16	0.35	0.87	0.01	0.02	0.01	0.15
Inorganic Carbon (C)	%	---	0.05	0.05	0.09	0.08	0.07	0.16	0.11	0.05	0.06	0.06	0.05
CO2	%	---	0.20	0.21	0.33	0.33	0.28	0.57	0.41	0.20	0.23	0.23	0.20

NOTES:
1 - From Faure, Gunter. 1998. Principles and Applications of Geochemistry. Prentice Hall. New Jersey.
Reported values are weighted averages based on individual sample results.

TABLE 7.1-2: Summary of Calculated Laboratory Loading Rates for Kiggavik Rock and Andrew Lake Rock Material according to the Type 1, 2, 3 Criteria

Site Source:		Kiggavik Rock Waste Material		Andrew Lake Rock Waste Material	
COPC	Units	Type 1 and Type 2 Lab Loading Rate	Type 3 Lab Loading Rate	Type 1 and Type 2 Lab Loading Rate	Type 3 Lab Loading Rate
Sulphate (SO_4^{2-})	mg/kg/wk	1.89	1.93	1.98	2.71
Aluminum (Al)	mg/kg/wk	0.018	0.038	0.019	0.049
Arsenic (As)	mg/kg/wk	0.00021	0.00026	0.00023	0.00025
Cadmium (Cd)	mg/kg/wk	0.000012	0.000018	0.000012	0.000012
Chromium (Cr)	mg/kg/wk	0.00015	0.00016	0.00016	0.00019
Cobalt (Co)	mg/kg/wk	0.00017	0.00069	0.00012	0.00013
Copper (Cu)	mg/kg/wk	0.0010	0.0010	0.00066	0.00066
Manganese (Mn)	mg/kg/wk	0.0022	0.0047	0.00030	0.0011
Molybdenum (Mo)	mg/kg/wk	0.0012	0.0249	0.00014	0.00021
Nickel (Ni)	mg/kg/wk	0.00077	0.00095	0.00063	0.00065
Lead (Pb)	mg/kg/wk	0.000073	0.00014	0.000070	0.000087
Antimony (Sb)	mg/kg/wk	0.00012	0.00012	0.00012	0.00012
Selenium (Se)	mg/kg/wk	0.00016	0.00025	0.00012	0.00012
Strontium (Sr)	mg/kg/wk	0.0082	0.0261	0.0065	0.0094
Uranium (U)	mg/kg/wk	0.0075	0.0319	0.0010	0.0045
Vanadium (V)	mg/kg/wk	0.0012	0.0015	0.0012	0.0012
Zinc (Zn)	mg/kg/wk	0.0040	0.0038	0.0041	0.0041

Notes:

Calculated loading rates are the geomean averages of the loading rate for each humidity cell, according to the rock type criteria

When analytical data is reported as less than detection, the detection limit was used in the average calculation

Table 7.1-3: Summary of Mass Leached from Field Cells

Site Source		Kiggavik Rock Material				Andrew Lake Rock Material	
		Main Zone Field Cell		Centre Zone Field Cell		Andrew Lake Field Cell	
Parameter	Units	Average of Sample Events	Cumulative Mass Leached	Average of Sample Events	Cumulative Mass Leached	Average of Sample Events	Cumulative Mass Leached
Sulphate (SO_4)	mg/kg	4.45E-01	1.34E+00	9.02E-01	2.71E+00	3.85E+00	1.15E+01
Aluminum (Al)	mg/kg	3.36E-03	1.68E-02	3.79E-02	1.89E-01	1.70E-01	8.51E-01
Arsenic (As)	mg/kg	1.44E-04	7.21E-04	2.37E-04	1.19E-03	4.72E-04	2.36E-03
Cadmium (Cd)	mg/kg	1.28E-05	6.41E-05	1.10E-04	5.52E-04	1.60E-04	7.99E-04
Chromium (Cr)	mg/kg	9.50E-06	4.75E-05	2.22E-05	1.11E-04	8.12E-06	4.06E-05
Cobalt (Co)	mg/kg	6.11E-05	3.06E-04	3.53E-04	1.76E-03	7.64E-04	3.82E-03
Copper (Cu)	mg/kg	4.28E-03	2.14E-02	7.98E-05	3.99E-04	1.12E-04	5.58E-04
Manganese (Mn)	mg/kg	2.73E-04	1.37E-03	9.79E-04	4.89E-03	4.54E-04	2.27E-03
Molybdenum (Mo)	mg/kg	9.15E-05	4.58E-04	7.29E-04	3.64E-03	4.31E-04	2.16E-03
Nickel (Ni)	mg/kg	2.71E-03	1.36E-02	1.86E-03	9.30E-03	3.11E-03	1.56E-02
Lead (Pb)	mg/kg	2.81E-02	1.41E-01	3.57E-03	1.78E-02	8.13E-04	4.07E-03
Antimony (Sb)	mg/kg	4.23E-04	2.12E-03	2.72E-04	1.36E-03	8.84E-04	4.42E-03
Selenium (Se)	mg/kg	6.21E-05	3.10E-04	1.16E-04	5.81E-04	1.24E-04	6.19E-04
Strontium (Sr)	mg/kg	1.11E-03	5.56E-03	6.00E-03	3.00E-02	3.85E-02	1.92E-01
Uranium (U)	mg/kg	1.37E-04	6.85E-04	7.94E-03	3.97E-02	1.06E-02	5.32E-02
Vanadium (V)	mg/kg	1.55E-05	7.77E-05	2.64E-04	1.32E-03	2.29E-04	1.15E-03
Zinc (Zn)	mg/kg	2.15E-03	1.08E-02	3.45E-03	1.73E-02	5.45E-03	2.72E-02

Table 7.2-1: Summary of Calculated Field Loading Rates for Type 1, 2 and 3 Kiggavik Rock and Andrew Lake Rock Material

Site Source:		Type 1 and 2 Kiggavik Rock Material		Type 3 Kiggavik Rock Material		Type 1 and 2 Andrew Lake Rock Material		Type 3 Andrew Lake Rock Material	
COPC	**Units**	**Laboratory Loading Rate**	**Field Loading Rate[1,3]**	**Laboratory Loading Rate**	**Field Loading Rate[1,3]**	**Laboratory Loading Rate**	**Field Loading Rate[2,3]**	**Laboratory Loading Rate**	**Field Loading Rate[2,3]**
Sulphate (SO_4^{2-})	mg/kg/wk	1.89	0.011	1.93	0.011	1.98	0.046	2.71	0.063
Aluminum (Al)	mg/kg/wk	0.018	0.000106	0.038	0.00022	0.019	0.00043	0.049	0.00115
Arsenic (As)	mg/kg/wk	0.00021	0.0000012	0.00026	0.0000015	0.00023	0.000005	0.00025	0.00001
Cadmium (Cd)	mg/kg/wk	0.000012	0.00000007	0.00002	0.0000001	0.000012	0.0000003	0.00001	0.0000003
Chromium (Cr)	mg/kg/wk	0.00015	0.0000009	0.00016	0.0000009	0.00016	0.000004	0.00019	0.000004
Cobalt (Co)	mg/kg/wk	0.00017	0.0000010	0.00069	0.000004	0.00012	0.000003	0.00013	0.000003
Copper (Cu)	mg/kg/wk	0.0010	0.000006	0.0010	0.000006	0.00066	0.000015	0.00066	0.00002
Manganese (Mn)	mg/kg/wk	0.0022	0.000013	0.0047	0.00003	0.00030	0.000007	0.00111	0.00003
Molybdenum (Mo)	mg/kg/wk	0.0012	0.000007	0.0249	0.00015	0.00014	0.000003	0.00021	0.000005
Nickel (Ni)	mg/kg/wk	0.00077	0.000004	0.00095	0.0000056	0.00063	0.000015	0.00065	0.00002
Lead (Pb)	mg/kg/wk	0.000073	0.0000004	0.00014	0.0000008	0.000070	0.000002	0.00009	0.000002
Antimony (Sb)	mg/kg/wk	0.00012	0.000001	0.00012	0.0000007	0.00012	0.000003	0.00012	0.000003
Selenium (Se)	mg/kg/wk	0.00016	0.000001	0.00025	0.0000015	0.00012	0.000003	0.00012	0.000003
Strontium (Sr)	mg/kg/wk	0.0082	0.000048	0.0261	0.00015	0.0065	0.000153	0.0094	0.00022
Uranium (U)	mg/kg/wk	0.0075	0.000044	0.0319	0.0002	0.0010	0.000022	0.0045	0.00011
Vanadium (V)	mg/kg/wk	0.0012	0.000007	0.0015	0.000009	0.0012	0.000029	0.0012	0.00003
Zinc (Zn)	mg/kg/wk	0.0040	0.000023	0.0038	0.000022	0.0041	0.000095	0.0041	0.00010

Notes:

1 - Adjusted for surface area (particle size), such that 5% of stockpile material is similar size to Humidity Cell material

2 - Adjusted for surface area (particle size), such that 20% of stockpile material is similar size to Humidity Cell material

3 - Adjusted for field temperature, such that the rock pile is at 0oC for 8 months and 5oC for 4 months

Table 7.3-1: Summary of Results for the Initial Flush from the Type 1 and 3 Kiggaivk Rock and Andrew Lake Rock Humidity Cells

Parameter	Units	Kiggavik Rock							Andrew Lake Rock			
		Type 1			Type 3				Type 1		Type 3	
		MZ < 0.02	MZ 0.02-0.05	MZ 0.05-0.1	MZ > 250	MZ 0.1-0.3	MZ 0.3-0.5	MZ > 0.5	ANDW < 0.02	ANDW 0.02-0.1	ANDW > 250	ANDW > 0.1
Sulphate (SO_4)	mg/kg	8.2	35.5	7.4	125.2	24.5	72.9	38.6	17.1	68.7	7.9	22.3
Aluminum (Al)	mg/kg	0.34	0.34	0.37	0.50	0.44	0.31	0.68	0.25	0.15	0.30	0.12
Arsenic (As)	mg/kg	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01
Cadmium (Cd)	mg/kg	0.001	0.001	0.001	0.001	0.001	0.001	0.02	0.001	0.001	0.001	0.001
Chromium (Cr)	mg/kg	0.01	0.01	0.01	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt (Co)	mg/kg	0.005	0.01	0.005	0.07	0.03	0.06	0.02	0.005	0.01	0.005	0.005
Copper (Cu)	mg/kg	0.02	0.03	0.02	0.03	0.02	0.02	0.01	0.02	0.02	0.03	0.02
Manganese (Mn)	mg/kg	0.02	0.04	0.02	0.09	0.06	0.19	0.10	0.02	0.03	0.07	0.03
Molybdenum (Mo)	mg/kg	0.10	0.35	0.06	5.69	0.13	0.32	5.60	0.02	0.01	0.04	0.03
Nickel (Ni)	mg/kg	0.02	0.02	0.02	0.06	0.02	0.05	0.02	0.02	0.02	0.02	0.02
Lead (Pb)	mg/kg	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.03	0.01
Antimony (Sb)	mg/kg	0.05	0.05	0.05	0.004	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Selenium (Se)	mg/kg	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Strontium (Sr)	mg/kg	0.08	0.21	0.16	0.84	0.28	0.75	0.57	0.42	0.95	4.55	0.27
Uranium (U)	mg/kg	0.14	0.50	0.06	18.18	0.59	0.44	0.05	0.16	0.15	0.68	0.05
Vanadium (V)	mg/kg	0.03	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Zinc (Zn)	mg/kg	0.05	0.07	0.04	0.05	0.04	0.05	0.04	0.05	0.08	0.14	0.09

Table 7.3-2: Radiological Results for the Laboratory Humidity Cell and Column Tests

Parameter	Radium-226 (Ra-226)	Thorium-230 (Th-230)	Polunium-210 (Po-210)	Lead-210 (Pb-210)
Units	Bq/L	Bq/L	Bq/L	Bq/L
Column Tests				
Column ANDW-SW	24	0.014	0.07	0.82
Column MZ-SW	2.3	0.055	0.14	0.86
Laboratory Humidty Cells				
MZ > 250 (Day 0)	1.07	0.03	0.04	<0.1
MZ > 250 (Day 14)	0.63	0.042	0.011	<0.1
MZ > 250 (Day 140)	0.11	0.016	0.019	<0.1
MZ < 0.02 (Day 0)	0.04	0.1	0.015	<0.1
MZ < 0.02 (Day 14)	0.022	0.043	<0.01	<0.1
MZ < 0.02 (Day 140)	<0.01	<0.01	<0.01	<0.1
MZ 0.02-0.05 (Day 0)	0.19	<0.01	0.02	<0.1
MZ 0.02-0.05 (Day 14)	0.088	0.01	<0.02	<0.1
MZ 0.02-0.05 (Day 140)	<0.01	<0.01	0.018	<0.1
MZ 0.05-0.1 (Day 0)	<0.01	<0.01	<0.01	<0.1
MZ 0.05-0.1 (Day 14)	<0.01	<0.01	<0.01	<0.1
MZ 0.05-0.1 (Day 140)	<0.01	<0.01	<0.01	<0.1
MZ 0.1-0.3 (Day 0)	0.034	<0.01	<0.01	<0.1
MZ 0.1-0.3 (Day 14)	0.032	<0.01	<0.01	<0.1
MZ 0.1-0.3 (Day 140)	0.011	<0.01	<0.01	<0.1
MZ 0.3-0.5 (Day 0)	0.07	<0.01	<0.01	<0.1
MZ 0.3-0.5 (Day 14)	0.033	<0.01	0.013	<0.1
MZ 0.3-0.5 (Day 140)	<0.01	<0.01	0.03	<0.1
MZ > 0.5 (Day 0)	0.017	<0.01	<0.01	<0.1
MZ > 0.5 (Day 14)	<0.01	<0.01	<0.01	<0.1
MZ > 0.5 (Day 140)	<0.01	<0.01	0.011	<0.1
ANDW >250 (Day 0)	6	0.034	0.046	<0.1
ANDW >250 (Day 14)	1.66	<0.01	<0.01	0.2
ANDW >250 (Day 140)	0.028	0.011	0.011	<0.1
ANDW < 0.02 (Day 0)	0.22	<0.01	<0.01	<0.1
ANDW < 0.02 (Day 14)	<0.01	<0.01	<0.01	<0.1
ANDW < 0.02 (Day 140)	<0.01	<0.01	<0.01	<0.1
ANDW 0.02-0.1 (Day 0)	<0.01	<0.01	<0.01	<0.1
ANDW 0.02-0.1 (Day 14)	0.06	<0.01	<0.01	<0.1
ANDW 0.02-0.1 (Day 140)	<0.01	<0.01	<0.01	<0.1
ANDW > 0.1 (Day 0)	<0.01	<0.01	<0.01	<0.1
ANDW > 0.1 (Day 14)	<0.014	<0.01	<0.01	<0.1
ANDW > 0.1 (Day 140)	<0.01	<0.01	<0.01	<0.1

Table 7.3-3: Summary of Weighted Uranium and Total Sulphur Leached from Field Cells

Parameter	Units	Kiggavik Rock Material		Andrew Lake Rock Material
		MZHC	CZHC	ANDHC
Weighted Uranium Content	mg/kg	17.6	30.1	17.9
Weighted Total Sulphur Content	%	0.5	0.5	0.02

TABLE 7.3-4: Summary of Calculated Loading Rates for Kiggavik Rock and Andrew Lake Rock Column Testing

Site Source:		Kiggavik Rock Column	Andrew Lake Rock Column
COPC	**Units**	**MZ-SW**	**ANDW-SW**
Sulphate (SO_4^{2-})	mg/kg/wk	11.3	10.1
Aluminum (Al)	mg/kg/wk	0.03	0.008
Arsenic (As)	mg/kg/wk	0.002	0.001
Cadmium (Cd)	mg/kg/wk	0.00003	0.00002
Chromium (Cr)	mg/kg/wk	0.0007	0.001
Cobalt (Co)	mg/kg/wk	0.0001	0.0001
Copper (Cu)	mg/kg/wk	0.0007	0.0003
Manganese (Mn)	mg/kg/wk	0.004	0.027
Molybdenum (Mo)	mg/kg/wk	0.13	0.023
Nickel (Ni)	mg/kg/wk	0.002	0.002
Lead (Pb)	mg/kg/wk	0.0001	0.0001
Antimony (Sb)	mg/kg/wk	0.0001	0.0002
Selenium (Se)	mg/kg/wk	0.006	0.002
Strontium (Sr)	mg/kg/wk	0.04	0.67
Uranium (U)	mg/kg/wk	2.6	0.26
Vanadium (V)	mg/kg/wk	0.001	0.003
Zinc (Zn)	mg/kg/wk	0.001	0.001

Notes:

Calculated loading rates are the averages of the loading rate for each column

When analytical data is reported as less than detection, the detection limit was used in the average calculation

Table 9.1-1: Summary of the Estimated Concentrations Originating from Type 1 Kiggavik Rock and Andrew Lake Rock Used in Construction

Contaminant of Potential Concern	CCME Guideline for Freshwater Aquatic Life (mg/L)	Kiggavik Rock Material	Andrew Lake Rock Material
		MZ Type 1 Construction Rock Material (mg/L)	ANDW Type 1 Construction Rock Material (mg/L)
Sulphate (SO_4^{2-})	NV	3.76	31.42
Aluminum (Al)	0.005	0.036	0.296
Arsenic (As)	0.005	0.00042	0.00369
Cadmium (Cd)	0.000017	0.000025	0.00020
Chromium (Cr)	0.0089	0.00031	0.00258
Cobalt (Co)	NV	0.00034	0.00198
Copper (Cu)	0.002	0.0020	0.0134
Manganese (Mn)	NV	0.0043	0.0048
Molybdenum (Mo)	0.073	0.0023	0.0022
Nickel (Ni)	0.025	0.0015	0.0100
Lead (Pb)	0.001	0.00015	0.00112
Antimony (Sb)	NV	0.00025	0.00198
Selenium (Se)	0.001	0.00032	0.00198
Strontium (Sr)	NV	0.016	0.104
Uranium (U)	0.015	0.015	0.015
Vanadium (V)	NV	0.0025	0.0198
Zinc (Zn)	0.030	0.008	0.065

Notes:
NV = No Value
Highlighted values exceed the CCME guideline for the Freshwater Aquatic Life

Table 9.2-1. Predicted Discharge Concentrations from Pointer Lake and Andrew Lake

Constituent of Potential Concern	CCME Guideline for Freshwater Aquatic Life (mg/L)	Kiggavik[1]		Sissons[2]	
		Field Loading rate (mg/kg/wk)	Pointer lake Discharge (mg/L)	Field Loading rate (mg/kg/wk)	Andrew lake Discharge (mg/L)
Sulphate (SO_4^{2-})	NR	0.011	1.98	0.046	23.59
Aluminum (Al)	0.005	0.00011	**0.019**	0.00043	**0.22**
Arsenic (As)	0.005	1.24E-06	0.00022	5.42E-06	0.0028
Cadmium (Cd)	0.000017	7.25E-08	0.000013	2.91E-07	**0.00015**
Chromium (Cr)	0.0089	8.98E-07	0.00016	3.80E-06	0.0019
Cobalt (Co)	NR	9.85E-07	0.00018	2.91E-06	0.0015
Copper (Cu)	0.002	5.86E-06	0.0011	1.54E-05	**0.0079**
Manganese (Mn)	NR	1.27E-05	0.0023	7.03E-06	0.0036
Molybdenum (Mo)	0.073	6.80E-06	0.0012	3.23E-06	0.0017
Nickel (Ni)	0.025	4.48E-06	0.00080	1.47E-05	0.0075
Lead (Pb)	0.001	4.28E-07	0.000077	1.64E-06	0.0008
Antimony (Sb)	NR	7.25E-07	0.00013	2.91E-06	0.0015
Selenium (Se)	0.001	9.43E-07	0.00017	2.91E-06	**0.0015**
Strontium (Sr)	NR	4.77E-05	0.0086	1.53E-04	0.078
Uranium (U)	0.015	4.37E-05	0.0078	2.24E-05	0.011
Vanadium (V)	NR	7.25E-06	0.0013	2.91E-05	0.015
Zinc (Zn)	0.030	2.32E-05	0.0042	9.53E-05	**0.049**

Notes:

NR - Not Reported: No CCME guideline value for constituent

1 - Estimated quantities of broken Mine Rock include Type 1 and Type 2 materials from the Purpose Built Pit, East Zone, Centre Zone, and Main Zone sources

2 - Estimated quatities of broken Mine Rock include Type 1 and Type 2 materials from the Andrew Lake and End Grid sources

0.0005 Predicted Concentration exceeds CCME Guideline Value

Table 10.1-1: Summary of Field Loading Rates for Type 3 Material at Andrew Lake

Site Source:		Type 3 Andrew Lake Rock Material	
COPC	**Units**	**Laboratory Loading Rate**	**Field Loading Rate[1,2]**
Sulphate (SO_4^{2-})	mg/kg/wk	2.71	0.063
Aluminum (Al)	mg/kg/wk	0.049	0.00115
Arsenic (As)	mg/kg/wk	0.00025	5.73E-06
Cadmium (Cd)	mg/kg/wk	1.25E-05	2.91E-07
Chromium (Cr)	mg/kg/wk	0.00019	4.36E-06
Cobalt (Co)	mg/kg/wk	0.00013	3.04E-06
Copper (Cu)	mg/kg/wk	0.00066	1.53E-05
Manganese (Mn)	mg/kg/wk	0.00111	2.60E-05
Molybdenum (Mo)	mg/kg/wk	0.00021	4.80E-06
Nickel (Ni)	mg/kg/wk	0.00065	1.53E-05
Lead (Pb)	mg/kg/wk	0.00009	2.04E-06
Antimony (Sb)	mg/kg/wk	0.00012	2.91E-06
Selenium (Se)	mg/kg/wk	0.00012	2.91E-06
Strontium (Sr)	mg/kg/wk	0.0094	0.00022
Uranium (U)	mg/kg/wk	0.0045	1.05E-04
Vanadium (V)	mg/kg/wk	0.0012	2.91E-05
Zinc (Zn)	mg/kg/wk	0.0041	9.63E-05

Notes:

1 - Adjusted for surface area (particle size), such that 20% of stockpile material is similar size to Humidity Cell material

2 - Adjusted for field temperature, such that the rock pile is at $0^{o}C$ for 8 months and $5^{o}C$ for 4 months

Table 10.1-2: Summary of Calculated Pore Water Concentrations for Andrew Lake Rock Type 3 Material

COPC	Andrew Lake Waste Rock Material		
	Field Adjusted Loading rates (mg/kg/wk)	Pore Water Concentration (mg/L)	
		Upper Bound Infiltration (150 mm/yr)	Lower Bound Infiltration (50 mm/yr)
Sulphate (SO_4^{2-})	0.063	1315	3946
Aluminum (Al)	0.00115	24.0	71.9
Arsenic (As)	5.73E-06	0.12	0.36
Cadmium (Cd)	2.91E-07	0.0061	0.0182
Chromium (Cr)	4.36E-06	0.091	0.272
Cobalt (Co)	3.04E-06	0.063	0.190
Copper (Cu)	1.53E-05	0.32	0.96
Manganese (Mn)	2.60E-05	0.54	1.62
Molybdenum (Mo)	4.80E-06	0.10	0.30
Nickel (Ni)	1.53E-05	0.32	0.95
Lead (Pb)	2.04E-06	0.042	0.127
Antimony (Sb)	2.91E-06	0.061	0.182
Selenium (Se)	2.91E-06	0.061	0.182
Strontium (Sr)	0.00022	4.6	13.7
Uranium (U)	1.05E-04	2.2	6.6
Vanadium (V)	2.91E-05	0.61	1.82
Zinc (Zn)	9.63E-05	2.00	6.01

Table 10.1-3: Summary of Field Loading Rates for Pit Rubble Material and Pit Walls

Site Source:	Andrew Lake Pit Walls and Rubble			
COPC	**Laboratory Loading Rate (mg/kg/wk)**	**Field Loading Rate for Rubble [1] (mg/kg/wk)**	**Laboratory Loading Rate [2] ($mg/m^2/wk$)**	**Field Loading Rate for Walls [1] ($mg/m^2/wk$)**
Sulphate (SO_4^{2-})	2.71	0.32	2.20	0.26
Aluminum (Al)	0.049	0.0058	0.040	0.0047
Arsenic (As)	0.00025	2.86E-05	0.00020	2.32E-05
Cadmium (Cd)	1.25E-05	1.46E-06	1.01E-05	1.18E-06
Chromium (Cr)	0.00019	2.18E-05	0.00015	1.77E-05
Cobalt (Co)	0.00013	1.52E-05	0.00011	1.23E-05
Copper (Cu)	0.00066	7.66E-05	0.00053	6.21E-05
Manganese (Mn)	0.00111	1.30E-04	0.00090	1.06E-04
Molybdenum (Mo)	0.00021	2.40E-05	0.00017	1.95E-05
Nickel (Ni)	0.00065	7.64E-05	0.00053	6.20E-05
Lead (Pb)	0.00009	1.02E-05	7.09E-05	8.28E-06
Antimony (Sb)	0.00012	1.46E-05	0.00010	1.18E-05
Selenium (Se)	0.00012	1.46E-05	0.00010	1.18E-05
Strontium (Sr)	0.0094	0.0011	0.0076	0.00089
Uranium (U)	0.0045	0.00053	0.0037	0.00043
Vanadium (V)	0.0012	0.00015	0.0010	0.00012
Zinc (Zn)	0.0041	0.00048	0.0033	0.00039

Notes:

1 - Adjusted for field temperature, such that the rock pile is at 0^oC for 8 months and 5^oC for 4 months

2 - Converted from mg/kg/wk rate to $mg/m^2/wk$ using estimated surface area of material in humidity cells

Table 10.2-1: Summary of Mass Loads from each Source for Sulphate and Uranium with Different Filling Rates

Andrew Lake Loads for Sulphate and Uranium							
COPC	Filling Time (a)	Filling Rate (m^3/a)	Pit Wall Load (mg)	Pit Rubble Load (mg)	Pore Water Load[1] (mg)	Re-Placed Material Load (mg)	**Total Load (mg)**
Sulphate	10.0	4.28E+06	1.06E+08	8.86E+08	2.99E+11	0	3.00E+11
	100.1	4.28E+05	1.06E+09	8.86E+09	2.99E+11	1.49E+10	3.24E+11
	478.3	8.96E+04	5.06E+09	4.23E+10	2.99E+11	7.10E+10	4.17E+11
Uranium	10.0	4.28E+06	1.76E+05	1.47E+06	4.97E+08	0	4.99E+08
	100.1	4.28E+05	1.76E+06	1.47E+07	4.97E+08	2.49E+07	5.38E+08
	478.3	8.96E+04	8.42E+06	7.04E+07	4.97E+08	1.18E+08	6.94E+08

Notes:
1 - Pore Water Load calculated using the upper bound infiltration of 150 mm/yr

Table 10.2-2 Summary of Calculated Andrew Lake Pit Water Concentrations after Flooding

COPC	Units	CCME Guideline for Protection of Aquatic Life	Andrew Lake Pit Water Concentrations after Natural Filling	Andrew Lake Pit Water Concentrations after Accelerated Filling (10Years)	Steady-State Pit Water Concentrations from Exposed Pit Walls
pH	pH units	6.5 – 9.0	6 – 7	6 – 7	6.5 – 7.5
Hardness (as $CaCO_3$)	mg/L	NR[2]	28	18	Less than 10
Sulphate (SO_4^{2-})	mg/L	NR	9.7	7.0	0.026
Aluminum (Al)	mg/L	0.005 – 0.100	0.178	0.019	0.00047
Arsenic (As)	mg/L	0.005	0.00088	0.00009	2.36E-06
Cadmium (Cd)[1]	mg/L	0.000017	0.000045	0.000005	1.20E-07
Chloride	mg/L	120	170	0.4	1.7
Chromium (Cr)	mg/L	0.0089	0.00067	0.00007	1.80E-06
Cobalt (Co)	mg/L	NR	0.00047	0.00005	1.25E-06
Copper (Cu)[1]	mg/L	0.002	0.00236	0.00025	6.31E-06
Manganese (Mn)	mg/L	NR	0.0040	0.0004	1.07E-05
Mercury	mg/L	0.000026	TBD[3]	TBD	TBD
Molybdenum (Mo)	mg/L	0.073	0.00074	0.00008	1.98E-06
Nickel (Ni)[1]	mg/L	0.025	0.00235	0.00025	6.30E-06
Lead (Pb)[1]	mg/L	0.001	0.00031	0.00003	8.41E-07
Antimony (Sb)	mg/L	NR	0.00045	0.00005	1.20E-06
Selenium (Se)	mg/L	0.001	0.00045	0.00005	1.20E-06

Strontium (Sr)	mg/L	NR	0.034	0.004	9.02E-05
Uranium (U)	mg/L	0.015	0.016	0.012	4.33E-05
Vanadium (V)	mg/L	NR	0.0045	0.0005	1.20E-05
Zinc (Zn)	mg/L	0.03	0.0148	0.0016	3.97E-05

15 Figures

Areva Resources Canada - Kiggavik Project

Kiggavik Mine Rock Field Humidity Cells

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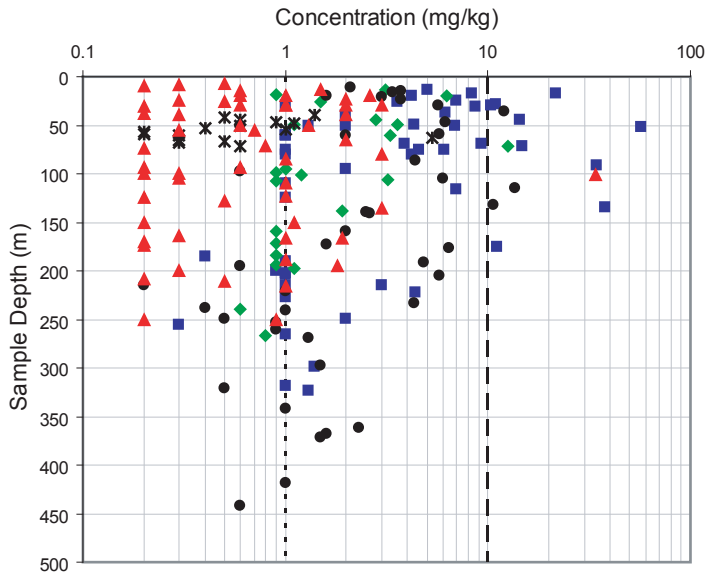
June 2011

Figure 4.3-1

Arsenic



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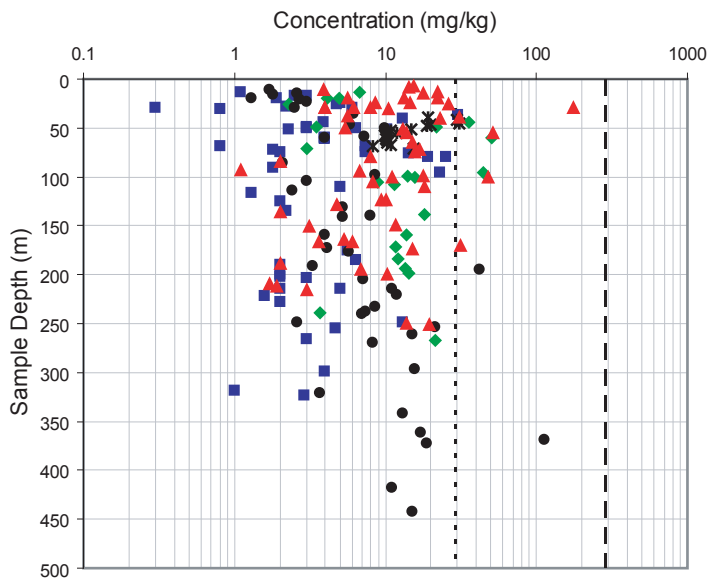

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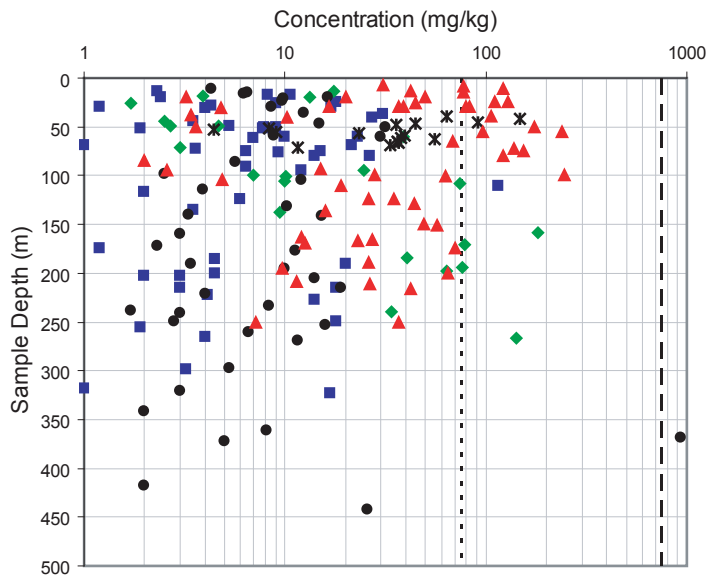

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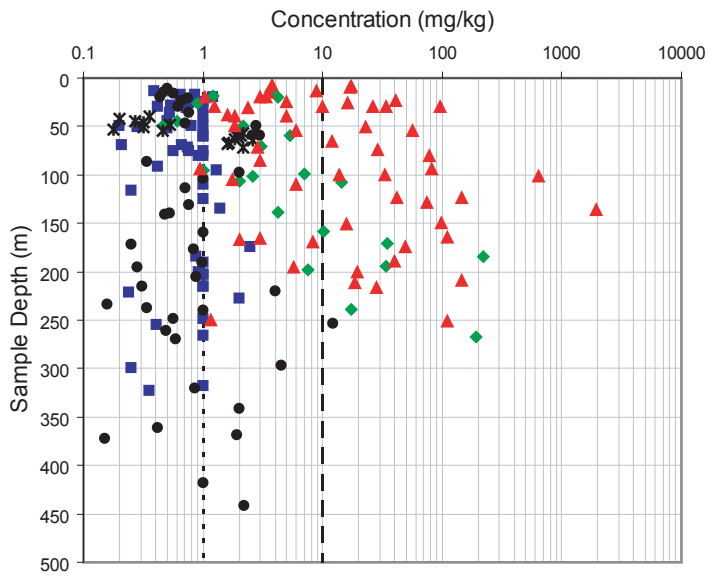

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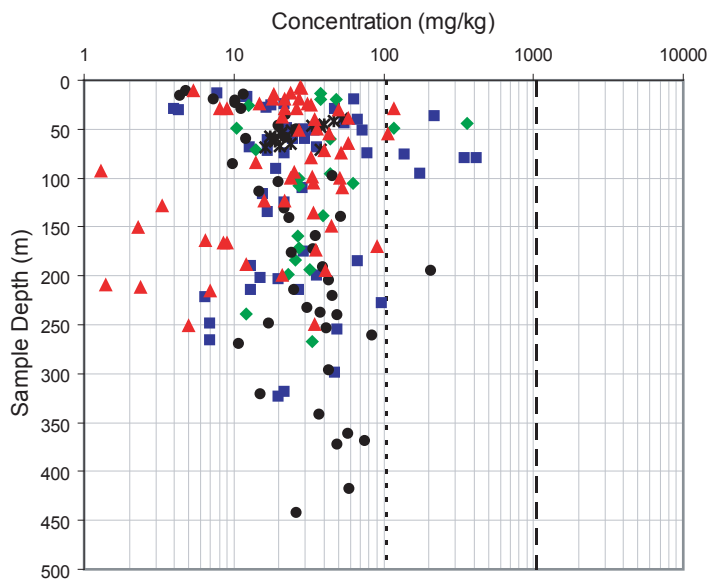

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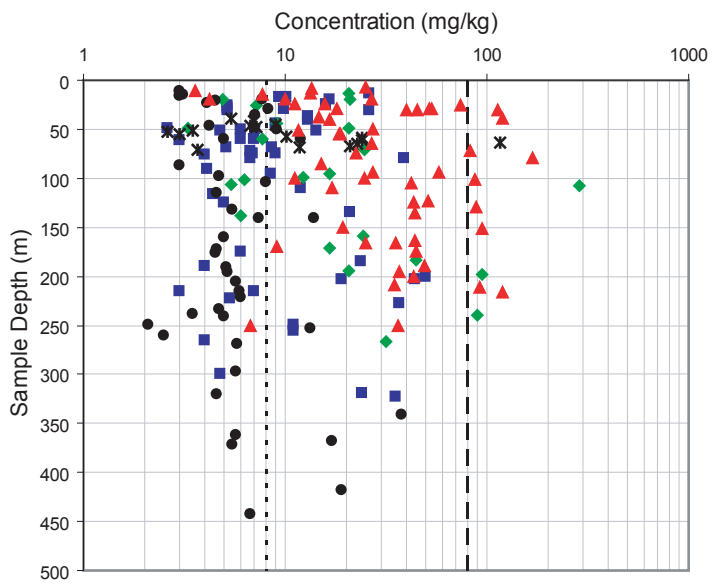
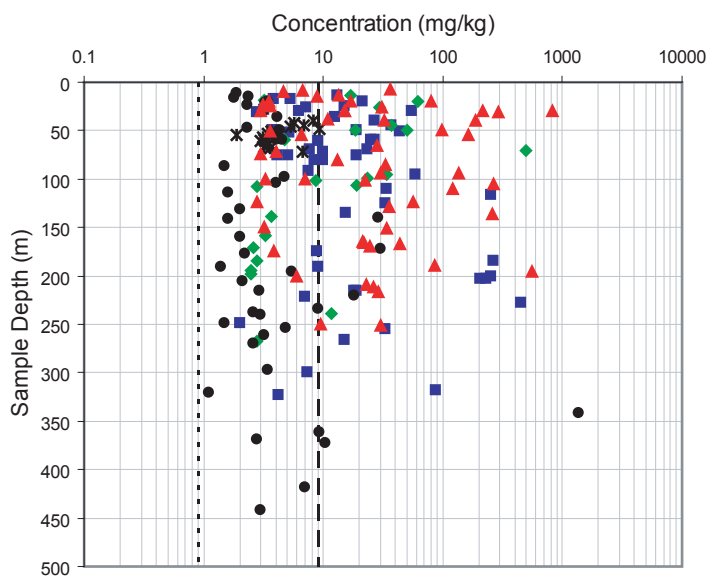
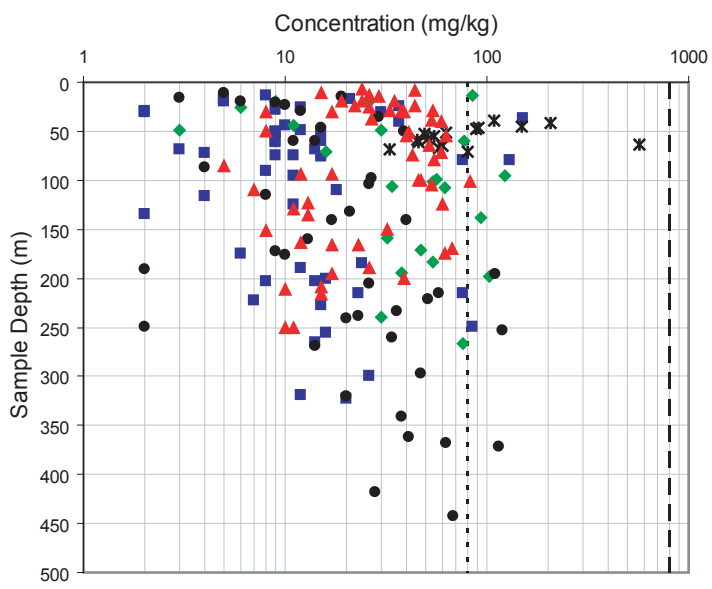


Uranium



Zinc



ANDREW LAKE END GRID

MAIN ZONE CENTRE ZONE EAST ZONE

Average Crustal Abundance

10x Average Crustal Abundance

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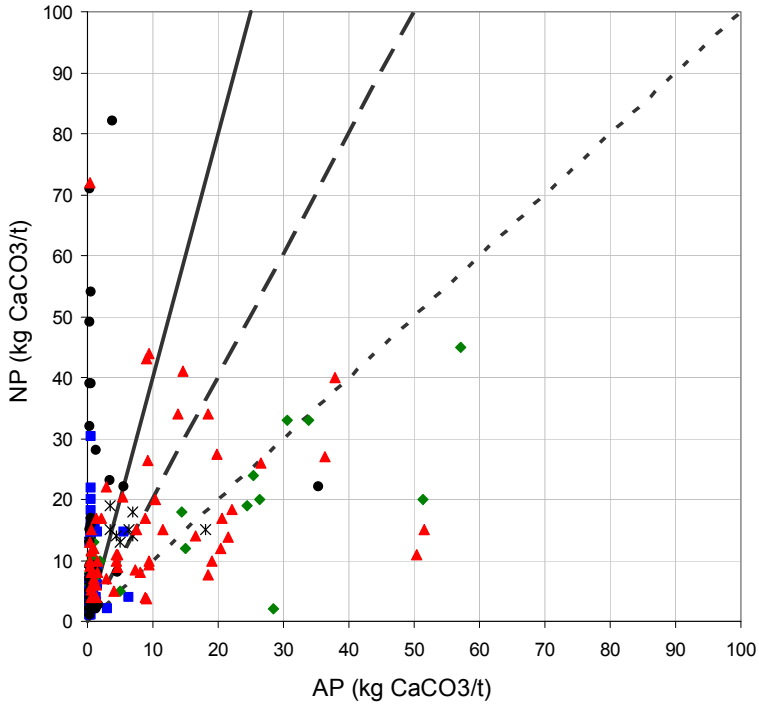
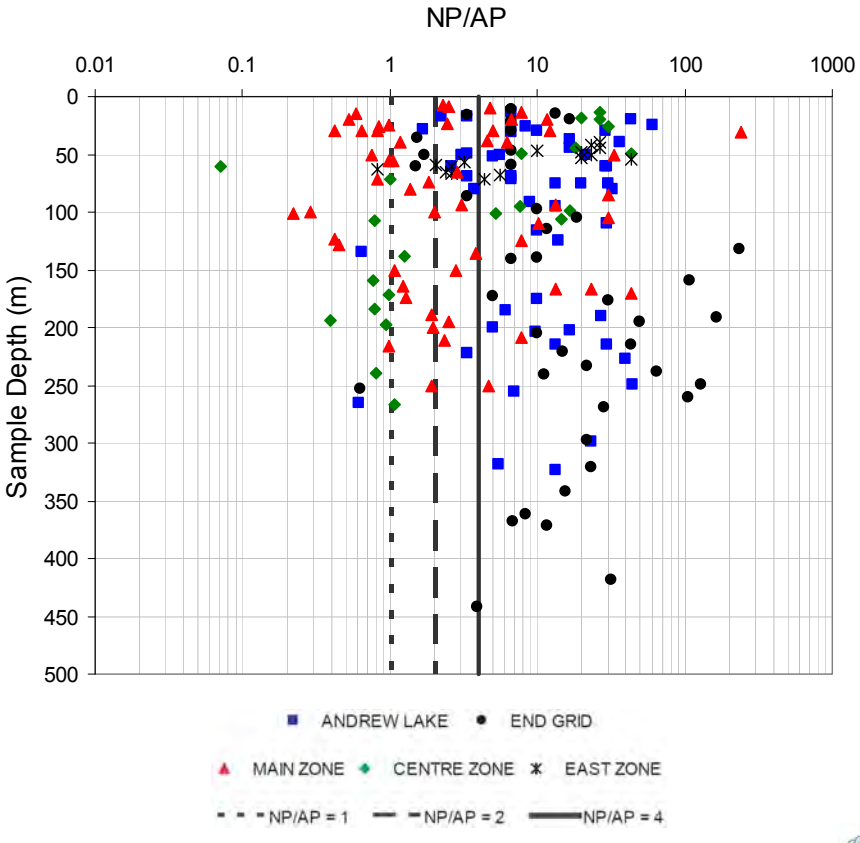
Summary of Metal Contents as a Function of Depth

EcoMetrix INCORPORATED | June 2011 | **Figure 5.1-1**



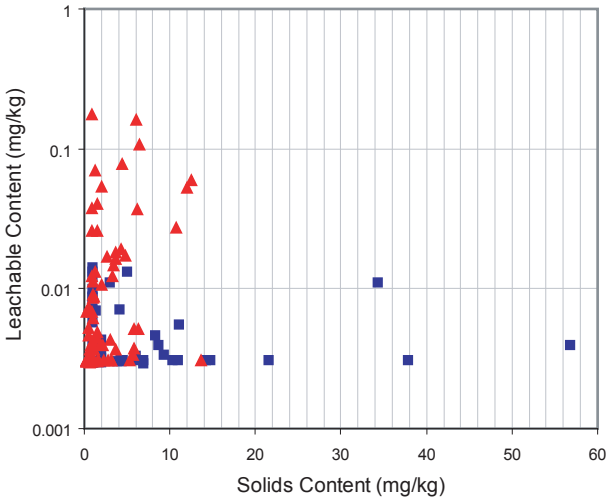


EcoMetrix INCORPORATED

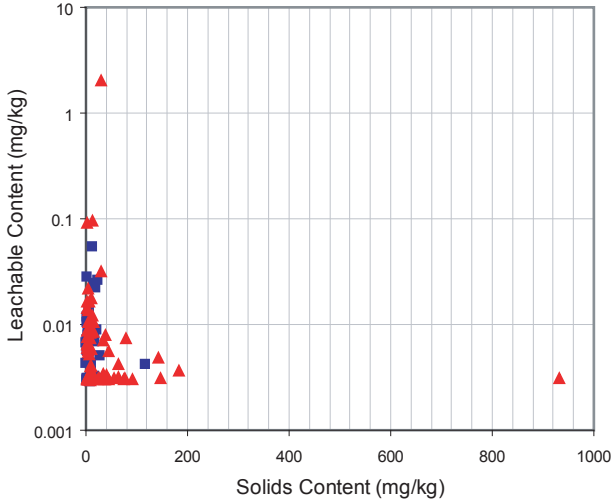
Technical Appendix 5F
Mine Rock Characterization and Management
December, 2011

Figure 5.1-2
Summary of ABA Results – Neutralization Potential Ratio

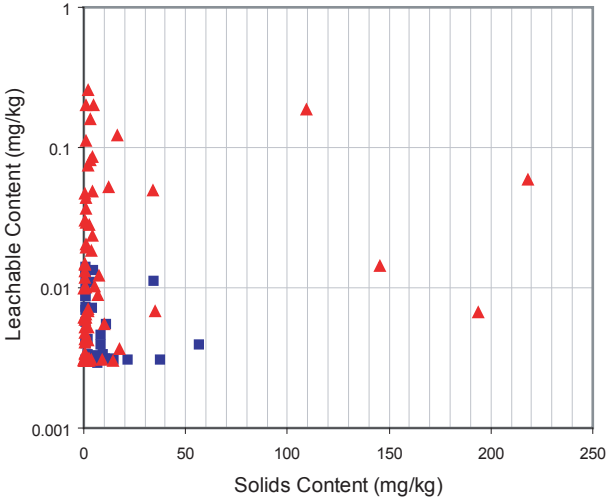
Arsenic



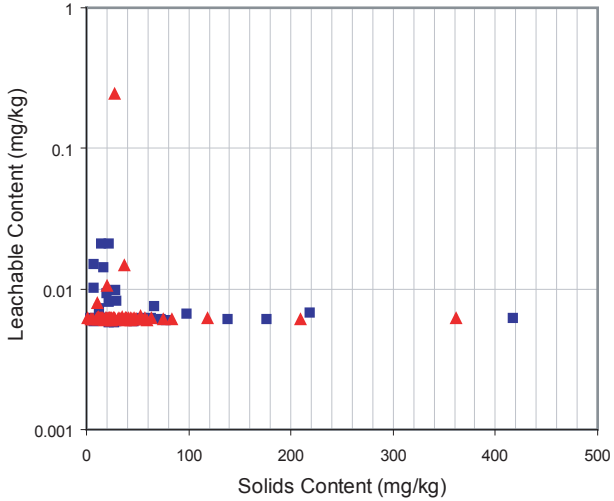
Copper



Molybdenum



Nickel



■ Andrew Lake ▲ Main Zone

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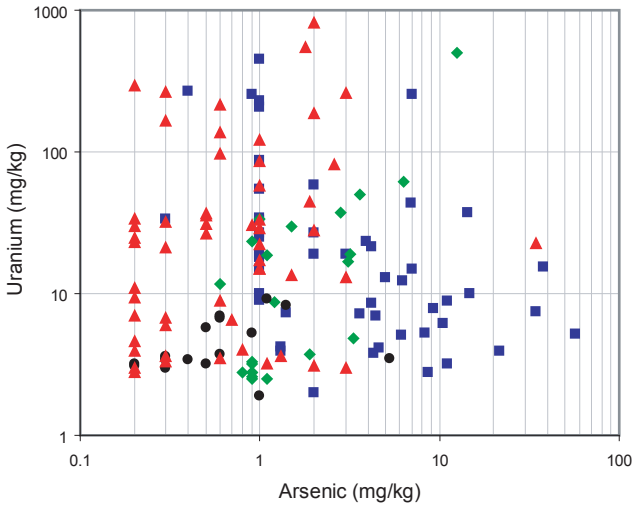
Comparison of Leachable Arsenic, Copper, Molybdenum and Nickel with Solid Content

EcoMetrix INCORPORATED

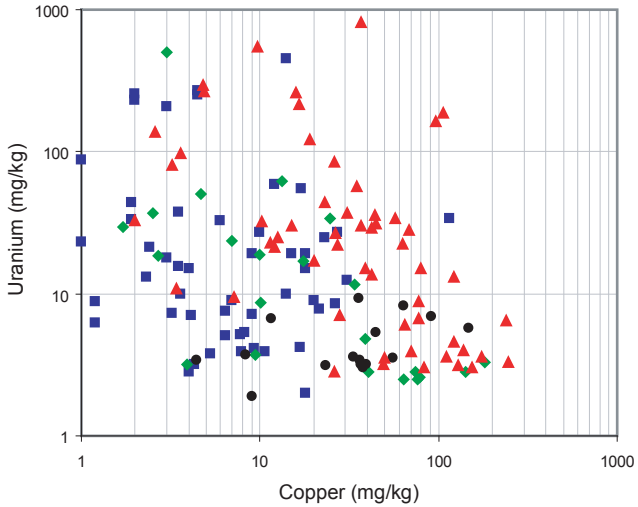
June 2011

Figure 6.1-1

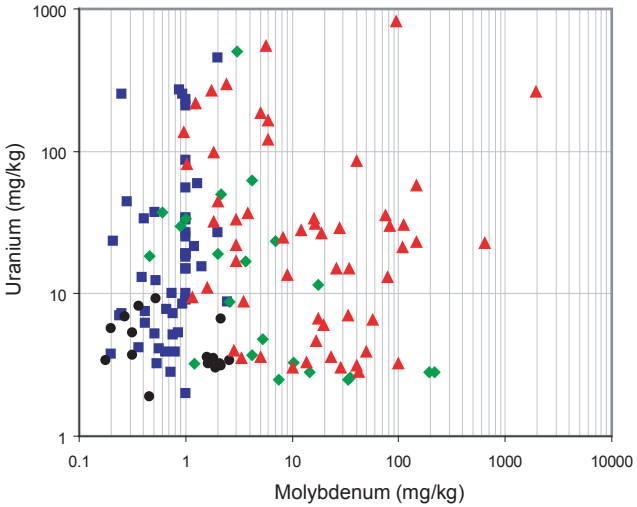
Arsenic



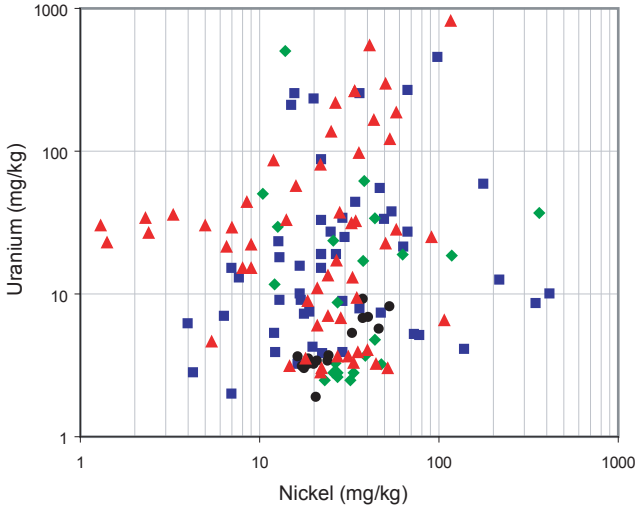
Copper



Molybdenum



Nickel



■ ANDREW LAKE ◆ CENTRE ZONE ● EAST ZONE ▲ MAIN ZONE

Areva Resources Canada - Kiggavik Project

Comparison of Leachable Arsenic, Copper, Molybdenum and Nickel with Leachable Uranium

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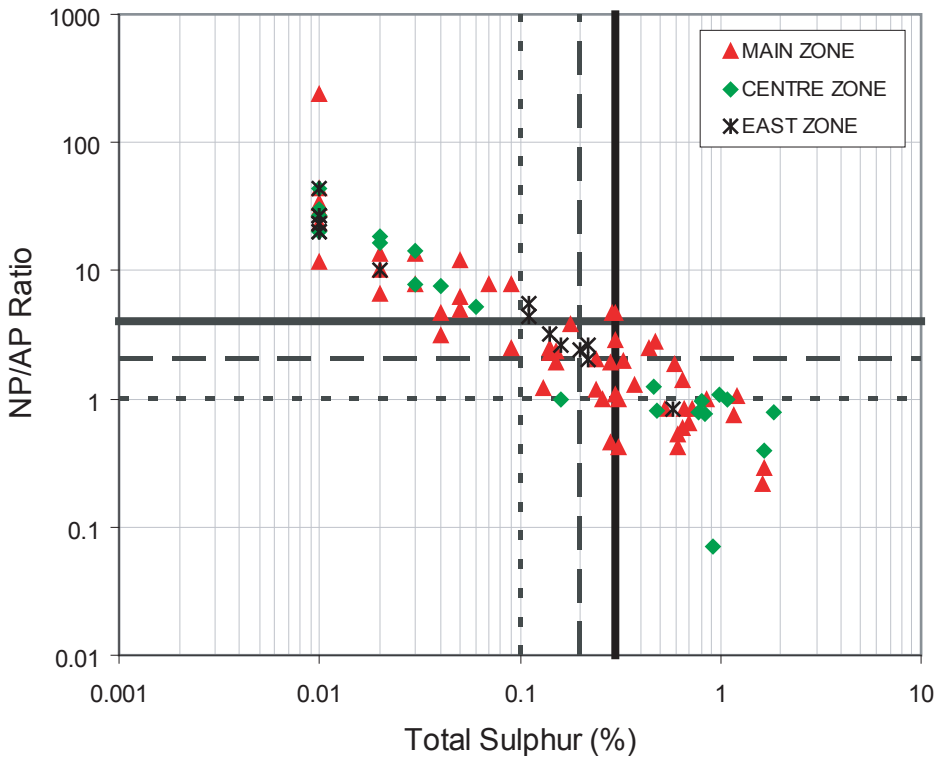
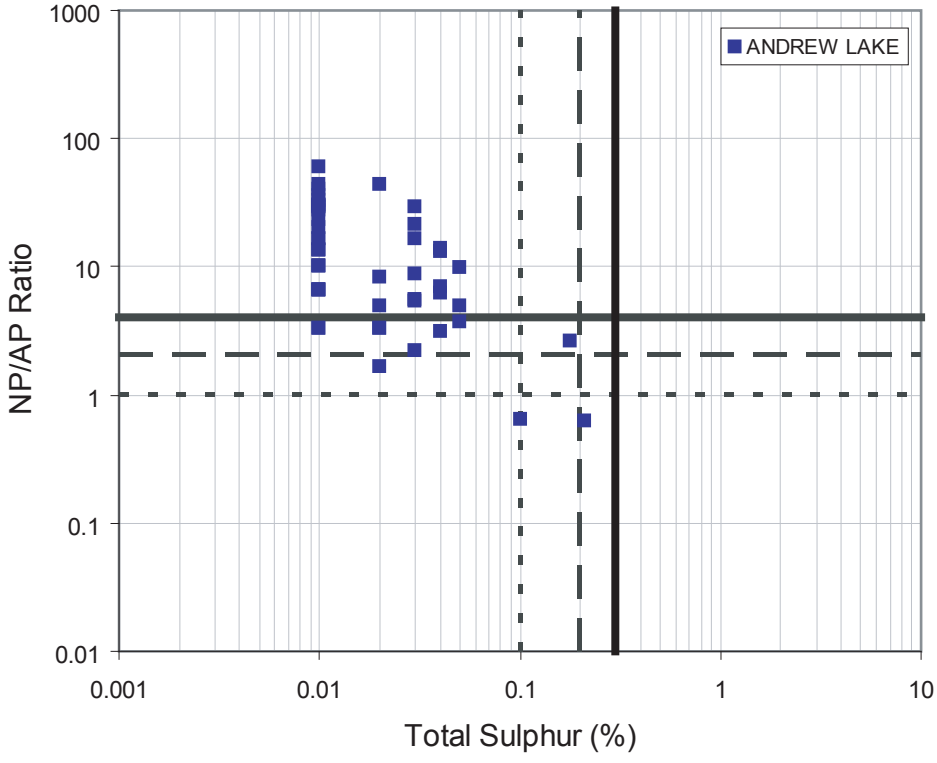
Figure 6.1-2





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Correlation Between NP/AP Ratio and Total Sulphur Content For Kiggavik Mine Rock

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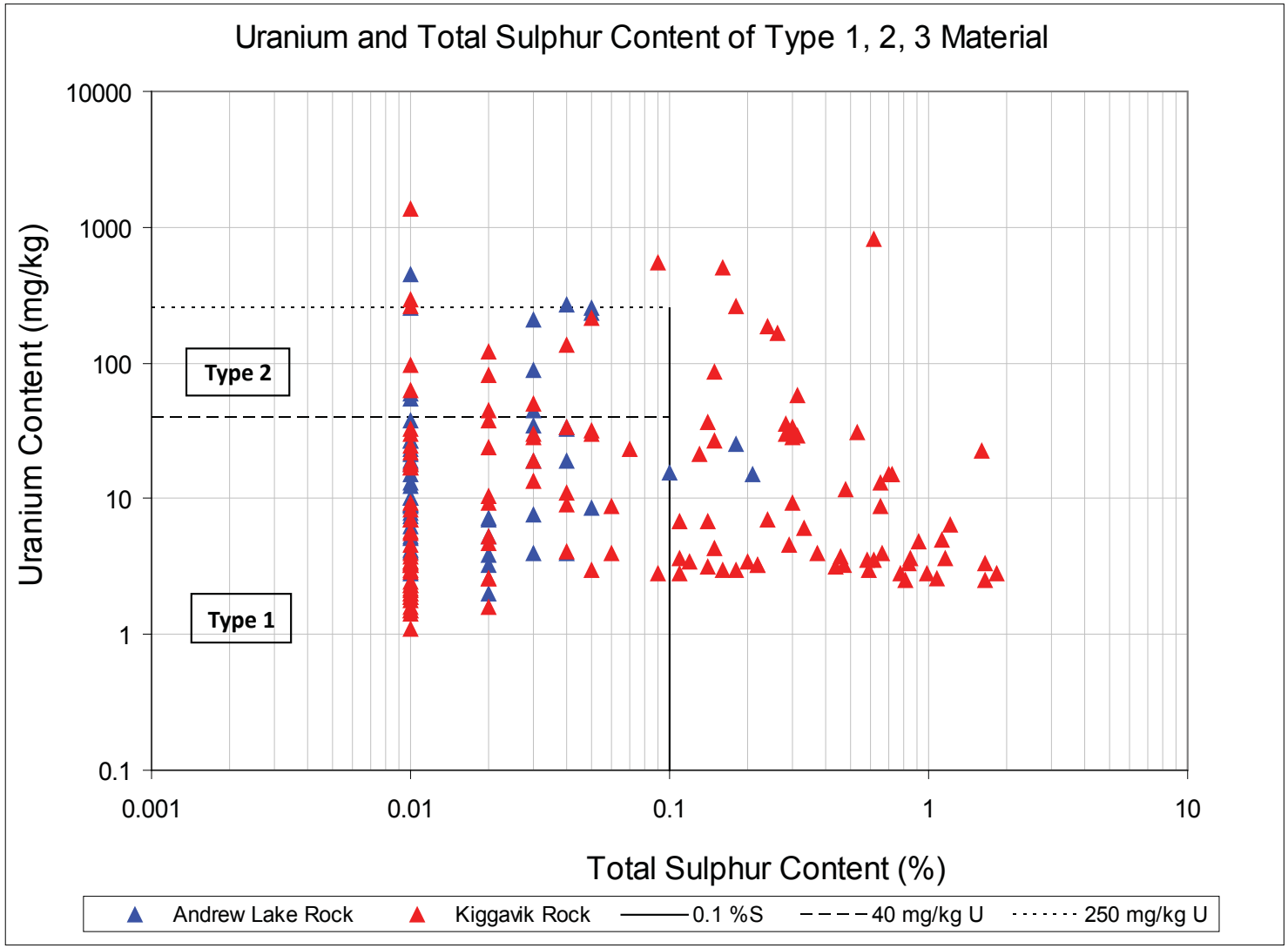
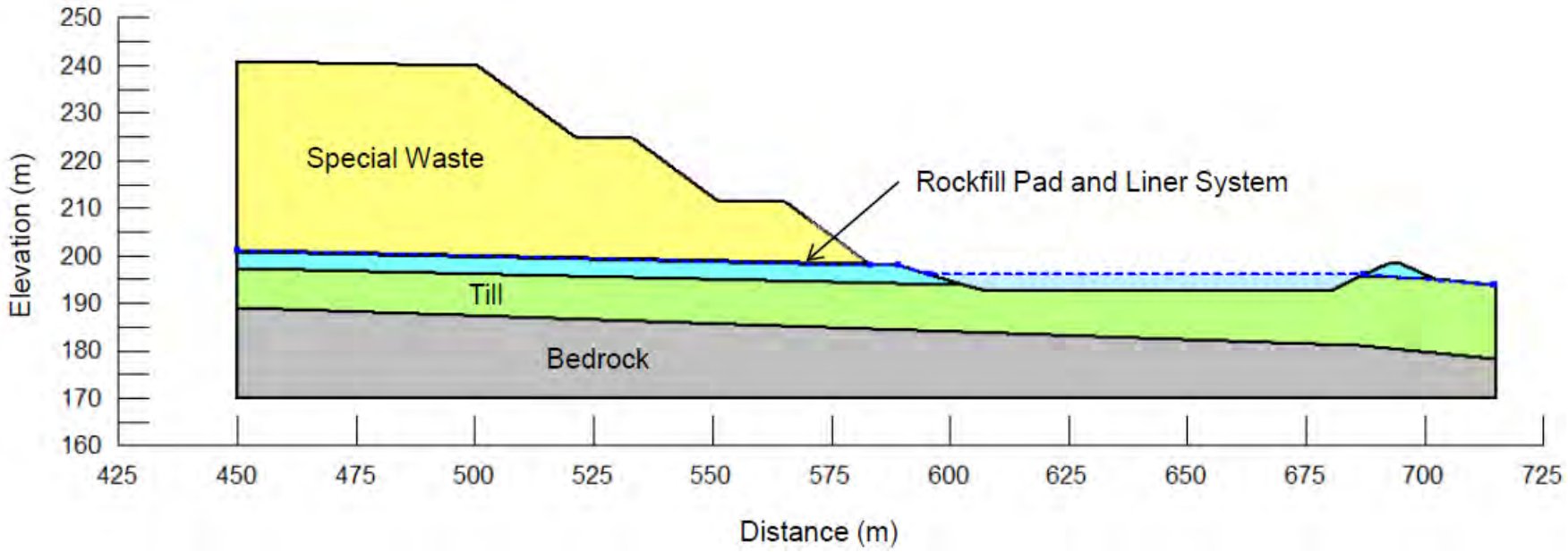
Figure 6.1-3



Areva Resources Canada - Kiggavik Project		
Classification of Rock Type		
EcoMetrix INCORPORATED	June 2011	**Figure 6.1-4**

AREVA



Material	Condition	Unit Weight (kN/m^3)	Friction Angle (degrees)	Cohesion (kPa)	
Ore / Special Waste	unsaturated	20	38	0	
Rockfill Pad	saturated	23	38	0	
Rockfill Pad	unsaturated	20	38	0	
Liner System		15	17	0	
Till	saturated	22	32	0	
Bedrock	Impenetrable				

Golder Associates

Technical Appendix 5F
Mine Rock Characterization and Assessment
December 2011

Figure 8.2-1
Stability analysis section

Kiggavik Project

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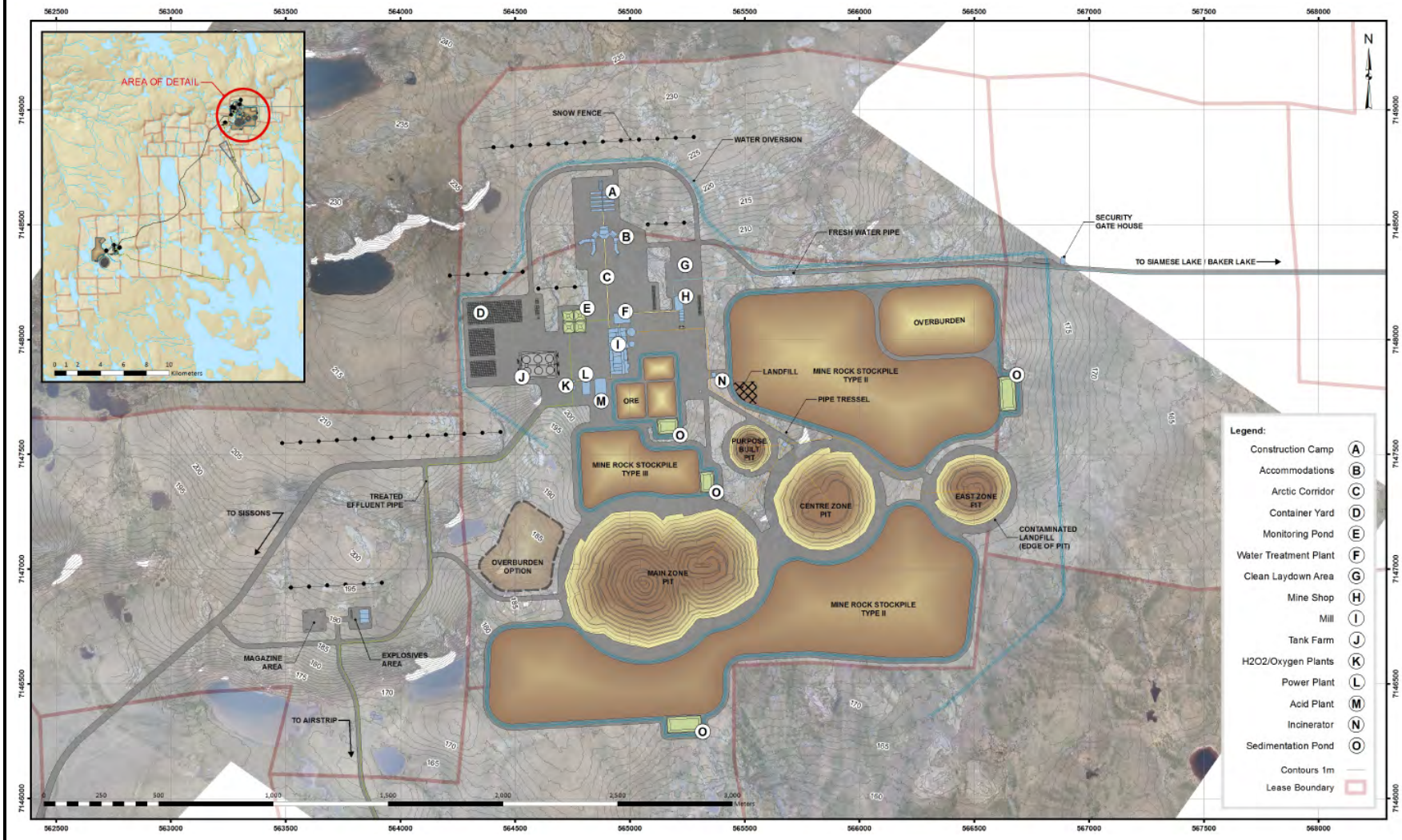

Technical Appendix 5F
Mine Rock Characterization and Assessment
December 2011

Figure 8.3-1
Kiggavik general site layout

Kiggavik Project

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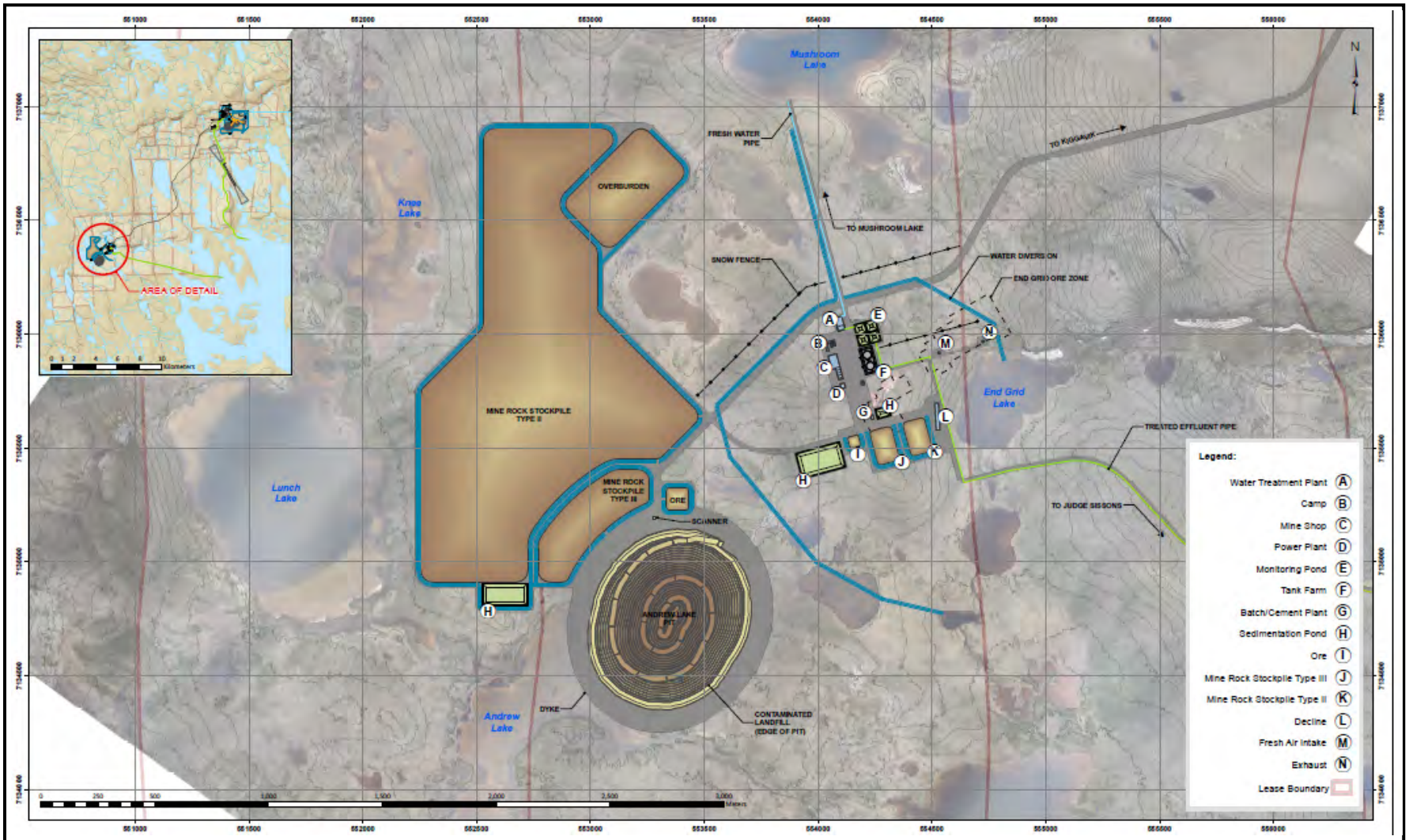
Areva Resources Canada Inc.- P.O Box 9204 – 817 – 45th Street W – Saskatoon – S7K 3X5



Technical Appendix 5F
Mine Rock Characterization and Assessment
December 2011

Figure 8.3-2
Sissons general site layout

Kiggavik Project

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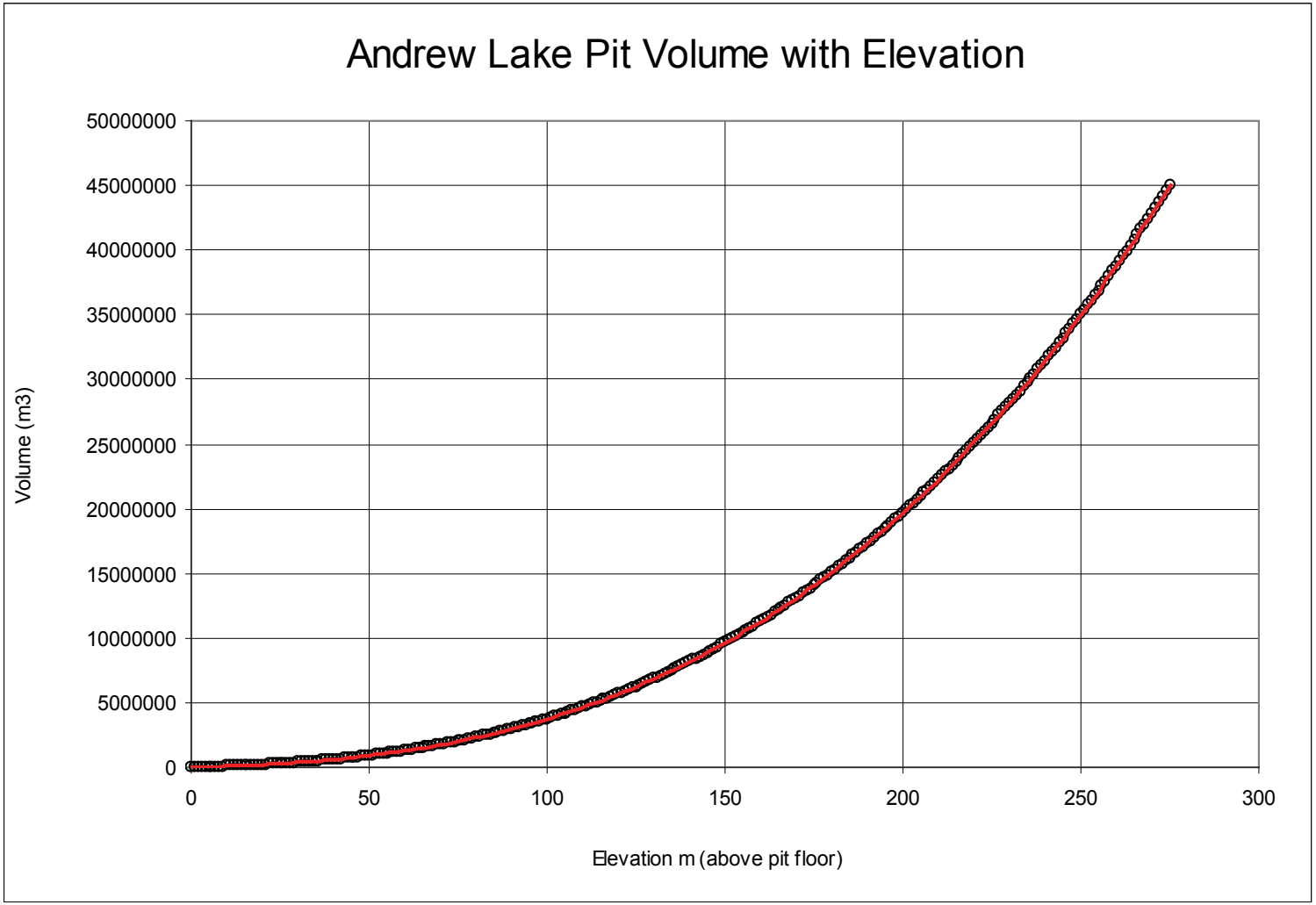
Areva Resources Canada Inc.- P.O Box 9204 – 817 – 45th Street W – Saskatoon – S7K 3X5



Areva Resources Canada - Kiggavik Project

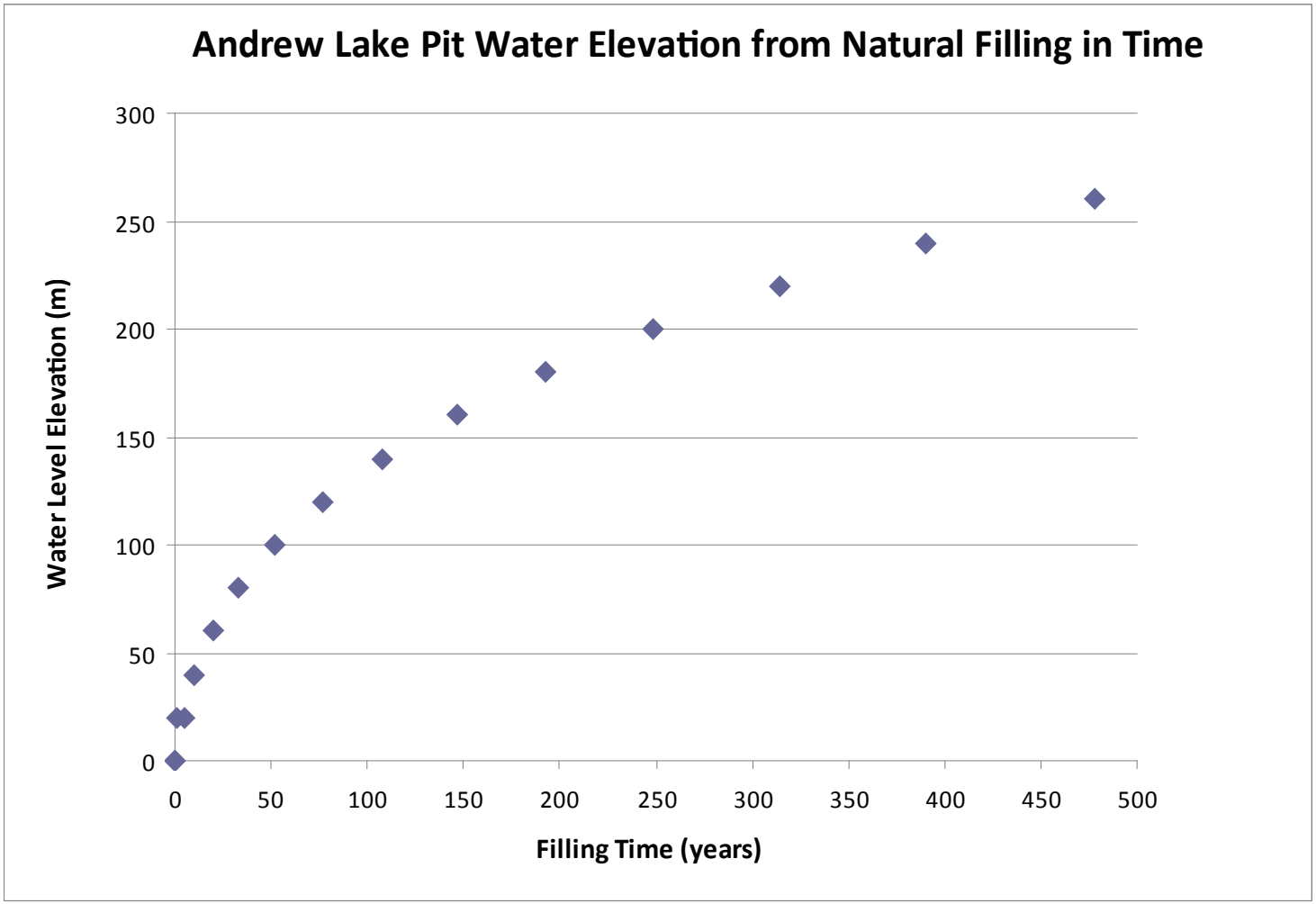
Andrew Lake Pit Volume with Elevation

AREVA

EcoMetrix INCORPORATED

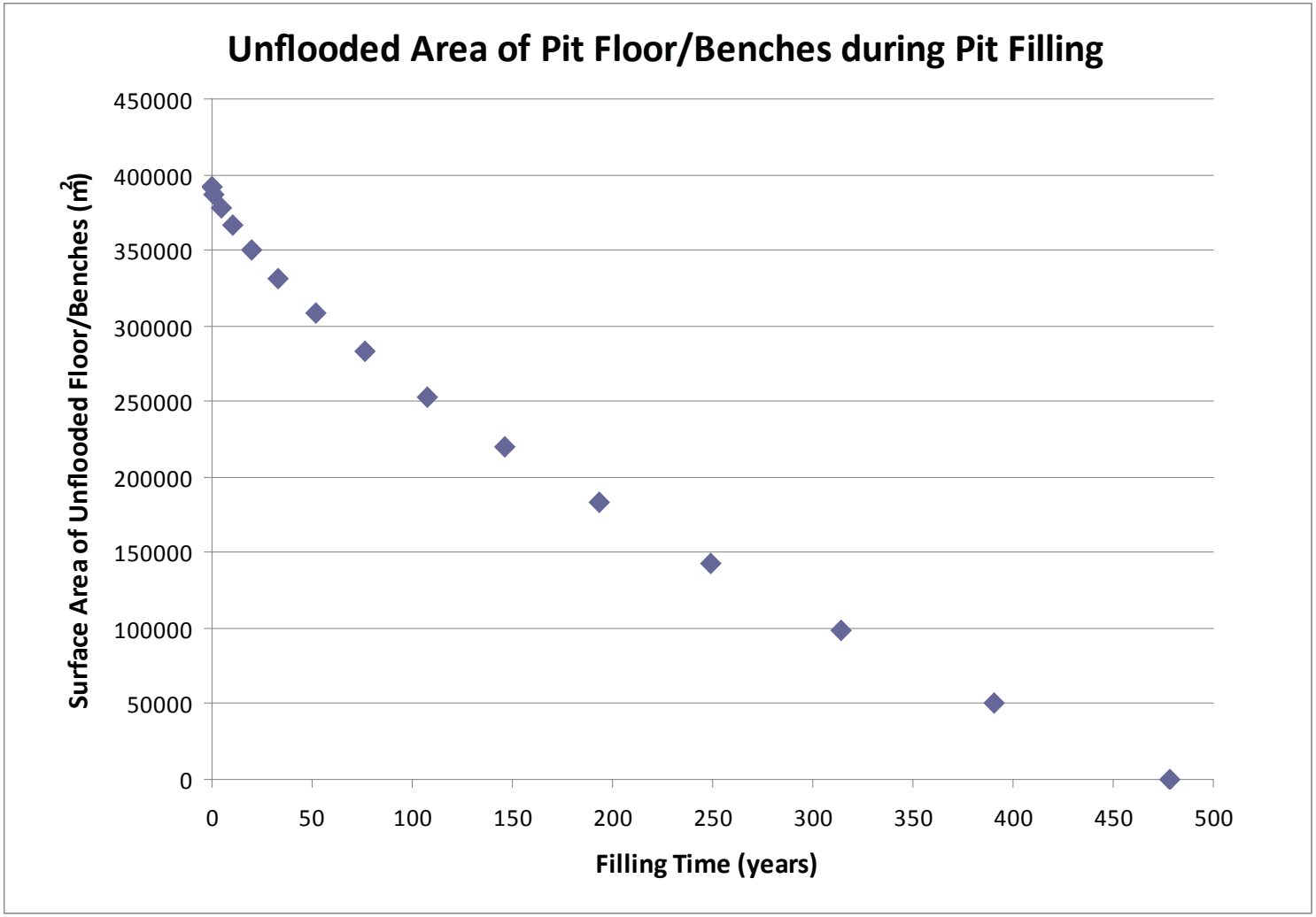
June 2011

Figure 10.1-1



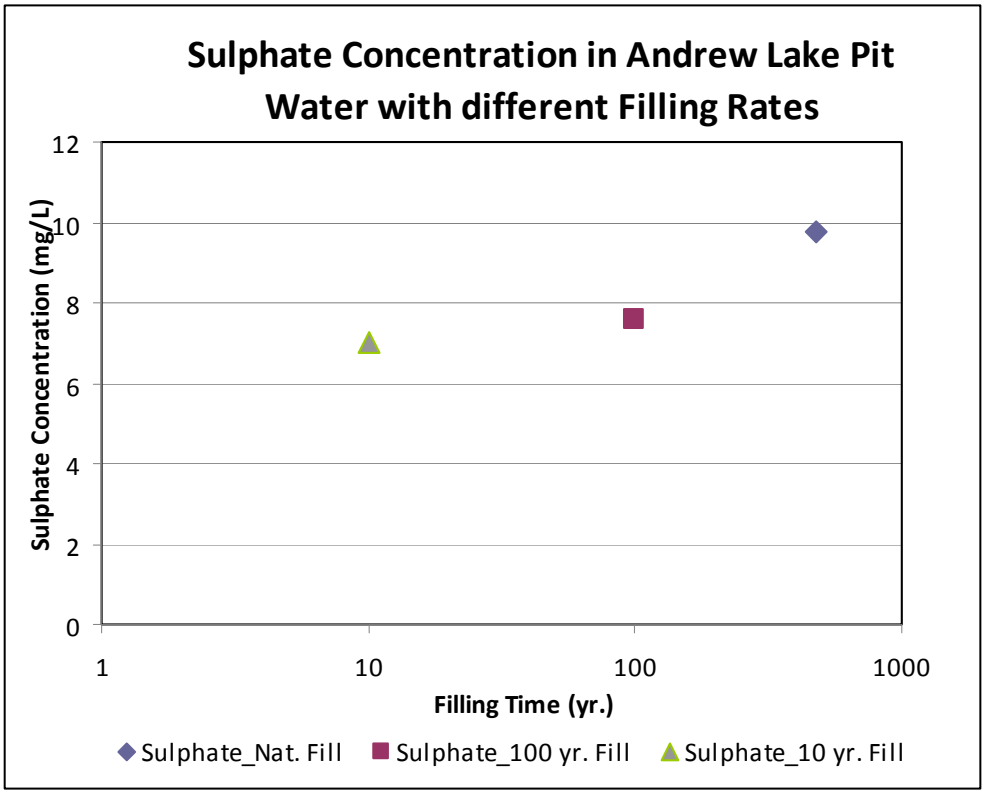
Areva Resources Canada - Kiggavik Project		
Andrew Lake Pit Water Elevation from Natural Filling		
EcoMetrix INCORPORATED	June 2011	**Figure 10.1-2**

AREVA



Areva Resources Canada - Kiggavik Project		
Unflooded Areas of Pit Floor and Benches During Filling		
EcoMetrix INCORPORATED	June 2011	**Figure 10.1-3**

AREVA



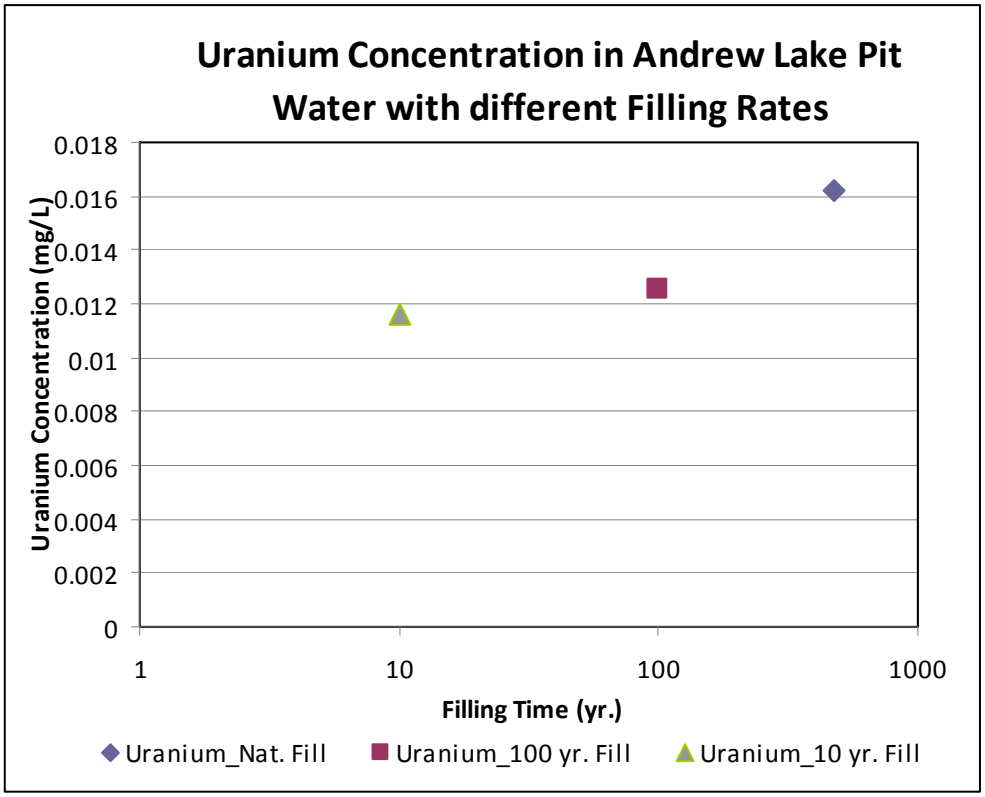


Figure 10.2-1
Sulphate and uranium content in Andrew Lake pit waters with different filling rate

14 ATTACHMENTS

ATTACHMENT A – FIELD CELL CORE SAMPLE LIST

Table A1 – Field cell waste rock sample list.

Andrew Lake Core Sample	Rock Type #	Mass in Field Cell (kg)	Centre Zone Core Sample	Rock Type #	Mass in Field Cell (kg)	End Zone Core Sample	Rock Type #	Mass in Field Cell (kg)	Main Zone Core Sample	Rock Type #	Mass in Field Cell (kg)
ANDW07-01 (17-18.16)	1	1.80	CZ07-01 (13-14)	1	2.00	END07-01 (98-98.5)	1	1.10	MZ07-01 (13-13.5)	1	0.80
ANDW07-01 (51.5-53)	1	1.60	CZ07-01 (20-21)	2	3.15	END07-01 (253.45-254)	3	1.80	MZ07-01 (26-26.6)	3	0.90
ANDW07-01 (75.9-76.9)	1	2.60	CZ07-01 (49-50)	2	2.10	END08-01 (11.38-12)	1	3.60	MZ07-01 (164-164.43)	3	0.85
ANDW07-01 (91-92)	1	2.45	CZ07-01 (71.16-72.04)	3	1.45	END08-01 (59.4-60)	1	2.30	MZ07-01 (209-209.56)	1	1.25
ANDW07-02 (31-31.96)	1	2.45	CZ07-01 (106-107)	1	3.25	END08-01 (86.23-87)	1	3.65	MZ07-04 (7-7.5)	3	0.60
ANDW07-02 (44-44.7)	1	1.20	CZ07-02 (26-29)	1	1.05	END08-01 (141-141.55)	1	2.90	MZ07-04 (93.72-94.2)	1	1.35
ANDW08-01 (17.5-18)	1	2.15	CZ07-02 (44-44.95)	1	1.70	END08-01 (176.4-177)	1	3.10	MZ08-03 (10.48-11)	3	1.70
ANDW08-01 (28.6-29.1)	1	1.90	CZ07-02 (48.95-49.95)	1	2.40	END08-02 (15-15.47)	1	1.15	MZ08-03 (24-24.25)	3	2.25
ANDW08-01 (49.1-49.6)	1	1.75	CZ07-02 (95-95.85)	1	2.65	END08-02 (35.5-36)	1	1.20	MZ08-04 (151-151.5)	3	3.05
ANDW08-01 (72-72.5)	1	2.40	CZ07-02 (101-102.05)	1	3.05	END08-02 (131.5-132)	1	1.10	MZ08-04 (166.5-167.02)	2	2.40
ANDW08-04 (36.5-37)	1	1.15	CZ08-01 (99-100)	1	3.05	END08-02 (190.9-192)	1	3.80	MZ08-04 (211.5-211.84)	3	1.60
ANDW08-04 (69-69.5)	1	2.25	CZ08-01 (138-139)	3	2.45	END08-02 (249-249.5)	1	1.40	MZ08-04 (251.05-251.55)	3	2.30
ANDW08-04 (95-95.75)	2	3.00	CZ08-01 (171-172)	3	3.10	END08-03 (16.5-17)	1	2.25	MZ08-05 (15-15.5)	3	1.55
ANDW08-05 (13-13.5)	1	1.35	CZ08-01 (183-183.9)	3	2.85	END08-03 (21-21.5)	1	3.05	MZ08-05 (129-129.5)	3	2.90
ANDW08-05 (29.5-30)	1	1.50	CZ08-01 (193.92-195)	3	3.55	END08-03 (23.5-24)	1	2.80	MZ08-06 (9-9.5)	3	1.25
ANDW08-05 (69-69.4)	1	0.80	CZ09-01 (19-20)	1	1.70	END08-03 (29.5-30)	1	1.25	MZ08-06 (72-72.3)	3	1.25
ANDW08-05 (116.55-117)	3	0.95	CZ09-01 (60-61)	3	1.70	END08-03 (46.5-47)	1	2.05	MZ09-01A (25-26)	3	1.55
ANDW09-01 (20-21)	1	1.50	CZ09-01 (108-109)	3	2.20				MZ09-01A (99.73-100.65)	3	1.70
ANDW09-01 (75-76)	1	1.35	CZ09-01 (159-160)	3	1.80				MZ09-01A (200-201)	3	1.65
ANDW09-01 (135-136)	3	1.50	CZ09-01 (198-199)	3	2.20				MZ09-01A (250.05-251.06)	3	1.75
ANDW09-01 (175-176)	1	1.35	CZ09-01 (239-240)	3	2.05				MZ09-02 (50.91-51.94)	3	1.85
ANDW09-01 (222-222.9)	1	1.35	CZ09-01 (267-268)	3	1.75				MZ09-02 (101-102)	3	1.75
ANDW09-01 (299-300)	1	1.45							MZ09-02 (150-151)	3	1.70
ANDW09-01 (323-324)	1	1.45							MZ09-03 (74.5-75)	3	0.40
									MZ09-03 (124.15-124.68)	1	0.60
									MZ-09 03 (174.22-174.85)	3	1.45
TOTAL		**41.25**			**51.20**			**38.50**			**40.40**

ATTACHMENT B – STATIC AND KINETIC TESTING RAW DATA

Table B1 – Andrew Lake core sample metal contents.

Parameter	Units	ANDW07-01 (17-18.16)	ANDW-07-01 (185-185.5)	ANDW-07-01 (200-200.5)	ANDW-07-01 (255-255.5)	ANDW-07-01 (50-50.5)	ANDW07-01 (51.5-53)	ANDW07-01 (75.9-76.9)	ANDW-07-01 (80-80.5)	ANDW07-01 (91-92)	ANDW-07-02 (26-26.5)	ANDW07-02 (31-31.96)	ANDW07-02 (44-44.7)	ANDW-07-02 (51-51.5)	ANDW08-01 (17.5-18)	ANDW08-01 (28.6-29.1)	ANDW08-01 (49.1-49.6)	ANDW08-01 (72-72.5)	ANDW-08-01 (215.0-215.5)
Aluminum (Al)	%	7.33	9.23	9.25	8.47	9.13	8.37	9.31	8.33	5.26	7.93	4.69	7.44	8.09	4.98	9.34	9.3	7.34	18.7
Antimony (Sb)	mg/kg	0.46	0.07	0.14	0.05	0.14	0.23	0.19	0.2	0.18	0.18	0.22	0.38	0.08	0.28	0.17	0.31	0.34	<1
Arsenic (As)	mg/kg	21.6	0.4	0.9	0.3	1.3	56.9	4.6	4.2	34.3	3.6	8.7	14.3	6.9	8.3	11	4.3	14.8	3
Barium (Ba)	mg/kg	310	110	60	40	60	70	70	100	90	150	50	250	550	120	90	60	140	101
Beryllium (Be)	mg/kg	3.91	3.4	4.43	3.09	3.22	3.49	3.32	3.4	2.13	3.43	1.72	3.25	3.25	2.52	2.86	2.34	2.24	3.4
Bismuth (Bi)	mg/kg	0.76	0.51	0.21	0.3	0.2	0.89	0.21	0.38	0.63	0.2	0.49	0.4	0.22	0.33	0.13	0.34	0.2	<1
Cadmium (Cd)	mg/kg	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1
Calcium (Ca)	%	0.18	0.15	0.23	0.26	0.13	0.15	0.14	0.13	0.35	0.17	0.06	0.22	0.11	0.06	0.05	0.06	0.08	0.16
Cerium (Ce)	mg/kg	79.9	6.82	32.6	0.69	22.2	28.4	22.5	66.1	68.8	95.1	42.4	62.9	286	60.2	171	26.1	122.5	238
Cesium (Cs)	mg/kg	7.85	4.75	2.76	3.58	5.63	7.79	7.29	5.62	3.28	5.27	0.65	7.91	2.19	3.78	3.69	2.85	4.35	
Chromium (Cr)	mg/kg	30	40	38	23	94	275	149	181	62	86	26	64	14	94	33	54	60	147
Cobalt (Co)	mg/kg	3	6.4	2	4.7	6.4	10.3	14.3	25	1.8	4.8	0.8	3.9	2.3	2.5	2.2	3	1.8	5
Copper (Cu)	mg/kg	10.7	4.5	4.5	1.9	7.9	7.8	9.3	26.4	6.4	9.1	4	3.5	1.9	8.2	4.3	5.3	3.6	18
Gallium (Ga)	mg/kg	23.9	27.9	23.4	20.4	23.1	25.3	28.6	26.3	15.9	21.6	14.05	24.2	23.4	15.65	24.7	31.4	20.9	32
Germanium (Ge)	mg/kg	0.15	<0.05	0.05	<0.05	0.08	0.16	0.15	0.16	0.14	0.11	0.1	0.13	0.26	0.17	0.21	0.1	0.15	<1
Hafnium (Hf)	mg/kg	3.2	3.7	10.1	1.3	3.8	2.7	2.4	2.4	2.7	2.9	1.6	3	9.2	2.4	3.7	3.2	4.1	5
Indium (In)	mg/kg	0.025	0.026	0.015	0.013	0.023	0.035	0.043	0.037	0.016	0.022	<0.005	0.03	0.009	0.011	0.013	0.017	0.016	
Iron (Fe)	%	2.64	1.87	2.12	0.5	6.57	6.65	4.03	6.45	2.29	4.44	2.2	1.95	0.59	7.65	3.09	0.9	1.69	1.53
Lanthanum (La)	mg/kg	41.6	3	18.4	<0.5	11.7	14.9	12.8	32.4	39.1	41.1	23.7	32.5	132	34.5	80.1	12.5	54.4	129
Lead (Pb)	mg/kg	10.2	23.6	49.7	11	7.1	4.8	4	6.7	4.1	5.2	5.2	9	14.3	9.4	5.2	2.6	6.7	7
Lithium (Li)	mg/kg	24.4	74.3	62.4	69.7	17.3	51.5	50.6	60.5	40.2	29.1	47	48.7	39.8	22.1	14.6	12.5	34	20
Magnesium (Mg)	%	0.44	1.76	1.04	1.5	0.5	0.56	0.96	1.11	0.32	0.43	0.11	0.64	0.48	0.27	0.5	0.42	0.3	1.04
Manganese (Mn)	mg/kg	97	157	64	50	70	63	54	211	75	66	35	95	17	65	51	38	45	<100
Molybdenum (Mo)	mg/kg	0.65	0.88	0.93	0.41	0.8	0.51	0.57	0.93	0.42	0.77	0.73	0.51	0.28	0.85	0.54	0.2	0.74	<1
Nickel (Ni)	mg/kg	12.2	66.9	36.2	49.5	29.2	72.5	139	347	19	17.7	4.3	55	34.4	12.1	16.4	22.5	16.9	27
Niobium (Nb)	mg/kg	5.5	8.4	11.3	3.1	7.3	3.7	4.8	5.5	5.4	8.6	3.6	10	12.7	5.1	6.1	3.8	7.8	16
Phosphorous (P)	mg/kg	520	620	720	1000	440	380	430	530	450	840	110	910	850	180	310	180	340	1500
Potassium (K)	%	3.58	3.38	3.65	3.45	3.6	3.87	4.26	3.14	2.57	3.16	2.09	3.63	3.92	2.39	4.66	4.89	3.54	6.55
Rhenium (Re)	mg/kg	<0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Rubidium (Rb)	mg/kg	237	182.5	95.6	82.7	148	181	204	125	109.5	138.5	26.9	285	113	80.1	151.5	120.5	103	
Scandium (Sc)	mg/kg	8.7	13.2	7.9	8.4	22.9	35.9	32	34.2	7	20.1	5.2	9.4	5.6	8.5	7.9	18.9	14.6	9
Selenium (Se)	mg/kg	2	<1	<1	<1	<1	1	2	1	1	<1	1	2	1	1	2	2	2	<1
Silver (Ag)	mg/kg	0.08	0.28	0.76	0.14	0.11	0.09	0.06	0.08	0.05	0.08	0.05	0.04	<0.01	0.12	0.05	0.05	0.06	<0.2
Sodium (Na)	%	0.03	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.03	0.02	0.02	0.01	0.02	0.02	0.03
Strontium (Sr)	mg/kg	136.5	19	45.7	18	31.8	39	31	67.1	59.3	109	69.7	109	388	107	252	50.5	118.5	244
Sulphur (S)	%	0.03	<0.01	0.01	0.04	<0.01	0.02	<0.01	<0.01	0.04	<0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	177
Tantalum (Ta)	mg/kg	0.36	0.61	0.68	0.11	0.57	0.23	0.33	0.37	0.46	1.25	0.31	0.71	0.76	0.61	0.45	0.25	0.63	<1
Tellurium (Te)	mg/kg	0.05	0.15	0.24	0.14	<0.05	0.05	0.07	0.06	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Thallium (Tl)	mg/kg	1.92	1.3	0.29	0.31	0.9	1.12	1.56	0.8	0.8	0.75	0.06	2.27	0.78	0.49	1.04	0.94	0.71	
Thorium (Th)	mg/kg	8.7	10.6	40.8	1.8	8.3	2.8	4.1	5.1	10.4	10	6	11.5	38.3	7.1	13.9	4.9	15.8	44
Tin (Sn)	mg/kg	0.9	1.5	3.1	0.7	1.1	0.9	1.2	1.4	1	3.1	1	1.3	1.6	2.1	1.2	1.3	1.2	<1
Titanium (Ti)	%	0.226	0.323	0.216	0.304	0.352	0.47	0.572	0.58	0.163	0.394	0.149	0.402	0.222	0.195	0.204	0.312	0.245	0.48
Tungsten (W)	mg/kg	3.4	2.3	9.3	1	2.7	3.1	2.7	4.1	4.7	3.1	4.9	3.2	0.8	8.8	3.5	2.8	2.7	2
Uranium (U)	mg/kg	3.9	268	253	33.4	3.9	5.2	4.1	8.5	7.5	7.2	2.8	37.5	43.9	5.3	3.2	3.8	10	19
Vanadium (V)	mg/kg	47	121	326	340	87	126	130	79	35	60	15	56	27	38	35	37	48	48
Yttrium (Y)	mg/kg	7.7	9.3	15.6	3	9.3	8.5	10.2	15.6	7	7.8	2.9	10.6	24.9	9.4	4.3	7.7	17.2	25
Zinc (Zn)	mg/kg	21	24	16	16	9	9	15	130	8	12	<2	10	9	5	9	12	4	76
Zirconium (Zr)	mg/kg	107	120.5	326	47.6	129.5	89.4	83.7	84.8	86.6	91.1	55.3	111.5	307	80.7	123.5	110.5	143	255

Table B2 – Andrew Lake core sample metal contents continued.

Parameter	Units	ANDW-08-01 (25.0-25.5)	ANDW-08-01 (50.0-50.5)	ANDW-08-01 (75.0-75.5)	ANDW-08-01-007 (214.75-215.0)	ANDW-08-01-008 (249.0-249.2)	ANDW-08-03 (110.0-110.5)	ANDW-08-03 (190.0-190.5)	ANDW-08-03 (30.0-30.5)	ANDW-08-03 (60.0-60.5)	ANDW-08-03 (80.0-80.5)	ANDW-08-03-002 (61.0-61.2)	ANDW-08-03-004 (124.60-124.80)	ANDW-08-03-007 (202.46-202.71)	ANDW08-04 (36.5-37)	ANDW08-04 (69-69.5)	ANDW08-04 (95-95.75)	ANDW-08-04 40.0-40.5	ANDW-08-04 60.0-60.5
Aluminum (Al)	%	23.8	17.8	12.6	12.2	17.4	15.9	13.2	26.8	7.52	14.2	6.95	15.7	11.9	9.64	8.98	8.48	17.9	9.08
Antimony (Sb)	mg/kg	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	<1	<1	<1	0.4	0.2	0.3	<1	<1
Arsenic (As)	mg/kg	7	2	1	1	2	1	<1	1	1	<1	1	1	1	6.2	9.3	2	2	1
Barium (Ba)	mg/kg	462	79	81	72	1310	329	71	91	51	52	39	128	67	90	80	40	97	74
Beryllium (Be)	mg/kg	6.7	2.5	2.2	2	1.2	4.6	1.8	5.2	2.3	7.4	2.1	3.2	1.8	4.26	3.17	4.34	4.1	2.2
Bismuth (Bi)	mg/kg	<1	<1	<1	<1	3	<1	<1	<1	<1	4	<1	<1	1	0.45	0.3	0.63	<1	<1
Cadmium (Cd)	mg/kg	1	1	<1	<1	1	<1	1	1	<1	<1	<1	1	<1	0.02	<0.02	0.04	<1	<1
Calcium (Ca)	%	2.75	0.12	0.11	0.09	4.08	0.15	0.11	0.18	0.13	0.25	0.14	0.14	0.09	0.17	0.06	0.25	0.42	0.08
Cerium (Ce)	mg/kg	299	57	91	186	50	63	133	134	60	30	40	86	78	69.6	121	5.07	96	30
Cesium (Cs)	mg/kg														7.44	5.06	5.58		
Chromium (Cr)	mg/kg	123	175	206	133	68	143	100	62	165	1540	270	122	102	198	198	277	302	366
Cobalt (Co)	mg/kg	5	3	2	2	13	5	2	6	4	19	4	2	2	30.5	7.4	23	13	4
Copper (Cu)	mg/kg	18	9	15	3	18	116	20	17	10	14	7	6	3	30.8	21.5	12.1	27	23
Gallium (Ga)	mg/kg	40	25	15	16	24	27	16	38	14	40	13	23	14	29.7	32.3	25.5	30	17
Germanium (Ge)	mg/kg	<1	<1	<1	<1	1	<1	<1	<1	<1	1	<1	<1	<1	0.21	0.23	0.17	<1	<1
Hafnium (Hf)	mg/kg	4	3	2	3	<1	2	3	4	1	<1	1	2	3	3.4	3	1.6	2	1
Indium (In)	mg/kg														0.085	0.037	0.081		
Iron (Fe)	%	8.86	1.66	3.28	0.87	5.79	6.22	0.67	13.2	0.57	20.1	0.6	0.79	0.67	6.33	6.39	8.04	8.26	4.77
Lanthanum (La)	mg/kg	200	30	51	102	29	39	51	73	34	15	22	53	45	19.1	53.7	2.6	38	23
Lead (Pb)	mg/kg	16	6	9	3	11	12	4	26	6	39	3	5	19	12.9	5.1	8.5	13	7
Lithium (Li)	mg/kg	13	22	39	27	36	23	25	9	28	8	34	43	58	48.5	19.3	55.2	41	50
Magnesium (Mg)	%	1.54	0.9	0.54	0.48	2.41	0.77	0.53	0.97	0.46	1.28	0.4	0.9	0.66	1.19	0.5	1.56	1.51	0.47
Manganese (Mn)	mg/kg	200	<100	<100	<100	800	<100	<100	100	<100	500	<100	<100	<100	141	226	99	200	200
Molybdenum (Mo)	mg/kg	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.53	0.67	1.29	<1	<1
Nickel (Ni)	mg/kg	22	22	22	13	7	29	13	47	25	418	17	22	15	219	36.2	177	67	30
Niobium (Nb)	mg/kg	4	<1	2	6	<1	1	<1	<1	<1	<1	<1	2	5	5.2	6.4	4.4	<1	<1
Phosphorous (P)	mg/kg	20500	1000	1000	1000	2800	900	700	1900	1000	2000	900	600	500	620	190	490	3400	700
Potassium (K)	%	8.78	6.06	3.94	3.86	3.65	5.14	4.1	8.79	2.44	5.21	2.24	5.03	3.85	4.23	4.27	3.22	5.68	2.86
Rhenium (Re)	mg/kg														<0.002	<0.002	<0.002		
Rubidium (Rb)	mg/kg														198	216	62.7		
Scandium (Sc)	mg/kg	15	16	14	3	11	13	3	13	6	41	8	8	8	46.8	35.1	33.7	43	14
Selenium (Se)	mg/kg	<1	<1	<1	<1	<1	<1	<1	1	<1	6	<1	<1	<1	2	1	1	<1	1
Silver (Ag)	mg/kg	<0.2	0.3	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.4	<0.2	<0.2	<0.2	0.08	0.06	0.05	0.5	<0.2
Sodium (Na)	%	0.04	0.02	0.02	0.02	3.8	0.06	0.03	0.04	0.02	0.01	0.02	0.04	0.02	0.01	0.02	0.02	0.02	0.02
Strontium (Sr)	mg/kg	442	92	100	203	906	94	247	381	96	34	55	145	127	70.2	108	20.9	99	40
Sulphur (S)	%	498	412	36	40	375	459	60	16	178	15	161	534	94	0.01	<0.01	0.01	162	17
Tantalum (Ta)	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	0.36	0.42	0.29	<1	<1
Tellurium (Te)	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.07	0.05	<0.05	<1	<1
Thallium (Tl)	mg/kg														1.46	1.69	0.29		
Thorium (Th)	mg/kg	22	7	12	21	3	10	15	15	6	1	5	14	21	4.4	6.1	0.8	6	4
Tin (Sn)	mg/kg	<1	<1	1	<1	2	3	2	9	<1	16	<1	<1	<1	1.4	1.4	2.2	<1	3
Titanium (Ti)	%	1.31	0.73	0.44	0.24	0.62	0.47	0.28	0.74	0.26	0.71	0.46	0.38	0.41	0.617	0.645	0.795	1.52	0.49
Tungsten (W)	mg/kg	19	5	4	2	<1	5	3	14	2	26	3	2	2	5.4	5.2	5.4	8	6
Uranium (U)	mg/kg	15	19	19	18	<2	34	9	55	27	10	9	33	208	12.4	7.8	58.9	27	25
Vanadium (V)	mg/kg	97	46	46	23	100	54	17	69	23	82	27	98	50	140	106	122	122	43
Yttrium (Y)	mg/kg	32	15	18	20	16	10	4	19	7	17	9	10	18	13	14.5	7.5	27	15
Zinc (Zn)	mg/kg	37	15	11	23	85	18	12	30	9	76	9	11	8	151	14	11	37	15
Zirconium (Zr)	mg/kg	215	142	133	123	18	125	131	203	57	59	45	117	156	107.5	100	49.2	127	73

Table B3 – Andrew Lake core sample metal contents continued.

Parameter	Units	ANDW-08-04-005 (203.3-203.5)	ANDW-08-04-006 (227.50-227.78)	ANDW-08-04-007 (265.6-265.80)	ANDW08-05 (116.55-117)	ANDW08-05 (13- 13.5)	ANDW08-05 (29.5-30)	ANDW08-05 (69- 69.4)	ANDW-08-05-010 (318.64-318.90)	ANDW09-01 (135-136)	ANDW09-01 (175-176)	ANDW09-01 (20- 21)	ANDW09-01 (222-222.9)	ANDW09-01 (299-300)	ANDW09-01 (323-324)	ANDW09-01 (75- 76)
Aluminum (Al)	%	11.9	16.6	11.7	4.86	7.44	6.47	10.25	15	9.55	11.2	8.37	5.7	8.08	8.36	8.42
Antimony (Sb)	mg/kg	<1	<1	<1	0.05	0.1	0.08	0.09	<1	0.25	0.27	0.27	0.05	0.15	0.08	0.12
Arsenic (As)	mg/kg	1	1	1	7	5	10.4	3.9	<1	37.9	11.1	4.2	4.4	1.4	1.3	6.1
Barium (Ba)	mg/kg	98	71	54	80	90	70	80	486	110	70	120	40	70	570	60
Beryllium (Be)	mg/kg	11.6	5.5	2.4	3	4.22	3.12	3.69	2.4	3.85	5.18	3.91	2.37	2.81	1.95	3.38
Bismuth (Bi)	mg/kg	<1	<1	<1	1.47	0.78	0.28	0.1	<1	2.09	0.14	0.85	1.23	0.21	0.46	0.43
Cadmium (Cd)	mg/kg	<1	1	<1	0.02	<0.02	<0.02	<0.02	1	<0.02	<0.02	0.02	<0.02	0.02	0.02	<0.02
Calcium (Ca)	%	0.17	0.38	0.17	0.1	0.05	0.04	0.05	0.21	0.07	0.11	0.95	0.07	0.34	0.18	0.19
Cerium (Ce)	mg/kg	6	3	157	39.3	405	93.1	225	3	>500	201	71.7	123.5	31.8	50.8	63.1
Cesium (Cs)	mg/kg				2.25	0.95	0.68	2.8		1.46	3.19	3.8	1.85	5.68	5.18	3.5
Chromium (Cr)	mg/kg	73	108	107	19	18	11	10	80	132	30	307	17	58	60	109
Cobalt (Co)	mg/kg	3	2	3	1.3	1.1	0.3	0.8	1	2.2	5.6	1.9	1.6	4	2.9	7.4
Copper (Cu)	mg/kg	2	14	4	2	2.3	1.2	1	1	3.5	1.2	2.4	4.1	3.2	16.8	6.4
Gallium (Ga)	mg/kg	16	25	18	15.05	24.4	16.85	30.9	18	33.8	40.3	20.5	20.6	24.8	25.4	22.4
Germanium (Ge)	mg/kg	<1	<1	<1	0.08	0.2	0.13	0.18	<1	0.93	0.25	0.2	0.1	0.12	0.14	0.16
Hafnium (Hf)	mg/kg	6	3	3	6.4	9.8	8.1	15.8	2	21.2	15.8	17.9	7.6	1.3	3.2	2.4
Indium (In)	mg/kg				0.01	0.015	<0.005	0.016		0.018	0.014	0.019	0.011	0.021	0.042	0.031
Iron (Fe)	%	0.51	2.8	0.84	0.52	1.14	1.37	0.74	1.07	4.27	4.78	3.92	0.56	2.56	2.52	4.1
Lanthanum (La)	mg/kg	3	3	75	17.6	118	85.3	97.9	<1	640	90.8	36.9	70.8	15.2	24.3	23.6
Lead (Pb)	mg/kg	44	37	4	4.4	26.2	9.9	8.6	24	20.9	6	16.5	5.3	4.8	35.2	6.9
Lithium (Li)	mg/kg	59	121	32	49	45	35.6	37	36	34.2	52.1	68.5	29.7	40.7	19.8	55.4
Magnesium (Mg)	%	1.22	2.56	0.43	0.33	0.17	0.13	0.56	1.61	0.45	0.74	0.95	0.15	0.96	0.66	0.79
Manganese (Mn)	mg/kg	<100	<100	<100	43	26	20	12	<100	21	39	24	75	31	40	65
Molybdenum (Mo)	mg/kg	<1	<1	1	0.25	0.39	0.42	0.21	<1	1.41	2.47	1.21	0.24	0.25	0.36	0.76
Nickel (Ni)	mg/kg	20	98	7	15.7	7.7	4	12.8	22	16.8	29.3	63.8	6.4	47.7	19.9	78.5
Niobium (Nb)	mg/kg	22	13	8	6.4	15.4	9.4	20.2	11	24.7	18.3	22.1	10.5	3.1	6	4.7
Phosphorous (P)	mg/kg	600	2300	1400	300	630	220	490	800	2080	530	4670	250	1210	540	950
Potassium (K)	%	3.94	4.55	3.81	1.57	3.38	2.96	5.64	7.13	4.53	6.05	3.97	2.55	3.55	3.8	3.81
Rhenium (Re)	mg/kg				<0.002	<0.002	<0.002	<0.002		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Rubidium (Rb)	mg/kg				44	55	41.2	74		67	95.4	95.8	88.3	141	164	94.5
Scandium (Sc)	mg/kg	4	10	4	1.3	3.1	1.5	4.8	4	18.8	7.3	18.2	1.7	9	9.2	16.1
Selenium (Se)	mg/kg	<1	<1	<1	1	2	2	2	<1	2	2	2	2	1	1	1
Silver (Ag)	mg/kg	1.1	0.8	<0.2	0.25	0.18	0.04	0.05	0.2	0.14	0.11	0.08	0.45	0.04	0.06	0.05
Sodium (Na)	%	0.03	0.03	0.02	0.01	0.01	0.01	0.01	0.12	0.01	0.01	0.01	0.01	0.01	0.07	0.01
Strontium (Sr)	mg/kg	34	93	132	58.7	495	143.5	317	64	1480	329	244	147.5	42.9	33.2	80.7
Sulphur (S)	%	591	138	252	<0.01	0.02	0.01	0.01	66	0.11	0.01	<0.01	0.03	0.01	0.01	<0.01
Tantalum (Ta)	mg/kg	<1	<1	<1	0.51	0.99	0.66	1.46	<1	1.28	1.53	1.1	0.93	0.14	0.51	0.31
Tellurium (Te)	mg/kg	<1	<1	<1	0.07	0.14	<0.05	<0.05	<1	0.48	<0.05	0.13	0.07	<0.05	0.12	<0.05
Thallium (Tl)	mg/kg				0.2	0.17	0.08	0.15		0.18	0.37	0.54	0.45	0.63	0.65	0.46
Thorium (Th)	mg/kg	34	24	28	42.3	70.4	57	93.6	19	78.8	76	27.8	51.6	3.2	8.8	8.9
Tin (Sn)	mg/kg	<1	2	1	1.3	2.4	2.6	1.5	1	3.8	3.3	4.7	3.3	1	1.2	2.2
Titanium (Ti)	%	0.23	0.61	0.32	0.096	0.17	0.07	0.151	0.19	0.676	0.103	0.806	0.061	0.283	0.227	0.267
Tungsten (W)	mg/kg	1	2	1	1	3.4	3.2	1.5	3	6.1	14.8	10.6	0.7	1.7	2.2	2.5
Uranium (U)	mg/kg	231	452	15	254	13	6.2	23.3	87	15.5	8.8	21.4	7	7.3	4.2	5.1
Vanadium (V)	mg/kg	510	193	20	17	21	10	16	146	36	17	55	6	37	49	50
Yttrium (Y)	mg/kg	30	9	12	11	14.4	13.9	28	9	74.7	17.8	71.1	10.2	25.5	6.3	5.1
Zinc (Zn)	mg/kg	14	15	14	4	8	<2	3	12	<2	6	5	7	26	20	9
Zirconium (Zr)	mg/kg	238	127	160	227	327	256	480	102	>500	428	>500	207	53	108	83.5

Table B4 – Center Zone core sample metal contents.

Parameter	Units	CZ07-01 (106-107)	CZ07-01 (13-14)	CZ07-01 (20-21)	CZ07-01 (49-50)	CZ07-01 (71.16-72.04)	CZ07-02 (101-102.05)	CZ07-02 (26-29)	CZ07-02 (44-44.95)	CZ07-02 (48.95-49.95)	CZ07-02 (95-95.85)	CZ08-01 (138-139)	CZ08-01 (171-172)	CZ08-01 (183-183.9)	CZ08-01 (193.92-195)	CZ08-01 (99-100)	CZ09-01 (108-109)	CZ09-01 (159-160)	CZ09-01 (19-20)	CZ09-01 (198-199)	CZ09-01 (239-240)	CZ09-01 (267-268)	CZ09-01 (60-61)
Aluminum (Al)	%	7.45	7.95	8.31	7.79	2.9	7.42	7.23	11.1	9.28	7.49	7.41	6.85	7.55	6.75	6.81	7.28	7.18	7.8	6.84	6.41	7.06	8.57
Antimony (Sb)	mg/kg	0.09	0.2	0.19	0.18	0.43	0.06	0.13	0.09	0.08	0.06	0.07	0.11	0.15	0.13	0.05	0.09	0.06	0.09	0.07	0.05	0.08	0.14
Arsenic (As)	mg/kg	3.2	3.1	6.3	3.6	12.5	1.2	1.5	2.8	1.1	1	1.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.1	0.6	0.8	3.3
Barium (Ba)	mg/kg	280	200	430	920	180	980	830	40	230	400	1040	680	450	950	940	910	760	660	820	1130	950	950
Beryllium (Be)	mg/kg	3.87	5.86	3.48	3.07	4.12	3.34	2.59	5.84	4.02	4.67	3.89	5.36	76	15.1	6.6	2.45	3.48	2.29	5.03	6.29	4.93	10.5
Bismuth (Bi)	mg/kg	0.44	1.26	2.52	1.76	4.54	0.23	0.38	0.18	0.34	0.9	0.52	1.05	8.19	2.4	0.95	0.55	0.4	0.08	0.75	0.33	0.63	1.49
Cadmium (Cd)	mg/kg	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.1	<0.02	<0.02	0.43	0.08	<0.02	<0.02
Calcium (Ca)	%	0.16	0.18	0.17	0.11	0.04	0.16	0.2	0.37	0.22	0.17	0.33	1.56	2.11	0.74	0.15	1.37	1.4	0.09	1.51	0.72	1.72	0.17
Cerium (Ce)	mg/kg	5.24	32.6	4.78	36.1	30.6	48.1	9.42	206	51.6	19.35	36.7	58.9	50	92.5	48.3	58.8	63.5	40.2	57	93.6	56.8	19.45
Cesium (Cs)	mg/kg	11.65	15.5	7.24	8.44	5.92	8.53	12.4	2.41	6.95	8.3	8.24	17.85	56.3	13.4	26.8	7.5	12.5	6.1	11.8	3.53	10.15	46.3
Chromium (Cr)	mg/kg	55	61	61	63	51	49	40	98	66	81	56	49	42	54	59	49	46	9	40	27	62	60
Cobalt (Co)	mg/kg	8.8	6.8	4.1	3.5	3	15.8	2.3	35.5	21.6	44.5	18	11.7	12.1	13.6	14.1	11.4	13.7	4.9	14.4	3.7	21.2	50.9
Copper (Cu)	mg/kg	9.9	17.5	13.2	4.7	3	10.1	1.7	2.5	2.7	24.8	9.4	77.9	40.7	76.4	7	74.7	182	3.9	64.1	34	142	38.9
Gallium (Ga)	mg/kg	23.9	20.1	21.4	22.3	9.85	18.9	20.9	33.9	21.7	22.4	26.1	19.25	25.8	18.25	20.1	18.9	18.2	20.7	19.55	20.9	18.95	27.9
Germanium (Ge)	mg/kg	0.11	0.12	0.08	0.1	0.11	0.14	0.08	0.2	0.13	0.15	0.16	0.17	0.17	0.17	0.13	0.17	0.17	0.13	0.16	0.17	0.18	0.13
Hafnium (Hf)	mg/kg	3	3.7	3.9	3.1	16.8	2.6	3.1	6.1	4.1	4	2.8	2.6	1.9	2.1	2.6	2.4	2.4	3	3.1	6.7	2.5	2.6
Indium (In)	mg/kg	0.022	0.039	0.027	0.038	0.014	0.027	0.032	0.013	0.018	0.02	0.04	0.03	0.071	0.018	0.03	0.02	0.015	0.011	0.057	0.009	0.029	0.054
Iron (Fe)	%	1.87	2.98	2.95	1.4	0.91	2.73	0.95	1	1.15	2.18	4.16	2.8	3.02	2.89	1.88	2.74	2.66	2.33	2.73	1.37	3.78	3.09
Lanthanum (La)	mg/kg	2.3	17.4	1.8	19.7	10.6	23.3	4.1	99.1	22.3	8.1	14.9	29.3	25.4	53.6	23.4	29.8	32.9	21	27.6	55.2	27.2	8
Lead (Pb)	mg/kg	5.4	20.6	21	20.6	24.8	6.3	7.2	9.1	3.3	16.7	6	16.7	44.7	20.6	12.3	288	24.5	4.9	95.2	89.1	31.8	7.7
Lithium (Li)	mg/kg	59	124	43.4	25.3	19.7	65.8	17.5	221	199	66.6	70.1	59.1	150	55.1	164.5	45.9	54.9	83.8	75.1	15.7	54.2	225
Magnesium (Mg)	%	1.92	1.45	1	0.24	0.18	1.65	0.28	5.61	3.55	1.57	1.86	1.03	1.22	1.03	1.25	0.89	0.83	1.27	0.82	0.36	0.95	1.68
Manganese (Mn)	mg/kg	149	132	61	24	67	321	72	29	37	231	560	401	779	284	339	276	197	91	394	173	467	528
Molybdenum (Mo)	mg/kg	2.01	3.65	4.24	2.15	3.06	2.58	0.89	0.61	0.46	1	4.2	34.8	218	33.8	6.96	14.55	10.25	1.22	7.46	17.5	193.5	5.31
Nickel (Ni)	mg/kg	62.9	37.7	38.2	10.4	13.9	27.2	12.6	362	118	44.2	39.1	27.3	25.6	31.9	25.8	27.2	26.6	47.9	23.1	12.1	33.2	43.8
Niobium (Nb)	mg/kg	6.2	5.7	6	6	7.1	5.2	6.4	13.2	6.1	6.4	7.1	5.6	3.5	4.4	5.3	4.8	4.1	7.5	5.5	10.7	5.8	6.5
Phosphorous (P)	mg/kg	620	730	750	530	120	580	930	1590	850	660	690	590	420	600	570	540	530	240	570	620	570	600
Potassium (K)	%	3.77	3.57	4.1	3.76	1.36	5.61	3.6	2.63	4.29	4.91	5.6	2.92	4.58	3.72	4.85	2.34	2.18	3.08	2.01	3.96	3.01	5.41
Rhenium (Re)	mg/kg	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.003	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.014	<0.002
Rubidium (Rb)	mg/kg	206	236	188	180	98.9	136	216	61.8	159.5	154	156	326	880	289	377	185.5	175	115	178	242	241	540
Scandium (Sc)	mg/kg	9.7	9.2	10	14.5	5.1	8.3	9.2	10.7	8.3	9	10.9	8.3	7.6	9.2	9.7	8.4	8.5	2.9	8.2	2.2	11.3	11.6
Selenium (Se)	mg/kg	1	2	2	2	3	1	1	2	1	2	2	1	2	2	1	2	2	1	2	1	2	2
Silver (Ag)	mg/kg	0.24	0.24	0.35	1.21	0.46	0.02	0.02	0.03	0.02	0.29	0.05	0.21	1.18	0.21	0.14	0.32	0.09	0.02	0.25	0.07	0.1	0.08
Sodium (Na)	%	0.03	0.02	0.05	0.15	0.05	0.05	0.15	0.02	0.03	0.03	0.08	1.77	0.14	1.59	0.05	2.68	2.64	0.14	2.88	2.47	2.16	0.07
Strontium (Sr)	mg/kg	12.7	15.2	20.6	134	32.3	90.1	107.5	164	49.5	44.3	51.9	364	67.4	311	88.9	518	444	62.7	539	400	432	46.1
Sulphur (S)	%	0.04	<0.01	0.02	0.05	0.19	0.08	0.01	0.03	<0.01	0.05	0.55	1.13	2	1.68	0.03	0.93	0.91	0.02	0.9	0.49	1.1	0.95
Tantalum (Ta)	mg/kg	0.45	0.41	0.42	0.41	1.07	0.4	0.42	0.86	0.4	0.48	0.52	0.4	0.25	0.32	0.35	0.35	0.31	0.75	0.4	0.82	0.4	0.46
Tellurium (Te)	mg/kg	0.26	0.18	0.22	1.19	1.37	0.05	0.08	0.1	<0.05	0.07	0.1	0.14	0.68	0.45	0.36	0.14	0.06	<0.05	0.15	<0.05	0.18	0.18
Thallium (Tl)	mg/kg	2.34	1.95	1.65	1.33	1.06	1.55	1.78	0.29	1.49	1.5	2.54	3.91	8.23	3.64	3.86	2.67	2.31	0.7	2.06	2.27	2.96	6.58
Thorium (Th)	mg/kg	7.1	10.8	9.8	10.1	24.3	8.6	9.4	21.9	18.8	9.9	6.4	9.8	7.2	9	8.6	9.9	10.8	7.3	9.2	39.6	9.6	7.1
Tin (Sn)	mg/kg	1.5	1.6	1.3	1.2	1.3	0.9	1.6	3.1	1.4	2.1	1.4	1.9	7.4	1.2	6.3	1.1	1.4	1.2	1.9	1.4	1.1	5
Titanium (Ti)	%	0.275	0.247	0.278	0.26	0.135	0.235	0.237	0.484	0.241	0.293	0.303	0.235	0.194	0.209	0.222	0.219	0.208	0.067	0.223	0.135	0.257	0.274
Tungsten (W)	mg/kg	13.4	15.2	15.6	38	7	12.9	15.5	3.4	3.7	15.5	5.7	12.4	14.5	11.2	11.8	5.7	15.8	22.5	53.9	3.7	11.2	20.4
Uranium (U)	mg/kg	18.9	16.9	62	50	500	8.7	29.7	37.1	18.5	33.7	3.7	2.6	2.8	2.5	23.5	2.8	3.3	3.2	2.5	11.6	2.8	4.8
Vanadium (V)	mg/kg	102	54	125	225	20	64	69	41	40	105	86	70	96	64	90	62	67	14	60	17	77	92
Yttrium (Y)	mg/kg	6	9.3	8.3	10.9	72.1	7.8	11.5	10.6	6.7	6.9	9.2	9.7	9	9.2	6.4	9.6	9.5	6.3	10	6.9	10.3	5.4
Zinc (Zn)	mg/kg	34	85	26	30	16	54	6	11	3	122	93	47	54	38	56	62	32	9	103	30	76	77
Zirconium (Zr)	mg/kg	104	124	137	107	>500	95	105	196.5	137	137	96.1	94.8	67.1	76.8	92.9	84.8	89.4	79.1	107.5	208	88.7	92.6

Table B5 – End Grid core sample metal contents.

Parameter	Units	END07-01 (253.45-254)	END07-01 (98-98.5)	END08-01 (11.38-12)	END08-01 (141-141.55)	END08-01 (176.4-177)	END08-01 (59.4-60)	END08-01 (86.23-87)	END08-02 (131.5-132)	END08-02 (15-15.47)	END08-02 (190.9-192)	END08-02 (249-249.5)	END08-02 (35.5-36)	END-08-02-008 (240.64-240.86)	END-08-02-014 (418.22-418.43)	END08-03 (16.5-17)	END08-03 (21-21.5)	END08-03 (23.5-24)	END08-03 (29.5-30)
Aluminum (Al)	%	6.91	7.78	1.68	9.06	9.1	10.8	4.68	10.55	6.85	6.89	5	12.25	13.6	25.8	4.23	7.61	7.75	7.28
Antimony (Sb)	mg/kg	0.08	0.08	0.16	0.36	0.32	2.42	0.27	0.41	0.16	0.11	0.05	0.46	<1	<1	0.17	0.16	0.19	0.2
Arsenic (As)	mg/kg	0.9	0.6	2.1	2.6	6.4	5.8	4.4	10.7	3.7	4.8	0.5	12	<1	<1	3.4	3	3.7	5.7
Barium (Ba)	mg/kg	570	180	40	100	80	90	70	150	60	90	40	110	62	125	60	70	70	80
Beryllium (Be)	mg/kg	2.71	2.54	1.33	3.69	3.21	4.06	2.3	3.55	2.43	2.35	1.5	4.09	2.9	3.4	1.42	1.96	2.25	2.38
Bismuth (Bi)	mg/kg	1.5	0.11	0.03	0.44	0.13	0.41	0.08	0.24	0.06	0.19	0.07	0.24	<1	<1	0.06	0.09	0.06	0.07
Cadmium (Cd)	mg/kg	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<1	1	<0.02	<0.02	<0.02	<0.02
Calcium (Ca)	%	0.55	0.23	0.04	0.08	0.25	0.08	0.05	1.29	0.13	1.08	1.02	0.07	0.23	0.1	0.05	0.04	0.04	0.04
Cerium (Ce)	mg/kg	20.9	25.5	55.7	20.8	118	62.6	52.1	93.8	60.1	54.1	24	194.5	39	1	49.8	69.2	82.7	121
Cesium (Cs)	mg/kg	4.57	5.9	0.91	3.96	3.16	3.41	2.1	4.67	3.17	3.68	3.32	5.93			1.03	2.05	2.58	2.57
Chromium (Cr)	mg/kg	59	51	16	42	43	150	20	51	24	51	35	57	119	156	29	34	31	36
Cobalt (Co)	mg/kg	21.3	8.6	1.7	5.2	5.7	7.3	2.1	5.2	2.6	3.3	2.6	6.2	7	11	1.8	2.7	3	2.5
Copper (Cu)	mg/kg	15.8	2.5	4.3	15.3	11.2	8.8	5.7	10.2	6.5	3.4	2.8	12.4	3	2	6.2	9.8	9.7	8.6
Gallium (Ga)	mg/kg	25.4	22.1	5.39	32.1	26.6	39.3	16.15	31	21.6	18.8	14.5	44.5	22	28	10.1	19.8	20.2	19.4
Germanium (Ge)	mg/kg	0.17	0.13	0.09	0.14	0.21	0.34	0.1	0.23	0.11	0.16	0.1	0.28	1	<1	0.13	0.15	0.17	0.19
Hafnium (Hf)	mg/kg	2.5	3.3	0.9	4	4.2	5.4	2	4.3	2.9	2.4	1.8	4.8	2	4	1.4	2.8	2.6	3
Indium (In)	mg/kg	0.033	0.027	0.005	0.051	0.037	0.024	0.009	0.049	0.029	0.025	0.023	0.031			0.006	0.013	0.025	0.016
Iron (Fe)	%	7.31	1.83	0.46	3.87	2.53	15.6	0.61	5.71	1.07	3.53	0.69	5.63	5.82	14.6	2.41	3.53	3.35	3.01
Lanthanum (La)	mg/kg	9.8	14.3	32.9	10.9	50	27.4	29.7	40	30.9	27.3	12.6	73.6	21	2	41.5	21	29.2	60.5
Lead (Pb)	mg/kg	13.4	4.7	3	13.9	4.5	12	3	5.5	3.1	5.1	2.1	7.1	5	19	3	4.5	4.1	8.3
Lithium (Li)	mg/kg	69.3	62.5	69	4.7	21.2	8.2	33.9	9.1	17	26.9	40.1	12.2	23	105	35.4	21.9	17	19.6
Magnesium (Mg)	%	2.78	1.52	0.1	0.53	0.54	0.53	0.3	1.25	0.29	1.21	1.01	0.57	1.68	4.71	0.15	0.28	0.32	0.33
Manganese (Mn)	mg/kg	730	212	41	117	74	77	46	191	72	126	330	110	<100	100	68	69	57	56
Molybdenum (Mo)	mg/kg	12.3	2.03	0.5	0.48	0.83	2.58	0.34	0.77	0.47	0.98	0.57	0.76	<1	<1	0.56	0.74	0.67	0.62
Nickel (Ni)	mg/kg	41.4	45.4	4.8	23.3	24.2	22.1	9.8	22	11.6	39.2	17.3	22.4	49	59	4.4	10.2	10.2	11.2
Niobium (Nb)	mg/kg	5.6	7.4	1.5	6.9	7.7	9.3	4.2	11.6	5.8	6.1	4.3	8	2	8	3.4	6.5	5.9	7.2
Phosphorous (P)	mg/kg	1060	640	110	70	470	420	110	1130	190	570	350	480	1500	1000	220	170	210	290
Potassium (K)	%	2.85	3.47	0.73	4.42	4.41	5.55	2.28	6.18	3.41	3.5	2.54	6.66	4.68	7.78	1.95	3.54	3.64	3.48
Rhenium (Re)	mg/kg	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002			<0.002	<0.002	<0.002	<0.002
Rubidium (Rb)	mg/kg	109.5	177	26.5	184.5	101	112	75.9	147.5	169	145.5	107.5	181			42.8	81.1	98.7	115.5
Scandium (Sc)	mg/kg	9.9	10.8	1.7	14.1	11.9	16	5.4	19.9	8.6	10.9	6.9	17.4	7	25	5.4	10	9.7	10.6
Selenium (Se)	mg/kg	2	2	2	1	1	2	1	1	1	1	2	1	<1	<1	1	1	1	1
Silver (Ag)	mg/kg	0.13	0.05	0.28	0.06	0.04	0.1	0.1	0.05	0.03	0.03	0.01	0.04	<0.2	0.3	0.04	0.03	0.03	0.03
Sodium (Na)	%	0.02	0.03	0.01	0.03	0.03	0.02	0.01	0.03	0.03	0.02	0.02	0.03	0.03	0.05	0.01	0.02	0.01	0.01
Strontium (Sr)	mg/kg	51	25.6	62.2	53	115	206	63.4	92.3	93.6	46.8	29.3	286	43	27	130	128	183.5	226
Sulphur (S)	%	1.22	0.03	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	0.04	23	18	<0.01	<0.01	<0.01	0.01
Tantalum (Ta)	mg/kg	0.41	0.51	0.1	0.5	0.56	0.53	0.27	0.79	0.4	0.42	0.3	0.54	<1	<1	0.22	0.42	0.4	0.49
Tellurium (Te)	mg/kg	0.2	0.06	<0.05	0.05	0.07	0.09	0.07	0.09	0.05	0.07	<0.05	0.07	<1	<1	<0.05	<0.05	<0.05	0.06
Thallium (Tl)	mg/kg	1.59	0.97	0.14	1.06	0.48	0.62	0.44	1.38	1.34	0.65	0.47	2.16			0.21	0.44	0.62	0.72
Thorium (Th)	mg/kg	6.5	11.5	4.1	9.9	13.8	45.4	9.2	14.9	9.6	8.1	6.7	18.2	11	10	6.5	8.2	9.9	14.8
Tin (Sn)	mg/kg	1.1	1.2	0.3	1.5	2	2	0.9	2.9	1.1	1.2	0.7	2.5	1	5	0.6	1	0.9	1.1
Titanium (Ti)	%	0.258	0.284	0.054	0.302	0.341	0.359	0.165	0.445	0.248	0.247	0.18	0.326	0.43	1.12	0.152	0.265	0.237	0.298
Tungsten (W)	mg/kg	1.3	1.4	2.3	4.7	5	24.9	3.6	6.2	2.9	2.3	1	4.6	2	2	1.4	4.2	2.5	4.6
Uranium (U)	mg/kg	4.9	4.7	1.9	1.6	2.2	4.5	1.5	2	2.4	1.4	1.5	4.1	3	7	1.8	3.3	2.3	3.2
Vanadium (V)	mg/kg	80	71	6	41	37	81	17	70	30	61	40	69	57	262	14	23	23	29
Yttrium (Y)	mg/kg	6.8	5.9	5.5	8.6	5	32.3	6	10.2	12.4	8.3	6.1	10.8	15	6	5.4	9	6	9.1
Zinc (Zn)	mg/kg	120	27	5	17	10	11	4	21	19	<2	<2	29	20	28	3	9	10	12
Zirconium (Zr)	mg/kg	89.9	114	27.9	129	135	223	66.3	158	98	78.7	66.3	182	120	203	49.9	96.2	92.5	107.5

Table B6 – End Grid core sample metal contents continued.

Parameter	Units	END08-03 (46.5-47)	END-08-03A-0012 (341.50-341.76)	END-08-03A-002 (60.0-60.25)	END-08-03A-004 (104.50-104.72)	END-08-03A-006 (159.70-159.90)	END-08-03A-008 (220.88-221.10)	ENDG-07-01 (140-140.5)	ENDG-07-01 (20-20.5)	ENDG-07-01 (215-215.5)	ENDG-07-01 (50-50.5)	ENDG-09-01 (269.5-270)	ENDG-09-02 (238-238.45)	ENDG-09-02 (320.5-321)	ENDG-09-02 (442.1-442.6)	ENDG-09-03 (195-195.5)	ENDG-09-03 (372-372.5)	ENDG-09-04 (205.1-205.6)	ENDG-09-04 (368.4-369)	ENDG-09-05 (297-297.5)	ENDG-09-06 (233.45-234)	ENDG-09-07 (114.42-114.92)	ENDG-09-08A (261-261.5)	ENDG-09-12 (361.6-362.2)	ENDG-09-13 (172.5-173)
Aluminum (Al)	%	8.36	13.2	12	14.8	13.6	15	7.71	4.55	7.31	7.92	7.69	8.18	7.51	7.69	9.56	8.71	12.2	7.54	7.25	11.45	12	8.47	10.35	8.53
Antimony (Sb)	mg/kg	0.16	1	<1	<1	<1	<1	0.05	0.11	0.05	0.05	0.29	0.05	0.14	0.05	0.06	0.09	0.38	<0.05	0.07	0.44	0.28	0.1	0.16	0.07
Arsenic (As)	mg/kg	6.2	1	2	6	2	1	2.5	1.6	<0.2	0.6	1.3	0.4	0.5	0.6	0.6	1.5	5.8	1.6	1.5	4.3	13.6	0.9	2.3	1.6
Barium (Ba)	mg/kg	70	250	80	49	49	142	60	1000	980	880	260	50	210	810	100	100	110	650	290	700	60	70	120	50
Beryllium (Be)	mg/kg	2.98	2.6	2.6	2.6	2.5	2.3	2.02	3.24	2.06	1.81	2.45	2.2	2.18	2.32	4.32	3.58	4.97	1.11	1.18	2.31	3.31	1.93	2.53	2.46
Bismuth (Bi)	mg/kg	0.15	2	<1	<1	<1	<1	0.24	0.22	0.11	1.15	0.13	0.02	0.11	0.5	2.6	0.03	0.23	0.87	0.61	0.03	0.08	0.05	0.16	0.06
Cadmium (Cd)	mg/kg	<0.02	<1	<1	<1	<1	1	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium (Ca)	%	0.06	0.27	0.1	0.53	1.5	0.25	0.14	0.13	0.28	0.15	0.4	0.86	0.17	1.23	0.41	0.26	0.06	0.39	1.67	0.76	0.08	0.57	0.12	0.18
Cerium (Ce)	mg/kg	167.5	11	72	78	17	54	4.66	106	53.9	11.65	51	9.1	18.55	66.5	2.86	65.1	39.7	17.15	33.7	206	201	27.1	34	61.3
Cesium (Cs)	mg/kg	2.5						2.55	2.71	2.77	3.25	3.78	5.18	4.42	1.9	4.77	6.19	4.46	3.41	3.25	6.24	2.29	4.82	5.98	6.9
Chromium (Cr)	mg/kg	43	100	98	130	120	134	43	6	62	53	28	81	30	46	365	56	64	83	47	58	13	59	81	59
Cobalt (Co)	mg/kg	5.8	13	4	3	4	12	8	1.3	11.1	9.9	8.2	7.4	3.7	15.1	42.2	18.9	7.1	112.5	15.7	8.5	2.4	15.1	17.2	4.1
Copper (Cu)	mg/kg	14.9	2	30	12	3	4	3.3	16.4	18.9	31.7	11.6	1.7	3	25.9	9.9	5	14	932	5.3	8.3	3.9	6.6	8.1	2.3
Gallium (Ga)	mg/kg	20.6	17	17	20	20	22	17.15	12.45	16.3	15.95	24.8	23.5	24.1	19.5	33.6	24.4	45.7	21.1	21	37.1	28	24.9	29.4	24.5
Germanium (Ge)	mg/kg	0.2	<1	<1	<1	<1	<1	<0.05	0.19	0.06	<0.05	0.08	0.07	0.06	0.15	0.09	0.11	0.13	0.1	0.1	0.15	0.2	0.07	0.07	0.08
Hafnium (Hf)	mg/kg	3.6	4	2	2	2	2	2.6	5.2	2.6	2.9	4.2	3.6	3.3	2.6	2.3	3.5	5	3.3	2.9	5.2	10.3	3.7	5.2	3.5
Indium (In)	mg/kg	0.024						0.014	<0.005	0.025	0.014	0.028	0.023	0.025	0.032	0.03	0.034	0.033	0.028	0.037	0.139	0.023	0.029	0.028	0.029
Iron (Fe)	%	3.69	2.18	0.78	5.29	5.07	2.92	2.31	0.64	2.42	1.98	1.71	1.46	1.25	4.42	3.26	3.41	6.55	2.88	2.93	1.16	5.06	1.41	1.62	1.06
Lanthanum (La)	mg/kg	58.9	7	43	34	9	38	1.7	107.5	29.2	5.5	25.6	4.4	11.1	34.1	1.1	30.7	13.7	7	13.1	113.5	81.9	12.8	15.6	31.7
Lead (Pb)	mg/kg	4.2	38	5	8	5	6	7.4	7.7	5.9	9.1	5.8	3.5	4.6	6.7	5.2	5.5	5.7	17.1	5.7	4.7	4.6	2.5	5.7	4.6
Lithium (Li)	mg/kg	13.1	88	14	11	17	57	59.3	27	35.9	34.1	29.7	49	24.5	35.4	147	70.8	10.2	77	71.4	55.8	24.6	75.1	42.6	35.2
Magnesium (Mg)	%	0.32	2.63	0.4	0.68	1.83	2.92	1.94	0.22	1.48	1.31	0.6	1.82	0.63	1.37	3.78	2.6	0.9	2.31	2.8	1.51	0.47	1.97	1.01	1.2
Manganese (Mn)	mg/kg	71	200	<100	100	200	300	200	31	402	217	216	254	49	548	597	360	117	522	496	87	46	225	38	73
Molybdenum (Mo)	mg/kg	0.72	<1	3	<1	<1	1	0.53	0.44	0.31	2.77	0.59	0.34	0.85	2.21	0.28	0.15	0.88	1.95	4.54	0.16	0.71	0.49	0.42	0.25
Nickel (Ni)	mg/kg	19.8	37	12	20	35	46	52.4	7.4	25.2	26.4	10.9	38	15.2	26.4	209	48.8	42.9	74.8	43.4	30.8	14.8	83.4	57.5	33.9
Niobium (Nb)	mg/kg	7.6	9	<1	1	<1	3	4.9	6.9	6.3	5.8	6.2	8.5	6.7	6.8	6.2	7.6	9.1	9.5	6.3	9.7	12.7	7.8	9.1	7.4
Phosphorous (P)	mg/kg	320	1400	500	4000	1600	1700	500	490	530	700	130	550	350	690	1170	590	190	760	600	550	650	220	540	590
Potassium (K)	%	3.84	3.57	3.8	4.94	4.68	4.07	2.68	3.03	3.72	3.87	3.4	3.79	3.58	3.08	3.24	2.82	5.16	4.68	3.62	5.05	4.85	3.72	5.53	3.98
Rhenium (Re)	mg/kg	<0.002						<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Rubidium (Rb)	mg/kg	80.6						94.2	123	165	113	121	115	159	144	140.5	111	114.5	95.3	84.2	108	70.8	135	143	165.5
Scandium (Sc)	mg/kg	11.3	9	7	10	10	10	7.6	2.5	8.7	9	9.9	12.5	7.3	10.7	21.2	10.3	12.8	11.2	10.3	15.9	6.4	10.5	12.2	12.1
Selenium (Se)	mg/kg	1	<1	<1	3	<1	<1	<1	1	<1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Silver (Ag)	mg/kg	0.04	0.9	<0.2	<0.2	<0.2	0.2	0.27	0.05	0.01	0.03	0.13	0.02	0.06	0.03	0.09	0.04	0.03	0.31	0.09	0.01	0.04	0.11	0.07	0.06
Sodium (Na)	%	0.02	0.05	0.04	0.02	0.02	0.03	0.01	0.03	0.04	0.04	0.04	0.02	0.04	1.85	0.02	0.03	0.03	0.04	0.03	0.03	0.02	0.02	0.05	0.02
Strontium (Sr)	mg/kg	228	32	106	73	32	60	9.8	148.5	120.5	67.2	59.9	34.8	34.2	342	53.2	34.4	99.1	85.6	42.6	153	292	34.2	80.4	61.2
Sulphur (S)	%	0.01	70	199	120	149	52	0.04	0.01	0.01	0.18	0.01	<0.01	<0.01	0.21	<0.01	<0.01	<0.01	0.12	0.13	0.02	0.01	<0.01	0.01	0.05
Tantalum (Ta)	mg/kg	0.5	<1	<1	<1	<1	<1	0.33	0.41	0.39	0.4	0.44	0.59	0.53	0.45	0.36	0.54	0.63	0.57	0.43	0.67	1.09	0.53	0.67	0.51
Tellurium (Te)	mg/kg	0.05	<1	<1	<1	<1	<1	0.13	0.05	<0.05	0.06	0.09	<0.05	<0.05	<0.05	0.07	<0.05	0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Thallium (Tl)	mg/kg	0.32						0.53	0.99	1.57	1.07	0.71	0.62	0.93	1.51	1.68	1.15	1.05	0.73	0.46	0.93	0.37	0.91	1.52	1.01
Thorium (Th)	mg/kg	13.4	22	9	12	9	10	8.4	19.9	9.4	9.4	9.3	11	10	10.2	7.3	11.9	9.1	8.5	8	11.1	47.7	8.3	7.3	7.7
Tin (Sn)	mg/kg	1.2	1	<1	<1	<1	1	0.7	1.1	0.9	0.9	1.6	1.4	1.2	1	1.3	1.3	1.8	1.3	1.1	3.3	2.3	1.7	1.7	1.6
Titanium (Ti)	%	0.296	0.42	0.42	0.53	0.36	0.48	0.24	0.124	0.234	0.274	0.25	0.377	0.238	0.293	0.361	0.301	0.388	0.329	0.263	0.398	0.202	0.321	0.4	0.316
Tungsten (W)	mg/kg	3.1	2	4	2	3	<1	1.2	4.4	0.7	0.9	7.4	0.7	2.3	1.7	0.6	2.1	4.6	1.7	1.4	11	3.8	2.4	2.4	1.8
Uranium (U)	mg/kg	2.3	1370	4	4	<2	18	28.5	3.4	2.9	4.3	2.6	2.6	1.1	3	5.5	10.5	2.1	2.8	3.4	9	1.6	3.2	9.3	30
Vanadium (V)	mg/kg	26	246	23	46	45	98	86	11	59	78	23	138	77	74	107	55	54	98	79	103	32	64	62	74
Yttrium (Y)	mg/kg	6.6	22	15	10	17	7	6.1	14.6	7.1	6.2	4.9	3.9	3.9	11	6.2	5.5	7.3	4.8	7.4	3.9	18.8	4.1	2.5	7.9
Zinc (Zn)	mg/kg	15	38	14	26	13	51	40	6	58	39	14	23	20	68	110	114	26	63	47	36	8	34	41	9
Zirconium (Zr)	mg/kg	124.5	117	120	123	112	116	94.7	188.5	97.4	103.5	120.5	133	111.5	92.7	79	126.5	170.5	121.5	102.5	185.5	387	140.5	186.5	129.5

Table B7 – Main Zone core sample metal contents.

Parameter	Units	MZ-07-01 (20-20.5)	MZ-07-01 (50-50.5)	MZ-07-01 (94-94.5)	MZ-07-01 (105-105.5)	MZ07-01 (13-13.5)	MZ07-01 (164-164.43)	MZ07-01 (209-209.56)	MZ07-01 (26-26.6)	MZ-07-03 (55-55.5)	MZ-07-03 (100-100.5)	MZ-07-03 (170-170.5)	MZ-07-03 (195-195.5)	MZ-07-04 (20-20.5)	MZ-07-04 (30-30.5)	MZ-07-04 (40-40.5)	MZ07-04 (7-7.5)	MZ07-04 (93.72-94.2)	MZ-07-05 (31-31.5)
Aluminum (Al)	%	7.2	8.44	12.75	7.95	7.8	6.02	6.16	7.93	7.36	7.63	7.67	8.11	11.35	6.91	7.87	7.76	6.44	7.65
Antimony (Sb)	mg/kg	0.07	<0.05	0.08	0.06	0.19	0.08	0.08	0.12	0.13	0.05	0.07	0.11	0.06	0.05	0.09	0.12	0.05	0.06
Arsenic (As)	mg/kg	0.6	0.6	0.6	0.3	1.5	0.3	0.2	0.5	0.7	0.2	<0.2	1.8	2.6	0.6	0.3	0.5	0.2	<0.2
Barium (Ba)	mg/kg	730	230	300	480	940	280	200	510	1010	950	450	180	160	320	1010	560	220	110
Beryllium (Be)	mg/kg	6.42	4.48	9.64	8.41	6.6	6.55	8	6.97	8.25	9.09	6.17	13.1	7.56	4.37	3.04	2.14	9.8	7.7
Bismuth (Bi)	mg/kg	0.92	0.23	0.25	3.11	1.95	3	3.61	0.79	2.23	0.44	1.25	7.31	0.09	9.49	3.28	9.86	1.03	4.03
Cadmium (Cd)	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium (Ca)	%	0.13	0.1	0.07	0.12	0.09	0.06	0.32	0.16	1.95	0.31	0.48	0.14	0.11	0.11	0.15	0.13	0.25	2.86
Cerium (Ce)	mg/kg	47.4	6.09	5.13	7.27	43.6	13.8	33.4	57.1	69.9	56	24.1	12.95	109.5	5.6	23.7	19.85	37.5	16
Cesium (Cs)	mg/kg	14.6	2.57	26.2	28.2	14	5.66	6.91	19.55	25.6	7.88	6.27	23.7	20.5	9.43	10.65	7.78	7.6	6.17
Chromium (Cr)	mg/kg	39	19	40	58	52	6	6	54	131	52	94	55	95	46	58	52	9	14
Cobalt (Co)	mg/kg	13.2	5.4	6.8	8.3	22.2	5.3	1.7	26.2	13.7	11	31.5	6.9	5.6	6.1	23	15.5	1.1	10.4
Copper (Cu)	mg/kg	49.5	3.6	2.6	4.9	42.5	12	11.4	44.7	239	28.1	12.5	9.7	3.2	16.6	10.3	30.7	15	4.8
Gallium (Ga)	mg/kg	13.6	13.6	59.9	28.5	23.2	22.1	25.5	21.2	18.9	16.35	21.5	23.8	43.7	18	20.3	22.4	27	18.9
Germanium (Ge)	mg/kg	0.05	<0.05	<0.05	<0.05	0.13	0.09	0.09	0.12	0.08	0.06	0.05	<0.05	0.11	<0.05	0.05	0.13	0.15	<0.05
Hafnium (Hf)	mg/kg	2.4	2.6	3.8	3	3.9	5.1	5.9	3.7	9.5	2.5	7.1	3.1	3.9	3.3	3.8	3.4	6.2	8.2
Indium (In)	mg/kg	0.013	0.007	0.054	0.054	0.032	0.008	0.017	0.02	0.025	0.021	0.023	0.032	0.023	0.026	0.024	0.029	0.01	0.005
Iron (Fe)	%	2.5	0.38	1.44	2.67	2.34	0.64	0.66	1.86	2.73	2.6	2.35	0.91	8.52	0.95	2.71	1.81	0.68	0.93
Lanthanum (La)	mg/kg	25.2	2.3	1.4	1	17.3	7.9	19.2	28.6	36.7	29.4	11.2	3.5	69.3	3	10.8	7.2	22.7	11.9
Lead (Pb)	mg/kg	4.2	27.1	27.3	42.2	13.4	43.7	34.6	73.6	18.6	11.1	9.1	36.7	26.7	39.9	16.6	25.2	57.5	113.5
Lithium (Li)	mg/kg	72.7	61.5	76.2	94.5	71.3	33	64.5	117	138.5	42.3	76	76.4	109	73.5	65.5	50.1	21.2	131
Magnesium (Mg)	%	2.17	2.46	0.65	1.74	1.26	0.61	0.89	2.55	2	1.28	2.11	1.3	0.81	0.87	1.55	1.03	0.26	1.64
Manganese (Mn)	mg/kg	141	84	69	325	158	197	223	92	174	316	342	103	94	65	296	111	177	289
Molybdenum (Mo)	mg/kg	3.37	1.82	0.95	1.76	8.95	109.5	145.5	16.3	56.7	33.3	8.25	5.71	1.04	1.25	1.82	3.81	81.6	2.4
Nickel (Ni)	mg/kg	18.1	36	25.2	33.7	23.9	6.5	1.4	32.6	107	24.1	90.3	41.1	21.8	26.3	34.4	27.8	1.3	50.4
Niobium (Nb)	mg/kg	3.4	5.2	10.9	7.4	5	14.2	15.6	5.3	5.5	5	7.4	6	8.6	5.7	6.5	6	17.5	11.9
Phosphorous (P)	mg/kg	570	290	280	560	550	80	100	620	3340	540	2060	530	520	400	580	620	110	620
Potassium (K)	%	3.46	2.89	3.82	3.29	5.28	5.67	5.49	4.29	3.26	3.69	3.84	3.48	4.14	2.92	3.83	3.87	3.83	2.79
Rhenium (Re)	mg/kg	<0.002	0.003	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	0.004	0.002	<0.002	0.002	0.002	0.002	<0.002	<0.002	0.002	0.008
Rubidium (Rb)	mg/kg	194	76.2	174.5	232	186	355	413	273	365	184.5	161	332	177.5	165.5	136	190.5	393	109
Scandium (Sc)	mg/kg	7.2	4.7	11	11.5	9.6	1.2	1.3	9.5	6.7	8.8	9.8	10.2	12.6	7.7	10.3	9.7	1.6	4.6
Selenium (Se)	mg/kg	<1	<1	<1	1	1	1	1	2	1	<1	1	1	<1	<1	<1	7	<1	2
Silver (Ag)	mg/kg	0.02	0.4	<0.01	1.15	0.08	0.15	0.01	0.13	0.08	<0.01	0.96	2.9	<0.01	1.08	0.48	0.1	0.06	1.45
Sodium (Na)	%	0.05	0.04	0.08	0.06	0.1	0.06	0.05	0.06	1.61	1.13	0.03	0.03	0.03	0.05	0.04	0.09	2.49	0.02
Strontium (Sr)	mg/kg	43.2	24.4	23	22.1	77.4	48.1	35.2	46.7	238	229	73.2	18.8	152	22.9	115.5	22.7	82.6	36.1
Sulphur (S)	%	0.65	<0.01	0.04	<0.01	0.04	0.16	0.09	0.54	1.37	0.26	0.01	0.11	0.02	0.05	0.02	0.16	0.04	<0.01
Tantalum (Ta)	mg/kg	0.25	0.35	0.64	0.47	0.37	1	1.09	0.41	0.34	0.33	0.45	0.41	0.51	0.38	0.43	0.43	1.41	0.92
Tellurium (Te)	mg/kg	0.18	<0.05	0.07	0.33	0.24	0.14	0.07	0.2	0.19	0.05	0.21	0.41	0.06	0.51	0.41	0.81	<0.05	0.25
Thallium (Tl)	mg/kg	1.96	0.25	4.37	3.16	2.68	3.87	3.89	2.19	3.04	1.92	1.39	3.15	2.87	1.36	2.37	1.96	3.9	0.77
Thorium (Th)	mg/kg	8.6	7.7	5.4	5.7	10.1	25.8	33.4	13	14.5	9.5	13.3	7.6	9.9	10.1	9.9	9.9	30.4	35
Tin (Sn)	mg/kg	0.9	0.6	2.1	4	1.7	1.3	1.4	1.5	3.6	1	1.9	1.6	1.8	1.3	1.1	1.6	1.5	2.1
Titanium (Ti)	%	0.204	0.131	0.254	0.262	0.209	0.039	0.038	0.251	0.252	0.227	0.291	0.251	0.385	0.165	0.263	0.249	0.042	0.156
Tungsten (W)	mg/kg	8.3	4	9.6	12.9	23.2	1	1.9	9.9	15.2	2.7	15.2	4.8	5.9	7.1	3.3	15.7	7.1	7.8
Uranium (U)	mg/kg	3.5	97.2	136.5	264	13.5	21.2	22.9	30.9	6.5	7	24.8	550	80.6	215	32	36.7	29.9	294
Vanadium (V)	mg/kg	60	324	215	222	73	7	6	86	39	65	56	199	109	199	74	85	7	359
Yttrium (Y)	mg/kg	7.7	12.5	1.2	7.8	8.2	2.8	3.2	9.5	11.9	7.1	14.6	12.9	0.9	8.6	7.7	7.6	3.8	19.5
Zinc (Zn)	mg/kg	19	8	17	53	26	12	15	26	40	47	67	17	24	17	59	24	12	8
Zirconium (Zr)	mg/kg	86	94.1	122	99.5	121	81	99	120	370	92.5	248	104.5	148	108	133.5	106.5	116.5	246

Table B8 – Main Zone core sample metal contents continued.

Parameter	Units	MZ-07-05 (38-38.5)	MZ-07-05 (55-55.5)	MZ-08-02 (29.5-30.0)	MZ-08-02 (85.0-85.5)	MZ08-03 (10.48-11)	MZ08-03 (24-24.25)	MZ08-04 (151-151.5)	MZ08-04 (166.5-167.02)	MZ08-04 (211.5-211.84)	MZ08-04 (251.05-251.55)	MZ-08-04 (110.0-110.5)	MZ-08-04 (189.06-189.32)	MZ-08-04-005 (136.26-136.50)	MZ-08-04-006 (166.23-166.50)	MZ-08-04-008 (216.18-216.41)	MZ08-05 (129-129.5)	MZ08-05 (15-15.5)	MZ-08-05 (19.5-20.5)
Aluminum (Al)	%	8.19	7.86	16	12	7.02	7.46	6.28	6	5.52	6.31	12.2	11.8	14.8	11.7	11.3	6.62	7.25	13.2
Antimony (Sb)	mg/kg	<0.05	0.06	<1	<1	0.15	0.16	0.08	0.2	0.12	0.22	<1	<1	<1	<1	<1	0.1	0.18	<1
Arsenic (As)	mg/kg	<0.2	0.3	3	1	<0.2	2	<0.2	1.9	0.5	0.9	1	1	3	1	1	0.5	0.6	1
Barium (Ba)	mg/kg	130	720	1120	314	590	1000	280	220	180	230	164	232	147	240	200	340	830	494
Beryllium (Be)	mg/kg	5.5	2.35	9.4	4.4	5.59	2.97	6.28	9.96	7.03	9.85	6.1	22	12.5	11	10.3	6.87	3.4	5.1
Bismuth (Bi)	mg/kg	0.45	0.99	<1	<1	8.97	1.28	1.96	0.43	1.02	182.5	7	<1	7	<1	<1	3.6	2.44	<1
Cadmium (Cd)	mg/kg	<0.02	0.08	1	<1	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<1	<1	1	<1	<1	<0.02	<0.02	<1
Calcium (Ca)	%	0.12	0.13	0.43	0.09	0.92	1.08	0.23	0.09	0.23	0.21	0.1	0.25	1.02	0.3	0.24	0.12	0.14	0.09
Cerium (Ce)	mg/kg	0.89	45	45	4	34.7	59.6	24.5	28.2	32.2	41.1	4	30	13	26	27	29.8	78.6	64
Cesium (Cs)	mg/kg	16.45	13.4			39.9	9.67	9.37	8.27	9.34	10.4						10.55	21.6	
Chromium (Cr)	mg/kg	21	49	75	102	7	22	7	8	6	6	139	117	95	95	86	4	22	80
Cobalt (Co)	mg/kg	5.6	51.7	8	2	3.9	8.6	3.1	3.6	1.9	19.4	18	2	2	6	3	4.8	17.8	22
Copper (Cu)	mg/kg	3.4	96.9	83	2	122.5	128.5	57	23	26.6	37	19	26	16	27	42	43.8	77.8	20
Gallium (Ga)	mg/kg	23.3	18.5	20	16	17.9	20.4	25.5	24.9	23.4	26.4	20	25	21	26	26	27.1	19.7	19
Germanium (Ge)	mg/kg	<0.05	0.06	<1	<1	0.1	0.15	0.07	0.08	0.09	0.07	<1	<1	<1	<1	<1	0.06	0.12	<1
Hafnium (Hf)	mg/kg	3.3	3.4	3	5	2.3	3.5	6	6.5	5.5	5.9	4	4	6	4	5	6.3	4	3
Indium (In)	mg/kg	0.01	0.025			0.028	0.018	0.024	0.013	0.014	0.021						0.022	0.023	
Iron (Fe)	%	1.27	2.63	2.62	0.38	1.15	2.2	0.69	0.73	0.53	1.07	0.38	0.79	0.48	0.66	0.86	0.6	1.97	2.3
Lanthanum (La)	mg/kg	<0.5	23.1	22	2	17.5	29.4	13.3	16	19.2	25.3	2	19	11	16	16	17	41.8	35
Lead (Pb)	mg/kg	14.7	18.7	18	15	3.6	11.2	95.1	35.1	91.8	36.4	17	49	44	25	120	88.6	7.7	10
Lithium (Li)	mg/kg	58.3	55.2	55	22	69.5	76.7	42.4	42.9	44.3	60	79	50	97	54	62	31.4	50.7	94
Magnesium (Mg)	%	1.37	1.32	1.42	1.26	1.4	1.47	0.58	1.04	0.63	1.03	3.46	1.34	3.28	1.92	1.91	0.35	1.24	3.46
Manganese (Mn)	mg/kg	117	285	200	<100	208	254	136	168	104	168	<100	200	200	200	200	178	107	200
Molybdenum (Mo)	mg/kg	1.6	5.93	9	3	16.8	40.7	15.9	2	18.7	110	5	37	1510	3	27	74.5	3.52	2
Nickel (Ni)	mg/kg	20.9	43.4	22	14	5.4	14.7	2.3	8.5	2.4	5	53	12	34	9	7	3.3	18.5	27
Niobium (Nb)	mg/kg	6.8	6.3	1	12	4.9	6.6	15.2	12	12.4	16.5	11	9	25	8	12	19.8	6.9	3
Phosphorous (P)	mg/kg	460	590	1300	400	210	420	120	80	100	100	400	400	500	400	400	110	360	900
Potassium (K)	%	3.37	4.24	5.96	5.52	4.21	3.89	5.31	5.89	4.63	5.5	5	6.89	5.99	7.28	6.96	6.12	4.6	4.44
Rhenium (Re)	mg/kg	<0.002	0.002			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002						0.003	<0.002	
Rubidium (Rb)	mg/kg	150.5	161			335	197	460	430	403	460						460	259	
Scandium (Sc)	mg/kg	3.7	9.8	4	1	1.9	4.3	1.3	1.3	1.1	1.4	1	1	2	1	1	1.7	4.9	5
Selenium (Se)	mg/kg	<1	1	<1	<1	1	1	1	1	1	2	<1	<1	<1	<1	<1	1	2	<1
Silver (Ag)	mg/kg	0.17	0.05	<0.2	<0.2	<0.01	0.08	0.02	0.02	0.1	0.05	2.7	<0.2	0.9	<0.2	<0.2	0.26	0.03	<0.2
Sodium (Na)	%	0.02	0.04	2.33	0.09	0.1	1.46	0.8	0.06	0.65	0.42	0.03	0.88	0.04	0.07	0.07	1.15	0.05	0.07
Strontium (Sr)	mg/kg	8	74	275	44	12.5	381	59.8	42.7	40.6	47.9	35	47	37	44	33	85.7	52.6	17
Sulphur (S)	%	<0.01	0.28	682	21	0.32	0.48	0.33	0.04	0.15	0.32	300	1550	1920	150	3180	0.3	0.71	92
Tantalum (Ta)	mg/kg	0.45	0.43	<1	<1	0.5	0.53	1.09	0.91	0.99	1.1	<1	<1	<1	<1	<1	1.46	0.57	<1
Tellurium (Te)	mg/kg	0.07	0.15	<1	<1	0.05	0.64	0.09	<0.05	0.13	1.09	<1	<1	<1	<1	<1	0.19	0.76	<1
Thallium (Tl)	mg/kg	1.56	2.08			3.25	2.4	4.57	3.86	3.63	4.16						4.64	2.78	
Thorium (Th)	mg/kg	4.9	11.6	8	27	10.9	10.7	32.4	28.5	27.1	31	26	22	29	25	25	31.4	15.6	13
Tin (Sn)	mg/kg	1.5	1.2	1	<1	1.8	1.4	1.6	1.1	1.2	1.8	<1	<1	4	<1	1	2	1.5	<1
Titanium (Ti)	%	0.181	0.24	0.27	0.08	0.056	0.161	0.042	0.037	0.032	0.041	0.08	0.08	0.09	0.08	0.08	0.045	0.149	0.28
Tungsten (W)	mg/kg	3.6	5.7	16	4	4.7	5.4	5.7	3.2	3.2	1.7	5	4	8	4	5	1.2	9.7	12
Uranium (U)	mg/kg	10.9	164.5	3	33	4.6	3.1	33.7	44.1	26.5	30.2	121	85	261	22	29	35.4	8.8	17
Vanadium (V)	mg/kg	47	63	53	84	10	34	4	4	4	5	50	15	58	15	12	5	32	43
Yttrium (Y)	mg/kg	2.5	7.7	9	5	7.2	6.3	3.7	3.6	2.7	3.3	4	3	6	3	3	3.5	10.3	11
Zinc (Zn)	mg/kg	27	63	33	5	15	22	8	23	10	10	7	26	13	17	15	11	29	35
Zirconium (Zr)	mg/kg	124	112	127	107	67.1	117	99.5	106.5	86.5	102	102	96	109	101	98	103.5	111.5	116

Table B9 – Main Zone core sample metal contents continued.

Parameter	Units	MZ-08-05 (39.5-40.0)	MZ-08-05-004 (123.56-123.84)	MZ08-06 (72-72.3)	MZ08-06 (9-9.5)	MZ-08-06 (65.0-65.5)	MZ-08-06 (80.0-80.5)	MZ-08-07 (29.5-30.0)	MZ-08-07-001 (30.0-30.32)	MZ-08-16 (29.5-30.0)	MZ-09 03 (174.22-174.85)	MZ09-01A (200-201)	MZ09-01A (250.05-251.06)	MZ09-01A (25-26)	MZ09-01A (99.73-100.65)	MZ09-02 (101-102)	MZ09-02 (150-151)	MZ09-02 (50.91-51.94)	MZ09-03 (124.15-124.68)	MZ09-03 (74.5-75)
Aluminum (Al)	%	14.3	12.2	7.82	7.5	12.6	11.2	11.4	12	16	8.41	7.23	7.1	7.13	7.18	8.25	6.9	7.93	7.65	8.92
Antimony (Sb)	mg/kg	<1	<1	0.1	0.11	<1	<1	<1	<1	<1	0.08	0.08	0.11	0.1	0.07	0.24	0.07	0.1	0.07	0.18
Arsenic (As)	mg/kg	2	1	0.8	0.3	2	3	<1	1	2	0.2	0.3	<0.2	0.3	0.3	34.2	1.1	1.3	<0.2	0.2
Barium (Ba)	mg/kg	897	306	1150	1050	1900	1770	922	918	588	1070	880	160	670	650	300	580	820	560	740
Beryllium (Be)	mg/kg	3.7	4.4	6.27	3.94	5.6	9.4	10	8.7	7	4.3	3.73	5.22	1.57	1.27	6.1	5.19	3.28	15.3	11.2
Bismuth (Bi)	mg/kg	10	8	1.09	0.37	<1	<1	<1	<1	13	0.34	0.42	0.6	0.81	2.27	50.1	2.35	1.91	0.28	0.84
Cadmium (Cd)	mg/kg	<1	<1	0.02	<0.02	<1	<1	<1	<1	<1	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.12	<0.02
Calcium (Ca)	%	0.24	0.11	0.41	0.22	0.88	1.72	0.45	0.56	0.23	0.85	0.64	1.06	1.64	1.45	0.23	1.46	1.11	2.01	1.87
Cerium (Ce)	mg/kg	35	19	78.5	57.8	100	87	62	55	7	56.7	65.3	14.45	67.3	81.7	83.4	37.6	87	51.4	67.8
Cesium (Cs)	mg/kg			16.6	9.89						22.3	6.43	10.7	8.03	7.18	31.5	29.7	7.34	16.75	24.4
Chromium (Cr)	mg/kg	123	85	62	46	144	179	160	126	130	58	35	11	56	56	39	40	42	40	53
Cobalt (Co)	mg/kg	31	10	16.8	14.4	15	8	4	4	177	15.1	10.2	13.8	14.6	17.9	47.7	11.7	13	9.4	15.6
Copper (Cu)	mg/kg	106	35	137	77.2	68	121	79	39	37	69.8	64.6	7.2	110	245	63.1	49.3	174	26.1	154
Gallium (Ga)	mg/kg	18	25	22.4	18	22	19	21	22	30	26	20.1	26.1	18.1	19.2	28.6	18.65	19.95	20	26
Germanium (Ge)	mg/kg	<1	<1	0.15	0.14	<1	<1	<1	<1	<1	0.24	0.12	0.07	0.15	0.15	0.58	0.11	0.16	0.12	0.14
Hafnium (Hf)	mg/kg	3	5	3.5	2.8	6	5	5	5	4	2.9	4.8	7.4	2.7	3.6	3.9	3.1	3.4	2.1	3.8
Indium (In)	mg/kg			0.034	0.019						0.033	0.014	0.017	0.031	0.024	0.056	0.026	0.043	0.025	0.016
Iron (Fe)	%	2.4	0.8	3.51	2.91	2.84	2.87	1.77	1.79	3.94	3.08	2.06	0.78	3.5	4.42	6.13	2.7	3.56	2.29	2.51
Lanthanum (La)	mg/kg	19	15	41	30.4	61	55	41	35	7	25.5	36.5	8.3	36.6	45.2	57	19.3	47	25.8	35.1
Lead (Pb)	mg/kg	120	51	82.6	13.5	27	169	53	45	52	44.7	43.1	6.7	15.7	24.8	87.4	19.4	11.7	43.3	22.6
Lithium (Li)	mg/kg	61	26	60.3	54.6	61	38	29	30	109	134.5	37.3	71.4	44.1	55.4	191	66.7	48.9	91.1	102
Magnesium (Mg)	%	3.15	0.9	1.5	1.52	2.74	1.32	0.83	0.88	3.59	1.28	1.04	1.82	0.99	1.19	3.45	1.53	1.39	0.9	1.27
Manganese (Mn)	mg/kg	100	200	389	306	400	500	400	400	300	631	346	132	399	279	922	394	335	351	295
Molybdenum (Mo)	mg/kg	4	144	2.84	17.45	10	71	30	22	78	49.6	19.65	1.15	5.02	13.6	641	98.7	23.1	42	28.6
Nickel (Ni)	mg/kg	58	16	40.1	28.3	58	33	9	8	116	35.1	20.9	34.9	31	33.4	50.6	44.6	27.1	21.9	52
Niobium (Nb)	mg/kg	2	13	7.3	5.9	5	6	5	5	6	7	7	11.9	6	5.8	7.7	5.4	6.6	8.6	7.1
Phosphorous (P)	mg/kg	1600	400	690	560	2600	2000	1000	1000	1700	660	430	220	580	650	700	480	650	540	650
Potassium (K)	%	7.93	7.71	4.45	5.03	7.89	4.72	6.61	6.6	5.46	4.11	4.25	4.12	2.07	2.12	2.72	2.89	3.71	1.59	3.32
Rhenium (Re)	mg/kg			<0.002	0.002						0.003	<0.002	<0.002	0.002	0.002	0.256	0.004	0.002	0.003	<0.002
Rubidium (Rb)	mg/kg			298	173.5						377	257	226	123.5	122.5	688	280	189	174	442
Scandium (Sc)	mg/kg	9	1	12.3	8.4	4	3	1	1	15	14.2	5.4	2.8	8.7	10.3	14.4	7.3	9.7	8.1	9.5
Selenium (Se)	mg/kg	<1	<1	2	2	<1	<1	<1	<1	<1	2	2	2	2	3	4	2	2	1	3
Silver (Ag)	mg/kg	1.1	1.5	0.03	0.1	<0.2	0.6	<0.2	0.2	0.8	0.05	0.02	0.01	0.06	0.18	5.08	0.18	0.07	0.02	0.07
Sodium (Na)	%	0.09	0.05	1.63	0.82	0.26	2.45	1.63	1.73	0.06	2.8	2.22	0.04	2.41	2.51	0.05	1.46	2.21	3.22	3.03
Strontium (Sr)	mg/kg	106	58	377	229	247	468	192	196	20	363	268	31	468	377	27.3	156.5	343	588	486
Sulphur (S)	%	2590	3400	0.72	0.17	3080	6610	5500	7620	5720	0.41	0.38	0.34	0.87	1.77	1.76	0.5	1.36	0.11	0.66
Tantalum (Ta)	mg/kg	<1	<1	0.53	0.44	<1	<1	<1	<1	<1	0.47	0.54	1.05	0.41	0.41	0.64	0.38	0.46	0.44	0.52
Tellurium (Te)	mg/kg	<1	<1	0.33	0.08	<1	<1	<1	<1	<1	0.13	0.06	<0.05	0.39	0.34	1.62	0.23	0.4	0.06	0.09
Thallium (Tl)	mg/kg			3.04	1.59						4.43	2.58	1.61	1.32	1.36	7.6	3.27	2.01	1.64	4.81
Thorium (Th)	mg/kg	12	26	14.2	11.1	30	28	30	30	18	11.3	23.7	46.4	10.9	13.5	29.5	9.9	13.1	8	10.5
Tin (Sn)	mg/kg	1	2	1.5	0.9	<1	<1	2	<1	<1	1.3	1.1	2.4	1.2	1.3	2.4	0.9	1.7	1.7	1.9
Titanium (Ti)	%	0.45	0.08	0.312	0.249	0.35	0.29	0.18	0.17	0.58	0.307	0.185	0.125	0.253	0.272	0.201	0.226	0.275	0.224	0.237
Tungsten (W)	mg/kg	16	2	3.5	2.2	2	6	9	7	27	7.7	3.6	6.6	3	50.8	8	3.6	3.8	6.2	6.3
Uranium (U)	mg/kg	186	57	4	6.7	28	13	15	15	818	3.9	6	9.4	3.6	3.3	22.5	3.2	3.6	2.8	3
Vanadium (V)	mg/kg	112	17	90	66	44	32	23	24	198	96	43	53	67	80	150	62	67	55	60
Yttrium (Y)	mg/kg	15	3	11.3	8.5	11	8	5	5	24	10.5	7.9	5.7	10.2	11.3	19.9	8.9	11.6	9.9	8.7
Zinc (Zn)	mg/kg	53	13	59	44	52	55	38	39	54	62	39	11	44	46	83	32	41	60	43
Zirconium (Zr)	mg/kg	141	104	112.5	98.5	248	210	167	169	123	87	144	211	94.3	121.5	117.5	100.5	117	68.4	131

Table B10 – EZ core sample metal contents.

Parameter	Units	EZ08-01 (39.15-39.21)	EZ08-01 (42-42.5)	EZ08-01 (44.9-45)	EZ08-01 (46.3-46.4)	EZ08-01 (48-48.1)	EZ08-01 (51-51.11)	EZ08-01 (53-53.1)	EZ08-01 (54.8-54.9)	EZ08-01 (57-57.53)	EZ08-01 (59-59.1)	EZ08-01 (61.04-61.14)	EZ08-01 (63-63.1)	EZ08-01 (64.96-65.06)	EZ08-01 (66.95-67.1)	EZ08-01 (68.5-69)	EZ08-01 (71.5-71.6)
Aluminum (Al)	%	6.43	7.34	7.68	7.65	7.79	7.52	7.55	7.36	7.32	7.36	7.07	7.32	7.02	6.93	7.53	7.68
Antimony (Sb)	mg/kg	0.12	0.08	0.12	0.15	0.18	0.12	0.08	0.17	0.14	0.17	0.16	0.14	0.13	0.22	0.12	0.07
Arsenic (As)	mg/kg	1.4	0.5	0.6	0.9	1.1	0.6	0.4	1	<0.2	<0.2	0.3	5.3	0.3	0.5	0.3	0.6
Barium (Ba)	mg/kg	130	80	150	190	280	570	530	410	940	770	880	890	760	890	930	850
Beryllium (Be)	mg/kg	4.26	4.73	4.64	5.64	5.28	2.39	1.97	1.87	1.79	1.23	0.92	1.16	1.3	1.34	1.6	2.08
Bismuth (Bi)	mg/kg	1.04	0.52	0.18	0.34	0.33	0.18	0.12	0.21	0.23	0.25	0.29	0.93	0.33	0.37	0.42	0.52
Cadmium (Cd)	mg/kg	0.02	0.06	0.09	0.06	0.07	0.02	<0.02	<0.02	0.02	0.03	0.05	2.54	0.07	0.06	0.02	0.03
Calcium (Ca)	%	0.15	0.17	0.2	0.21	0.24	0.17	0.15	0.13	0.75	1.6	1.76	1.48	1.69	1.24	0.96	0.3
Cerium (Ce)	mg/kg	28.5	63.8	60.9	64.2	114.5	51	55.7	34.7	54.8	64.7	60.5	70.5	68	64.3	54.3	28.5
Cesium (Cs)	mg/kg	17.9	8.23	6.26	8.82	9.45	8.84	13.25	8.33	4.66	3.26	5.02	5.58	4.46	3.57	4.21	4.05
Chromium (Cr)	mg/kg	46	57	45	59	74	42	39	37	36	41	40	42	48	41	29	64
Cobalt (Co)	mg/kg	19.3	29.9	31.1	20	18.9	14.8	10.8	11.8	9.9	10	10.1	10.2	10.3	10.8	8.2	15.4
Copper (Cu)	mg/kg	64	147.5	91.5	44.7	36	8.3	4.4	9.1	23.3	39.5	38	55.8	36.1	36.9	33.2	11.6
Gallium (Ga)	mg/kg	19.55	18.95	19.55	20.3	20.7	20.8	20.6	20.2	18.75	18.75	17.75	18.15	17.8	17.55	19.35	25.3
Germanium (Ge)	mg/kg	0.1	0.14	0.15	0.15	0.19	0.16	0.16	0.1	0.13	0.15	0.14	0.15	0.16	0.15	0.12	0.14
Hafnium (Hf)	mg/kg	2.9	2.6	2.5	2.9	4.6	3	2.5	2.7	2.8	2.6	2.5	2.9	2.7	2.7	3.1	2.9
Indium (In)	mg/kg	0.037	0.022	0.027	0.033	0.034	0.031	0.026	0.024	0.023	0.026	0.031	0.066	0.026	0.027	0.022	0.032
Iron (Fe)	%	1.26	1.76	2.11	2.14	2.76	2.76	2.37	2.29	2.52	2.49	2.46	2.64	2.66	2.69	2.14	3.78
Lanthanum (La)	mg/kg	15.9	27.9	27.6	26.8	54.9	23.2	26.2	14.7	27	33.3	31.1	37.1	35.9	33.6	28.2	11.8
Lead (Pb)	mg/kg	5.4	7	9	6.7	7.2	3.5	2.6	3	10.1	24	24.1	117	22.7	21	11.8	3.7
Lithium (Li)	mg/kg	86	86.5	93	96.9	77.2	58.7	47.2	54.1	44.7	38.6	34.6	42.2	40.3	47.8	38.6	65.1
Magnesium (Mg)	%	1.79	2.15	2.1	2.08	1.99	1.63	1.45	1.6	1.16	0.91	0.85	0.9	0.9	1.06	0.87	1.65
Manganese (Mn)	mg/kg	113	177	219	193	205	288	240	318	350	386	431	783	432	419	254	465
Molybdenum (Mo)	mg/kg	0.36	0.2	0.27	0.32	0.53	0.32	0.18	0.46	2.17	2.09	1.91	1.84	2.61	1.64	1.6	2.14
Nickel (Ni)	mg/kg	53	46.7	40.3	33.1	37.8	24.5	21	20.6	17.4	18.9	17.8	18.9	24.1	20.1	16.3	37.9
Niobium (Nb)	mg/kg	5.6	6.2	6.4	6.6	7.8	6.2	5.7	6.1	6.1	6.1	5.8	6.3	6.2	5.8	5.7	7.3
Phosphorous (P)	mg/kg	540	640	650	710	910	650	580	550	520	520	480	520	500	500	470	670
Potassium (K)	%	3.11	3.28	3.88	4.01	4.28	5.28	5.22	5.02	2.94	1.85	2.1	2.76	1.85	2.62	3.06	3.14
Rhenium (Re)	mg/kg	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Rubidium (Rb)	mg/kg	220	158.5	134.5	154	191	178.5	222	194.5	123.5	89.7	86.5	161	96.5	110	134.5	135.5
Scandium (Sc)	mg/kg	8.8	9.2	8.8	9.1	10.8	9	8.2	7.3	7.3	7.7	7.3	7.8	8	7.7	5.6	12.4
Selenium (Se)	mg/kg	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1
Silver (Ag)	mg/kg	1.03	0.41	0.18	0.11	0.08	0.02	0.01	<0.01	0.01	0.06	0.05	0.3	0.02	0.03	0.02	<0.01
Sodium (Na)	%	0.01	0.01	0.05	0.06	0.06	0.09	0.03	0.03	2.23	2.67	2.31	1.92	2.37	1.95	2.31	1.85
Strontium (Sr)	mg/kg	13.7	9.3	19.1	21.1	22.9	38.6	28.9	27.1	357	475	404	395	470	334	301	154.5
Sulphur (S)	%	0.02	0.01	0.02	0.04	0.02	0.01	0.01	0.01	0.15	0.24	0.19	0.62	0.21	0.22	0.13	0.13
Tantalum (Ta)	mg/kg	0.39	0.45	0.45	0.47	0.57	0.43	0.38	0.45	0.45	0.45	0.44	0.47	0.45	0.43	0.45	0.52
Tellurium (Te)	mg/kg	0.28	0.12	0.08	0.09	0.09	0.06	0.07	0.1	<0.05	0.05	0.05	0.09	0.06	0.05	0.1	0.11
Thallium (Tl)	mg/kg	2.31	1.28	0.93	1.69	1.82	1.63	1.74	1.56	1.13	0.89	0.62	1.82	0.99	0.96	1.22	1.49
Thorium (Th)	mg/kg	11.5	10.1	9.4	9.8	18.7	9.5	9.4	10	11.7	12.8	12.1	13.9	14.1	13.2	12.9	8.6
Tin (Sn)	mg/kg	0.9	0.9	0.9	1	1.1	1	0.8	1	0.8	0.9	0.9	1.1	0.9	0.8	0.8	1.2
Titanium (Ti)	%	0.211	0.248	0.246	0.263	0.31	0.231	0.219	0.222	0.218	0.225	0.215	0.233	0.226	0.228	0.193	0.301
Tungsten (W)	mg/kg	7.8	7.6	5.1	12.2	13.1	5	3.4	7.5	1.3	1	0.9	1.4	2.3	1.7	2.5	3.8
Uranium (U)	mg/kg	8.2	5.7	6.9	5.3	9.2	3.7	3.4	1.9	3.1	3.2	3	3.5	3.4	3.2	3.6	6.7
Vanadium (V)	mg/kg	73	55	53	61	80	69	65	60	57	58	57	62	62	62	46	95
Yttrium (Y)	mg/kg	8.4	6.8	7	7.6	10.5	7.1	6.7	6.7	9.3	10.7	10.2	10.8	10.8	10.4	7.6	9
Zinc (Zn)	mg/kg	108	206	149	91	89	63	49	55	51	45	46	567	60	58	33	80
Zirconium (Zr)	mg/kg	101.5	88.6	91.5	104.5	166	104	86.9	92.8	94.5	91.4	85.7	97.9	93.7	95.6	100.5	96.5

Table B11 – Andrew Lake core sample ABA results.

Parameter	Units	ANDW07-01 (17-18.16)	ANDW-07-01 (185-185.5)	ANDW-07-01 (200-200.5)	ANDW-07-01 (255-255.5)	ANDW-07-01 (50-50.5)	ANDW07-01 (51.5-53)	ANDW07-01 (75.9-76.9)	ANDW-07-01 (80-80.5)	ANDW07-01 (91-92)	ANDW-07-02 (26-26.5)	ANDW07-02 (31-31.96)	ANDW07-02 (44-44.7)	ANDW-07-02 (51-51.5)	ANDW08-01 (17.5-18)	ANDW08-01 (28.6-29.1)	ANDW08-01 (49.1-49.6)	ANDW08-01 (72-72.5)	ANDW-08-01 (215.0-215.5)
pH, paste	---	7.9	7.6	7.2	7.5	7	7.7	7.6	7.4	8.3	7.4	7.6	7.7	7.3	7.6	7.4	7.6	7.6	7.31
Neutralizing Potential (NP)	g $CaCO_3$/kg	2	4.5	6.8	6.8	4.5	3	4	4.5	8	6.8	2	5	6.8	1	1	2	2	15.8
Acid Potential (NP)	g $CaCO_3$/kg	0.9	1.25	1.56	1.25	1.25	0.6	<0.3	1.56	0.9	0.63	0.3	<0.3	0.94	<0.3	0.6	0.6	<0.3	1.2
Net Acid Generation (NAG)	g $CaCO_3$/kg	1					2	4		7		2	5		1	0	1	2	-14.6
Ratio (NP:MPA)	---	2.13					4.8	25.6		8.53		6.4	32		6.4	1.6	3.2	12.8	
Total Sulphur	%	0.03	0.04	0.05	0.04	0.04	0.02	<0.01	0.05	0.03	0.02	0.01	<0.01	0.03	<0.01	0.02	0.02	<0.01	0.04
Sulphide-Sulphur	%	<0.01	<0.01	0.02	0.01	<0.01	0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	0.04
Sulphate-Sulphur (Carbonate Leach)	%	0.03	0.04	0.03	0.03	0.05	0.01	<0.01	0.03	0.02	0.03	0.01	<0.01	0.03	<0.01	<0.01	0.01	<0.01	
Sulphate-Sulphur (HCl Leach)	%		<0.01	<0.01	<0.01	<0.01			<0.01		<0.01			<0.01					0.004
Total Inorganic Carbon	%	<0.05	0.06	0.08	0.07	0.05	<0.05	<0.05	0.05	0.09	0.08	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	
CO_2	%	<0.2	0.2	0.3	0.3	0.2	<0.2	<0.2	0.2	0.3	0.3	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	

Parameter	Units	ANDW-08-01 (25.0-25.5)	ANDW-08-01 (50.0-50.5)	ANDW-08-01 (75.0-75.5)	ANDW-08-01-007 (214.75-215.0)	ANDW-08-01-008 (249.0-249.2)	ANDW-08-03 (110.0-110.5)	ANDW-08-03 (190.0-190.5)	ANDW-08-03 (30.0-30.5)	ANDW-08-03 (60.0-60.5)	ANDW-08-03 (80.0-80.5)	ANDW-08-03-002 (61.0-61.2)	ANDW-08-03-004 (124.60-124.80)	ANDW-08-03-007 (202.46-202.71)	ANDW08-04 (36.5-37)	ANDW08-04 (69-69.5)	ANDW08-04 (95-95.75)	ANDW-08-04 40.0-40.5	ANDW-08-04 60.0-60.5
pH, paste	---	7.37	7.16	7.44	7.75	9.1	7.38	7.54	6.7	7	7.26	6.74	7.56	7.78	7.6	7.5	7.7	7.58	7.78
Neutralizing Potential (NP)	g $CaCO_3$/kg	30.4	14.8	15	14.9	21.9	14.8	13.7	14.5	14.9	16.2	14.6	15.3	14.8	5	2	4	18.1	14.6
Acid Potential (NP)	g $CaCO_3$/kg	<0.5	0.7	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	0.9	0.3	<0.3	<0.3	<0.5	5.6
Net Acid Generation (NAG)	g $CaCO_3$/kg	-30.4	-14.1	-15	-14.9	-21.9	-14.3	-13.7	-14.5	-14.9	-16.2	-14.6	-14.2	-13.9	5	2	4	-18.1	-9
Ratio (NP:MPA)	---														16	12.8	25.6		
Total Sulphur	%	0.01	0.03	0.01	0.01	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.04	0.03	0.01	<0.01	<0.01	0.01	0.18
Sulphide-Sulphur	%	<0.01	0.02	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.03	0.01	<0.01	<0.01	<0.01	0.18
Sulphate-Sulphur (Carbonate Leach)	%														<0.01	<0.01	0.01		
Sulphate-Sulphur (HCl Leach)	%	0.022	0.024	0.003	0.003	0.023	0.042	0.005	0.002	0.008	0.002	0.005	0.015	0.007				0.016	0.002
Total Inorganic Carbon	%														<0.05	<0.05	<0.05		
CO_2	%														<0.2	<0.2	<0.2		

Parameter	Units	ANDW-08-04-005 (203.3-203.5)	ANDW-08-04-006 (227.50-227.78)	ANDW-08-04-007 (265.6-265.80)	ANDW08-05 (116.55-117)	ANDW08-05 (13-13.5)	ANDW08-05 (29.5-30)	ANDW08-05 (69-69.4)	ANDW-08-05-010 (318.64-318.90)	ANDW09-01 (135-136)	ANDW09-01 (175-176)	ANDW09-01 (20-21)	ANDW09-01 (222-222.9)	ANDW09-01 (299-300)	ANDW09-01 (323-324)	ANDW09-01 (75-76)
pH, paste	---	7.56	7.72	8.23	7.1	7.5	7.6	7.5	8.06	7.1	7.3	7.2	7.2	7.2	7.4	7.7
Neutralizing Potential (NP)	g $CaCO_3$/kg	14.7	20	3.9	3	2	3	1	4.9	2	3	13	2	7	4	6
Acid Potential (NP)	g $CaCO_3$/kg	1.5	<0.5	6.3	<0.3	0.3	<0.3	<0.3	0.9	3.1	0.3	<0.3	0.6	0.3	<0.3	0.3
Net Acid Generation (NAG)	g $CaCO_3$/kg	-13.2	-20	2.4	3	2	3	1	-4	-1	3	13	1	7	4	6
Ratio (NP:MPA)	---				19.2	6.4	19.2	6.4		0.64	9.6	83.2	3.2	22.4	25.6	19.2
Total Sulphur	%	0.05	0.01	0.21	<0.01	0.01	<0.01	<0.01	0.03	0.1	0.01	<0.01	0.02	0.01	<0.01	0.01
Sulphide-Sulphur	%	0.05	<0.01	0.2	<0.01	<0.01	<0.01	<0.01	0.03	0.09	<0.01	<0.01	0.02	0.01	<0.01	0.01
Sulphate-Sulphur (Carbonate Leach)	%				<0.01	0.01	<0.01	<0.01		0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulphate-Sulphur (HCl Leach)	%	0.004	0.011	0.025					0.005							
Total Inorganic Carbon	%				<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
CO_2	%				<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Table B12 –Center Zone core sample ABA results.

Parameter	Units	CZ07-01 (106-107)	CZ07-01 (13-14)	CZ07-01 (20-21)	CZ07-01 (49-50)	CZ07-01 (71.16-72.04)	CZ07-02 (101-102.05)	CZ07-02 (26-29)	CZ07-02 (44-44.95)	CZ07-02 (48.95-49.95)	CZ07-02 (95-95.85)	CZ08-01 (138-139)	CZ08-01 (171-172)	CZ08-01 (183-183.9)	CZ08-01 (193.92-195)	CZ08-01 (99-100)	CZ09-01 (108-109)	CZ09-01 (159-160)	CZ09-01 (19-20)	CZ09-01 (198-199)	CZ09-01 (239-240)	CZ09-01 (267-268)	CZ09-01 (60-61)
pH, paste	---	8.5	7.6	8	8.6	7.7	8	8.3	7.4	7.7	8	8.6	9	8.9	8.9	8.5	9	9	7.7	9	8.9	9	8
Neutralizing Potential (NP)	g $CaCO_3$/kg	13	8	8	7	5	10	9	11	13	10	18	33	45	20	10	19	20	6	24	12	33	2
Acid Potential (NP)	g $CaCO_3$/kg	0.9	<0.3	0.3	0.9	5	1.9	0.3	0.6	<0.3	1.3	14.4	33.8	57.2	51.3	0.6	24.4	26.3	0.3	25.3	15	30.6	28.4
Net Acid Generation (NAG)	g $CaCO_3$/kg	12	8	8	6	0	8	9	10	13	9	4	-1	-12	-31	9	-5	-6	6	-1	-3	2	-26
Ratio (NP:MPA)	---	13.87	51.2	25.6	7.47	1	5.33	28.8	17.6	83.2	8	1.25	0.98	0.79	0.39	16	0.78	0.76	19.2	0.95	0.8	1.08	0.07
Total Sulphur	%	0.03	<0.01	0.01	0.03	0.16	0.06	0.01	0.02	<0.01	0.04	0.46	1.08	1.83	1.64	0.02	0.78	0.84	0.01	0.81	0.48	0.98	0.91
Sulphide-Sulphur	%	0.03	<0.01	0.01	0.01	0.14	0.05	<0.01	<0.01	<0.01	0.02	0.43	1.03	1.79	1.6	0.02	0.77	0.83	<0.01	0.78	0.47	0.96	0.91
Sulphate-Sulphur (Carbonate Leach)	%	<0.01	<0.01	<0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.03	0.05	0.04	0.04	<0.01	0.01	0.01	0.02	0.03	0.01	0.02	<0.01
Sulphate-Sulphur (HCl Leach)	%																						
Total Inorganic Carbon	%	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.31	0.33	0.13	<0.05	0.11	0.08	<0.05	0.14	0.05	0.27	<0.05
CO_2	%	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	1.1	1.2	0.5	<0.2	0.4	0.3	<0.2	0.5	0.2	1	<0.2

Table B13 – End Grid core sample ABA results.

Parameter	Units	END07-01 (253.45-254)	END07-01 (98-98.5)	END08-01 (11.38-12)	END08-01 (141-141.55)	END08-01 (176.4-177)	END08-01 (59.4-60)	END08-01 (86.23-87)	END08-02 (131.5-132)	END08-02 (15-15.47)	END08-02 (190.9-192)	END08-02 (249-249.5)	END08-02 (35.5-36)	END-08-02-008 (240.64-240.86)	END-08-02-014 (418.22-418.43)	END08-03 (16.5-17)	END08-03 (21-21.5)	END08-03 (23.5-24)	END08-03 (29.5-30)
pH, paste	---	8.5	7.2	7.3	7.6	7.9	6.9	7.2	8	8.3	8.4	8.3	7.4	8.65	8.31	7.4	7.4	7.4	7.6
Neutralizing Potential (NP)	g $CaCO_3$/kg	22	6	2	2	9	2	0	71	4	49	39	2	5.6	15.9	1	2	2	2
Acid Potential (NP)	g $CaCO_3$/kg	35.3	0.6	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	<0.3	<0.3	<0.3	1.3	<0.5	<0.5	<0.3	<0.3	0.3	<0.3
Net Acid Generation (NAG)	g $CaCO_3$/kg	-13	5	2	2	9	2	0	71	4	49	39	1	-5.6	-15.9	1	2	2	2
Ratio (NP:MPA)	---	0.62	9.6	12.8	12.8	57.6	12.8	0	454.4	25.6	313.6	249.6	1.6			6.4	12.8	6.4	12.8
Total Sulphur	%	1.13	0.02	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.01	0.01	<0.01	<0.01	0.01	<0.01
Sulphide-Sulphur	%	1.12	0.02	<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
Sulphate-Sulphur (Carbonate Leach)	%	0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.05			0.01	0.01	<0.01	0.01
Sulphate-Sulphur (HCl Leach)	%													<0.001	0.002				
Total Inorganic Carbon	%	0.18	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	0.78	<0.05	0.56	0.5	<0.05			<0.05	<0.05	<0.05	<0.05
CO2	%	0.7	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	2.9	<0.2	2	1.8	<0.2			<0.2	<0.2	<0.2	<0.2

Parameter	Units	END08-03 (46.5-47)	END-08-03A-0012 (341.50-341.76)	END-08-03A-002 (60.0 60.25)	END-08-03A-004 (104.50-104.72)	END-08-03A-006 (159.70-159.90)	END-08-03A-008 (220.88-221.10)	ENDG-07-01 (140-140.5)	ENDG-07-01 (20-20.5)	ENDG-07-01 (215-215.5)	ENDG-07-01 (50-50.5)	ENDG-09-01 (269.5-270)	ENDG-09-02 (238-238.45)	ENDG-09-02 (320.5-321)	ENDG-09-02 (442.1-442.6)	ENDG-09-03 (195-195.5)	ENDG-09-03 (372-372.5)	ENDG-09-04 (205.1-205.6)	ENDG-09-04 (368.4-369)	ENDG-09-05 (297-297.5)	ENDG-09-06 (233.45-234)	ENDG-09-07 (114.42-114.92)	ENDG-09-08A (261-261.5)	ENDG-09-12 (361.6-362.2)	ENDG-09-13 (172.5-173)
pH, paste	---	7.3	8.52	8.06	8.31	8.5	8.5	7.9	7.7	8.7	7.8	7.9	8	8.2	8.9	8.3	8.3	7.3	8.6	8.5	8.3	7.4	8.4	8.3	7.8
Neutralizing Potential (NP)	g $CaCO_3$/kg	2	7.7	2.7	9.2	54	7.4	9.1	<4.5	<4.5	<4.5	17	39	7	22	15	7	3	23	82	28	7	32	5	8
Acid Potential (NP)	g $CaCO_3$/kg	<0.3	<0.5	1.8	<0.5	<0.5	<0.5	0.94	0.31	<0.31	4.69	0.6	0.6	0.3	5.6	0.3	0.6	0.3	3.4	3.8	1.3	0.6	0.3	0.6	1.6
Net Acid Generation (NAG)	g $CaCO_3$/kg	2	-7.7	-0.9	-9.2	-54	-7.4					16	38	7	16	15	6	3	20	78	27	6	32	4	6
Ratio (NP:MPA)	---	12.8										27.2	62.4	22.4	3.91	48	11.2	9.6	6.69	21.87	22.4	11.2	102.4	8	5.12
Total Sulphur	%	<0.01	0.01	0.06	0.01	0.01	0.01	0.03	0.01	<0.01	0.15	0.02	0.02	0.01	0.18	0.01	0.02	0.01	0.11	0.12	0.04	0.02	0.01	0.02	0.05
Sulphide-Sulphur	%	<0.01	<0.01	0.06	<0.01	0.01	<0.01					0.02	0.02	<0.01	0.16	0.01	0.02	0.01	0.11	0.12	0.03	0.02	0.01	0.02	0.05
Sulphate-Sulphur (Carbonate Leach)	%	<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	<0.01
Sulphate-Sulphur (HCl Leach)	%		0.003	0.007	0.007	<0.001	0.003	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01
Total Inorganic Carbon	%	<0.05						0.1	<0.05	<0.05	<0.05	0.14	0.42	<0.05	0.12	0.06	<0.05	<0.05	0.13	0.91	0.29	<0.05	0.29	<0.05	<0.05
CO2	%	<0.2						0.4	<0.2	<0.2	<0.2	0.5	1.5	<0.2	0.4	0.2	<0.2	<0.2	0.5	3.3	1.1	<0.2	1.1	<0.2	<0.2

Table B14 – Main Zone core sample ABA results continued.

Parameter	Units	MZ-07-01 (20-20.5)	MZ-07-01 (50-50.5)	MZ-07-01 (94-94.5)	MZ-07-01 (105-105.5)	MZ07-01 (13-13.5)	MZ07-01 (164-164.43)	MZ07-01 (209-209.56)	MZ07-01 (26-26.6)	MZ-07-03 (55-55.5)	MZ-07-03 (100-100.5)	MZ-07-03 (170-170.5)	MZ-07-03 (195-195.5)	MZ-07-04 (20-20.5)	MZ-07-04 (30-30.5)	MZ-07-04 (40-40.5)	MZ07-04 (7-7.5)	MZ07-04 (93.72-94.2)	MZ-07-05 (31-31.5)
pH, paste	---	7.9	7.9	7.2	7.8	8	8.2	8.5	8.5	8.9	8.7	7.5	7.5	7.5	7.7	8.1	7.8	9.2	8.2
Neutralizing Potential (NP)	g $CaCO_3$/kg	<4.5	<4.5	<4.5	<4.5	7	5	17	14	22.7	11.4	4.5	<4.5	4.5	4.5	4.5	10	12	34.1
Acid Potential (NP)	g $CaCO_3$/kg	19.06	0.31	1.25	<0.31	0.9	4.1	2.2	16.6	37.81	7.50	0.31	2.81	0.63	1.56	1.56	4.4	0.9	0.31
Net Acid Generation (NAG)	g $CaCO_3$/kg					6	1	15	-3								6	11	
Ratio (NP:MPA)	---					7.47	1.23	7.77	0.85								2.29	12.8	
Total Sulphur	%	0.61	0.01	0.04	<0.01	0.03	0.13	0.07	0.53	1.21	0.24	0.01	0.09	0.02	0.05	0.05	0.14	0.03	0.01
Sulphide-Sulphur	%					0.02	0.11	0.06	0.51					<0.01	0.01	0.01	0.1	0.02	
Sulphate-Sulphur (Carbonate Leach)	%					0.01	0.02	0.01	0.02					0.02	0.04	0.04	0.04	0.01	
Sulphate-Sulphur (HCl Leach)	%	<0.01	<0.01	<0.01	<0.01					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01
Total Inorganic Carbon	%	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.17	<0.05	0.27	0.13	0.05	<0.05	0.07	0.06	0.05	<0.05	0.07	0.4
CO2	%	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	<0.2	1	0.5	0.2	0.2	0.2	0.2	0.2	<0.2	0.3	1.5

Parameter	Units	MZ-07-05 (38-38.5)	MZ-07-05 (55-55.5)	MZ-08-02 (29.5-30.0)	MZ-08-02 (85.0-85.5)	MZ08-03 (10.48-11)	MZ08-03 (24-24.25)	MZ08-04 (151-151.5)	MZ08-04 (166.5-167.02)	MZ08-04 (211.5-211.84)	MZ08-04 (251.05-251.55)	MZ-08-04 (110.0-110.5)	MZ-08-04 (189.06-189.32)	MZ-08-04-005 (136.26-136.50)	MZ-08-04-006 (166.23-166.50)	MZ-08-04-008 (216.18-216.41)	MZ08-05 (129-129.5)	MZ08-05 (15-15.5)	MZ-08-05 (19.5-20.5)
pH, paste	---	7.6	7.9	7.98	7.96	9.1	9.1	8.5	8.6	8.5	8.7	7.56	8.57	8.62	8.76	8.81	8.5	8.7	8.5
Neutralizing Potential (NP)	g $CaCO_3$/kg	4.5	6.8	17	15	43	34	10	8	11	17	5.1	8.8	20.5	11.5	9.2	4	12	5.8
Acid Potential (NP)	g $CaCO_3$/kg	1.25	8.13	1.4	<0.5	9.1	13.8	9.4	0.6	4.7	8.8	<0.5	4.6	5.4	<0.5	9.4	8.8	20.3	<0.5
Net Acid Generation (NAG)	g $CaCO_3$/kg			-15.6	-15	34	20	1	7	6	8	-5.1	-4.2	-15.1	-11.5	<0.5	-5	-8	-5.8
Ratio (NP:MPA)	---					4.74	2.47	1.07	12.8	2.35	1.94						0.46	0.59	
Total Sulphur	%	0.04	0.26	0.05	0.01	0.29	0.44	0.3	0.02	0.15	0.28	0.02	0.15	0.18	0.01	0.31	0.28	0.65	0.01
Sulphide-Sulphur	%	0.01	0.21	0.04	<0.01	0.28	0.43	0.29	0.02	0.15	0.28	0.01	0.15	0.17	<0.01	0.3	0.27	0.63	<0.01
Sulphate-Sulphur (Carbonate Leach)	%	0.03	0.05			0.01	0.01	0.01	<0.01	<0.01	<0.01						0.01	0.02	
Sulphate-Sulphur (HCl Leach)	%	<0.01	<0.01	0.02	0.003							0.019	0.009	0.02	0.008	0.032			0.004
Total Inorganic Carbon	%	0.05	0.07			0.52	0.26	0.12	<0.05	0.11	0.08						<0.05	<0.05	
CO2	%	0.2	0.3			1.9	0.9	0.4	<0.2	0.4	0.3						<0.2	0.2	

Parameter	Units	MZ-08-05 (39.5-40.0)	MZ-08-05-004 (123.56-123.84)	MZ08-06 (72-72.3)	MZ08-06 (9-9.5)	MZ-08-06 (65.0-65.5)	MZ-08-06 (80.0-80.5)	MZ-08-07 (29.5-30.0)	MZ-08-07-001 (30.0-30.32)	MZ-08-16 (29.5-30.0)	MZ-09 03 (174.22-174.85)	MZ09-01A (200-201)	MZ09-01A (250.05-251.06)	MZ09-01A (25-26)	MZ09-01A (99.73-100.65)	MZ09-02 (101-102)	MZ09-02 (150-151)	MZ09-02 (50.91-51.94)	MZ09-03 (124.15-124.68)	MZ09-03 (74.5-75)
pH, paste	---	8.41	8.16	8.9	8.4	8.72	9.15	9.05	9.22	7.92	9.3	9	8.3	9.1	9	8	8.3	8.8	9.2	9.1
Neutralizing Potential (NP)	g $CaCO_3$/kg	8.5	3.8	17	11	26.3	27.4	13.9	18.3	7.7	15	20	44	26	15	11	41	27	22	34
Acid Potential (NP)	g $CaCO_3$/kg	7.3	9.1	20.6	4.4	9.2	19.9	21.6	22.1	18.4	11.6	10.3	9.4	26.6	51.6	50.3	14.7	36.3	2.8	18.4
Net Acid Generation (NAG)	g $CaCO_3$/kg	-1.2	5.3	-4	7	-17.1	-7.5	7.7	3.8	10.7	3	10	35	-1	-37	-39	26	-9	19	16
Ratio (NP:MPA)	---			0.82	2.51						1.3	1.94	4.69	0.98	0.29	0.22	2.79	0.74	7.82	1.84
Total Sulphur	%	0.24	0.31	0.66	0.14	0.3	0.65	0.7	0.72	0.61	0.37	0.33	0.3	0.85	1.65	1.61	0.47	1.16	0.09	0.59
Sulphide-Sulphur	%	0.23	0.29	0.65	0.14	0.29	0.64	0.69	0.71	0.59	0.36	0.3	0.27	0.82	1.61	1.58	0.45	1.13	0.07	0.57
Sulphate-Sulphur (Carbonate Leach)	%			0.01	<0.01						0.01	0.03	0.03	0.03	0.04	0.03	0.02	0.03	0.02	0.02
Sulphate-Sulphur (HCl Leach)	%	0.024	0.052			0.019	0.039	0.027	0.035	0.065										
Total Inorganic Carbon	%			0.08	<0.05						0.06	0.16	0.51	<0.05	<0.05	<0.05	0.43	0.19	0.08	0.31
CO2	%			0.3	<0.2						0.2	0.6	1.9	<0.2	<0.2	<0.2	1.6	0.7	0.3	1.1

Table B15 – EZ core sample ABA results.

Parameter	Units	EZ08-01 (39.15-39.21)	EZ08-01 (42-42.5)	EZ08-01 (44.9-45)	EZ08-01 (46.3-46.4)	EZ08-01 (48-48.1)	EZ08-01 (51-51.11)	EZ08-01 (53-53.1)	EZ08-01 (54.8-54.9)	EZ08-01 (57-57.53)	EZ08-01 (59-59.1)	EZ08-01 (61.04-61.14)	EZ08-01 (63-63.1)	EZ08-01 (64.96-65.06)	EZ08-01 (66.95-67.1)	EZ08-01 (68.5-69)	EZ08-01 (71.5-71.6)
pH, paste	---	8	7.5	7.6	7.5	7.6	8	8.1	8.7	8.9	9.2	9.5	9.3	9.3	9.1	9	8.7
Neutralizing Potential (NP)	g $CaCO_3$/kg	8	7	8	6	6	7	6	13	14	14	13	15	15	18	19	15
Acid Potential (NP)	g $CaCO_3$/kg	0.3	0.3	0.3	0.6	0.3	<0.3	<0.3	<0.3	4.4	6.9	5	18.1	6.3	6.9	3.4	3.4
Net Acid Generation (NAG)	g $CaCO_3$/kg	8	7	8	5	6	7	6	13	10	7	8	-3	9	11	16	12
Ratio (NP:MPA)	---	25.6	22.4	25.6	9.6	19.2	44.8	38.4	83.2	3.2	2.04	2.6	0.83	2.4	2.62	5.53	4.36
Total Sulphur	%	0.01	0.01	0.01	0.02	0.01	<0.01	<0.01	<0.01	0.14	0.22	0.16	0.58	0.2	0.22	0.11	0.11
Sulphide-Sulphur	%	0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.13	0.21	0.16	0.56	0.18	0.21	0.09	0.09
Sulphate-Sulphur (Carbonate Leach)	%	<0.01	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01	0.01	0.01	<0.01	0.02	0.02	0.01	0.02	0.02
Sulphate-Sulphur (HCl Leach)	%																
Total Inorganic Carbon	%	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	0.05	<0.05	0.07	<0.05	0.11	0.13	0.08
CO2	%	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	0.2	<0.2	0.3	<0.2	0.4	0.5	0.3

Table B16 – 2007 SWEP results for Main Zone core samples.

Sample ID	Units	MZ-07-01 (20-20.5)				MZ-07-01 (50-50.5)				MZ-07-01 (94-94.5)				MZ-07-01 (105-105.5)				MZ-07-03 (55-55.5)				MZ-07-03 (100-100.5)				MZ-07-03 (170-170.5)			
Leach Step		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Mass of Sample Added	kg	0.1801	0.2078	0.2092	0.2151	0.1802	0.2081	0.2208	0.2274	0.1801	0.2206	0.2220	0.2228	0.1802	0.2164	0.2220	0.2312	0.1802	0.2028	0.2093	0.2455	0.1805	0.2077	0.2165	0.2170	0.1801	0.2056	0.2197	0.2268
Volume Water Added	L	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.61	3.61	3.61	3.61	3.60	3.60	3.60	3.60
Volume Acid Added	L			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09
Total Volume Added	L	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69	3.61	3.61	3.70	3.70	3.60	3.60	3.69	3.69
pH of Added Acid	---			2.92	3.01			2.90	3.03			2.86	2.98			2.92	3.08			2.90	3.21			2.87	3.06			2.91	2.97
Total Mass	kg	4.02	4.01	4.11	4.12	3.99	4.02	4.17	4.10	3.99	4.03	4.18	4.13	3.99	3.99	4.18	4.11	4.02	4.02	4.15	4.17	3.99	4.02	4.17	4.11	3.99	4.00	4.17	4.13
Water:Solid Ratio	---	20	17	18	17	20	17	17	16	20	16	17	17	20	17	17	16	20	18	18	15	20	17	17	17	20	18	17	16
pH	---	6.08	5.67	2.80	2.71	7.64	6.54	2.75	2.72	6.03	6.07	2.84	2.76	6.03	6.03	2.78	2.72	7.97	5.79	2.78	2.74	6.40	5.41	2.74	2.78	6.45	5.73	2.79	2.67
Specific Conductance	mS/cm	0.00	0.00	0.39	0.41	0.00	0.00	0.43	0.43	0.00	0.00	0.38	0.47	0.00	0.00	0.42	0.47	0.01	0.00	0.36	0.35	0.00	0.00	0.41	0.40	0.00	0.00	0.35	0.43
Acidity (as $CaCO_3$)	mg/L	3	3	161	177	2	3	162	179	3	<2	154	176	3	2	170	181	<2	16	158	152	3	3	169	166	3	<2	160	160
Sulphate (SO_4)	mg/L	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30
Aluminum (Al)	mg/L	0.02	<0.01	0.2	0.1	0.05	0.02	0.1	<0.1	0.02	0.01	<0.1	<0.1	0.02	0.01	0.1	0.1	0.14	0.05	<0.1	<0.1	0.07	0.01	0.1	<0.1	0.03	0.01	0.2	0.1
Antimony (Sb)	mg/L	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05
Arsenic (As)	mg/L																												
Barium (Ba)	mg/L	<0.01	<0.01	<0.1	<0.1	0.02	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	0.1	<0.1
Beryllium (Be)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Boron (B)	mg/L	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001
Calcium (Ca)	mg/L	<0.05	<0.05	<5	<5	<0.05	<0.05	<5	<5	0.7	<0.05	5	<5	<0.05	<0.05	<5	<5	4.9	2.1	12	9	0.6	<0.05	<5	<5	<0.05	<0.05	6	<5
Chromium (Cr)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Cobalt (Co)	mg/L	<0.0005	<0.0005	0.007	0.006	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005
Copper (Cu)	mg/L			0.03	0.02													0.003		0.01				0.01				0.01	
Iron (Fe)	mg/L	<0.05	<0.05	1.8	1.7	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	0.5
Lead (Pb)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Magnesium (Mg)	mg/L	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5
Manganese (Mn)	mg/L	0.002	<0.001	0.06	0.04	0.002	0.002	0.06	0.06	0.002	<0.001	0.02	0.01	<0.001	<0.001	0.02	0.01	0.002	0.002	0.05	0.03	0.007	0.006	0.11	0.07	0.003	0.002	0.15	0.14
Molybdenum (Mo)	mg/L	0.003				0.002				0.004				0.001				0.002				0.005				0.009	0.002		
Nickel (Ni)	mg/L	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02
Phosphorus (P)	mg/L	<0.05	<0.05	51	53.2	<0.05	<0.05	50.7	52.2	<0.05	<0.05	49.8	51.3	<0.05	<0.05	50.9	51.1	<0.05	<0.05	54.3	49.2	<0.05	<0.05	51.7	54.6	<0.05	<0.05	50.8	53.6
Potassium (K)	mg/L	<1	<1	<10	<10	<1	<1	<10	<10	1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10
Selenium (Se)	mg/L	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05
Silicon (Si)	mg/L	0.4	0.1	<1	<1	0.5	0.2	1	1	0.5	0.2	2	<1	0.5	0.1	1	<1	0.4	0.1	<1	<1	0.2	<0.1	<1	<1	0.3	0.2	1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001
Sodium (Na)	mg/L	<0.5	<0.5	<5	<5	0.5	<0.5	<5	<5	1.5	<0.5	<5	<5	0.8	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	1	<0.5	<5	<5
Strontium (Sr)	mg/L	0.005	0.002	0.06	0.03	0.008	0.003	0.09	0.06	0.018	0.004	0.13	0.07	0.006	0.002	0.09	0.05	0.012	0.004	0.02	0.01	0.006	0.003	0.02	0.01	0.006	0.003	0.12	0.09
Sulphur (S)	mg/L	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003
Tin (Sn)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Titanium (Ti)	mg/L	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02
Tungsten (W)	mg/L	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1
Uranium (U)	mg/L					0.021	0.016	0.11		0.048	0.033	0.28	0.08	0.066	0.044	0.39	0.17												
Vanadium (V)	mg/L	<0.001	<0.001	<0.01	<0.01	0.004	0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	0.004	0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	0.003	0.001	<0.01	<0.01
Zinc (Zn)	mg/L																									0.004			
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04

Table B17 – 2007 SWEP results for Main Zone core samples continued.

Sample ID	Units	MZ-07-03 (195-195.5)				MZ-07-04 (20-20.5)				MZ-07-04 (30-30.5)				MZ-07-04 (40-40.5)				MZ-07-05 (31-31.5)				MZ-07-05 (38-38.5)				MZ-07-05 (55-55.5)			
Leach Step		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Mass of Sample Added	kg	0.1803	0.2184	0.2378	0.2214	0.1804	0.2223	0.2331	0.2367	0.1807	0.2065	0.2371	0.2229	0.1806	0.2107	0.2121	0.2143	0.1802	0.2174	0.2368	0.2292	0.1801	0.2155	0.2132	0.2146	0.1802	0.2356	0.2455	0.2866
Volume Water Added	L	3.60	3.60	3.60	3.60	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.61	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
Volume Acid Added	L			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09
Total Volume Added	L	3.60	3.60	3.69	3.69	3.61	3.61	3.70	3.70	3.61	3.61	3.70	3.70	3.61	3.61	3.70	3.70	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69
pH of Added Acid	---			2.90	3.03			2.98	3.12			2.98	2.93			3.02	2.89			2.99	3.14			3.00	3.09			3.00	3.12
Total Mass	kg	4.00	4.06	4.16	4.11	4.01	4.03	4.21	4.15	4.03	4.00	4.15	4.14	4.01	4.04	4.15	4.12	3.91	4.04	4.17	4.12	4.01	4.02	4.15	4.13	4.00	4.03	4.18	4.19
Water:Solid Ratio	---	20	16	16	17	20	16	16	16	20	17	16	17	20	17	17	17	20	17	16	16	20	17	17	17	20	15	15	13
pH	---	5.89	6.00	2.84	2.62	7.04	5.81	2.83	2.72	5.73	5.88	2.78	2.76	6.53	6.60	2.82	2.71	8.69	8.29	2.94	2.80	6.82	5.38	2.80	2.82	6.16	5.84	2.80	2.67
Specific Conductance	mS/cm	0.01	0.00	0.37	0.44	0.00	0.00	0.41	0.42	0.00	0.00	0.43	0.47	0.00	0.00	0.42	0.43	0.02	0.03	0.24	0.35	0.00	0.00	0.43	0.41	0.00	0.00	0.38	0.43
Acidity (as $CaCO_3$)	mg/L	3	<2	158	181	3	<2	171	176	3	3	166	175	3	3	174	176	NM	NM	133	155	4	<2	167	180	2	11	147	170
Sulphate (SO_4)	mg/L	6	<3	<30	<30	<3	<3	<30	<30	3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30
Aluminum (Al)	mg/L	0.03	0.01	0.2	0.1	0.02	0.01	0.3	0.1	0.04	0.02	0.2	<0.1	0.02	<0.01	0.1	<0.1	0.15	0.09	0.1	<0.1	0.03	0.02	0.1	0.1	0.07	0.02	<0.1	<0.1
Antimony (Sb)	mg/L	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05
Arsenic (As)	mg/L																												
Barium (Ba)	mg/L	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	0.02	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	0.01	<0.01	<0.1	<0.1
Beryllium (Be)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Boron (B)	mg/L	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001
Calcium (Ca)	mg/L	1	<0.05	<5	<5	<0.05	<0.05	<5	<5	0.6	<0.05	<5	<5	<0.05	<0.05	<5	<5	3.9	3.9	19	11	<0.05	<0.05	<5	<5	1.4	0.7	6	<5
Chromium (Cr)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Cobalt (Co)	mg/L	<0.0005	<0.0005	<0.005	<0.005	0.0006	0.0008	0.03	0.024	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005
Copper (Cu)	mg/L						0.002	0.15	0.1			0.01	0.01		0.002								0.002						
Iron (Fe)	mg/L	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	1.3	1.4	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5
Lead (Pb)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Magnesium (Mg)	mg/L	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	1	0.7	<5	<5	<0.5	<0.5	<5	<5	0.6	<0.5	<5	<5
Manganese (Mn)	mg/L	0.007	0.002	0.06	0.04	0.002	0.002	0.06	0.04	0.005	0.002	0.05	0.03	0.002	<0.001	0.03	0.02	<0.001	<0.001	0.06	0.03	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Molybdenum (Mo)	mg/L	0.008	0.002			0.03	0.006			0.005				0.014	0.002			0.004								0.011	0.001		
Nickel (Ni)	mg/L	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02
Phosphorus (P)	mg/L	<0.05	<0.05	52.4	55.3	<0.05	<0.05	49.8	50.6	<0.05	<0.05	50.4	54.5	<0.05	<0.05	49.9	55.1	<0.05	<0.05	49.3	53.2	<0.05	<0.05	50.5	55.3	<0.05	<0.05	48.9	53.4
Potassium (K)	mg/L	1	<1	<10	<10	<1	<1	<10	<10	1	<1	<10	<10	<1	<1	<10	<10	1	<1	<10	<10	<1	<1	<10	<10	2	<1	<10	<10
Selenium (Se)	mg/L	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05
Silicon (Si)	mg/L	0.5	0.2	1	<1	0.4	0.1	1	<1	0.5	0.2	1	<1	0.3	<0.1	<1	<1	1	0.4	<1	<1	0.4	0.1	1	<1	0.9	0.5	2	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001
Sodium (Na)	mg/L	1.4	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	0.9	<0.5	<5	<5
Strontium (Sr)	mg/L	0.019	0.004	0.07	0.03	0.005	0.003	0.06	0.05	0.013	0.004	0.07	0.04	0.004	0.001	0.06	0.03	0.013	0.009	0.03	0.02	<0.001	<0.001	0.02	0.01	0.014	0.008	0.07	0.05
Sulphur (S)	mg/L	2	<1	<10	<10	<1	<1	<10	<10	1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003
Tin (Sn)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Titanium (Ti)	mg/L	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02
Tungsten (W)	mg/L	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1
Uranium (U)	mg/L	0.257	0.184	0.81	0.28	0.015	0.014	0.16	0.06	0.038	0.033	0.31	0.14					0.067		0.32	0.09					0.042	0.017	0.08	
Vanadium (V)	mg/L	0.002	0.002	0.02	<0.01	<0.001	<0.001	<0.01	<0.01	0.004	0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	0.007	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	0.002	0.001	<0.01	<0.01
Zinc (Zn)	mg/L																												
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04

Table B18 – 2007 SWEP results for End Grid core samples.

Sample ID	Units	ENDG-07-01 (140-140.5)				ENDG-07-01 (20-20.5)				ENDG-07-01 (215-215.5)				ENDG-07-01 (50-50.5)			
Leach Step		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Mass of Sample Added	kg	0.1809	0.2158	0.2203	0.2201	0.1803	0.2153	0.2152	0.2186	0.1803	0.2085	0.2288	0.2223	0.1800	0.2090	0.2126	0.2310
Volume Water Added	L	3.61	3.61	3.61	3.61	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
Volume Acid Added	L			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09
Total Volume Added	L	3.61	3.61	3.70	3.70	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69
pH of Added Acid	---			2.95	3.18			2.86	3.19			2.99	2.96			2.88	3.22
Total Mass	kg	4.00	4.03	4.17	4.13	3.98	4.04	4.16	4.11	3.98	4.00	4.17	4.14	3.99	4.01	4.17	4.12
Water:Solid Ratio	---	20	17	17	17	20	17	17	17	20	17	16	17	20	17	17	16
pH	---	4.56	4.47	2.78	2.68	5.74	6.23	2.84	2.62	5.84	4.57	2.84	2.74	4.75	5.54	2.73	2.70
Specific Conductance	mS/cm	0.00	0.00	0.40	0.43	0.00	0.00	0.43	0.49	0.01	0.00	0.39	0.43	0.00	0.00	0.36	0.44
Acidity (as $CaCO_3$)	mg/L	3	3	164	176	<2	3	170	184	3	538	163	183	2	3	167	183
Sulphate (SO_4)	mg/L	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30
Aluminum (Al)	mg/L	0.03	0.02	0.2	0.1	0.04	0.03	0.2	<0.1	0.31	0.02	0.2	<0.1	0.02	0.01	<0.1	<0.1
Antimony (Sb)	mg/L	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05
Arsenic (As)	mg/L																
Barium (Ba)	mg/L	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	0.01	<0.01	<0.1	<0.1
Beryllium (Be)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Boron (B)	mg/L	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001
Calcium (Ca)	mg/L	<0.05	<0.05	<5	<5	<0.05	<0.05	<5	<5	2.1	0.6	5	<5	<0.05	<0.05	<5	<5
Chromium (Cr)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Cobalt (Co)	mg/L	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005
Copper (Cu)	mg/L														0.001	0.08	0.06
Iron (Fe)	mg/L	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	0.6	0.9
Lead (Pb)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Magnesium (Mg)	mg/L	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	0.6	<0.5	<5	<5	<0.5	<0.5	<5	<5
Manganese (Mn)	mg/L	<0.001	<0.001	0.01	0.01	0.002	0.001	0.02	<0.01	0.002	0.003	0.05	0.04	<0.001	<0.001	0.01	0.01
Molybdenum (Mo)	mg/L																
Nickel (Ni)	mg/L	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02
Phosphorus (P)	mg/L	<0.05	<0.05	50.7	51.5	<0.05	<0.05	50.8	52.3	<0.05	<0.05	51.7	52.5	<0.05	<0.05	50.8	52
Potassium (K)	mg/L	1	<1	<10	<10	1	<1	<10	<10	1	<1	<10	<10	<1	<1	<10	<10
Selenium (Se)	mg/L	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	0.009	<0.005	<0.05	<0.05
Silicon (Si)	mg/L	0.5	0.2	1	<1	0.6	0.2	<1	<1	1	0.1	<1	<1	0.4	<0.1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001
Sodium (Na)	mg/L	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5
Strontium (Sr)	mg/L	0.008	0.003	0.09	0.05	0.004	0.002	0.03	0.01	0.031	0.009	0.05	0.03	0.002	<0.001	0.03	0.02
Sulphur (S)	mg/L	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003
Tin (Sn)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Titanium (Ti)	mg/L	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02
Tungsten (W)	mg/L	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1
Uranium (U)	mg/L	0.006	0.005	0.1													
Vanadium (V)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Zinc (Zn)	mg/L	0.006															
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04

Table B19 – 2007 SWEP results for Andrew Lake core samples.

Sample ID	Units	BLANK				ANDW-07-01 (185-185.5)				ANDW-07-01 (200-200.5)				ANDW-07-01 (255-255.5)				ANDW-07-01 (50-50.5)				ANDW-07-01 (80-80.5)				ANDW-07-02 (26-26.5)				ANDW-07-02 (51-51.5)			
Leach Step		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Mass of Sample Added	kg	0.0000	0.0000	0.0000	0.0000	0.1804	0.2292	0.2360	0.2320	0.1801	0.2428	0.2206	0.2391	0.1801	0.2285	0.2354	0.2413	0.1802	0.2240	0.2400	0.2888	0.1805	0.2251	0.2549	0.2559	0.1801	0.2108	0.2248	0.2117	0.1801	0.2405	0.2272	0.2398
Volume Water Added	L	3.60	3.60	3.60	3.60	3.61	3.61	3.61	3.61	3.60	3.61	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.61	3.60	3.61	3.61	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
Volume Acid Added	L			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09			0.09	0.09
Total Volume Added	L	3.60	3.60	3.69	3.69	3.61	3.61	3.70	3.70	3.60	3.61	3.69	3.69	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69	3.61	3.60	3.70	3.70	3.60	3.60	3.69	3.69	3.60	3.60	3.69	3.69
pH of Added Acid	---			3.04	3.04			2.94	3.02			3.08	2.94			3.11	2.96			3.04	2.99			3.04	3.01			3.03	2.92			3.05	3.05
Total Mass	kg	3.99	3.99	4.09	4.02	4.01	4.05	4.18	4.14	4.00	4.04	4.14	4.14	4.01	4.04	4.18	4.15	3.99	4.04	4.18	4.20	4.01	3.99	4.19	4.13	3.99	4.04	4.16	4.13	4.01	4.05	4.16	4.16
Water:Solid Ratio	---					20	16	16	16	20	15	17	15	20	16	16	15	20	16	15	13	20	16	15	14	20	17	16	17	20	15	16	15
pH	---	3.23	6.27	2.80	2.69	4.99	6.84	2.83	2.72	5.60	6.40	2.83	2.65	6.09	6.00	2.80	2.73	6.20	6.08	2.80	2.73	7.02	6.14	2.84	2.76	6.27	5.39	2.80	2.72	5.84	5.70	2.84	2.70
Specific Conductance	mS/cm	0.00	0.00	0.47	0.41	0.00	0.00	0.38	0.41	0.38	0.00	0.39	0.39	0.19	0.00	0.38	0.38	0.00	0.00	0.39	0.45	0.00	0.00	0.37	0.42	0.00	0.00	0.38	0.40	0.00	0.00	0.39	0.40
Acidity (as $CaCO_3$)	mg/L	5	2	184	158	3	3	161	161	3	3	161	158	3	<2	162	152	3	2	163	176	3	3	160	158	3	2	171	138	2	3	165	161
Sulphate (SO_4)	mg/L	6	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30	<3	<3	<30	<30
Aluminum (Al)	mg/L	0.02	<0.01	<0.1	<0.1	0.03	0.02	0.3	0.1	<0.01	<0.01	<0.1	<0.1	<0.01	0.01	<0.1	0.1	0.02	0.02	0.1	0.1	0.07	0.02	0.1	<0.1	0.02	0.01	<0.1	<0.1	0.04	0.03	0.2	0.1
Antimony (Sb)	mg/L	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05
Arsenic (As)	mg/L																					0.003	0.002										
Barium (Ba)	mg/L	<0.01	0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	0.03	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1
Beryllium (Be)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Boron (B)	mg/L	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001
Calcium (Ca)	mg/L	<0.05	<0.05	<5	<5	1.8	<0.05	6	<5	53	1.7	7	<5	24.4	0.5	6	<5	<0.05	<0.05	5	<5	<0.05	<0.05	<5	<5	<0.05	<0.05	<5	<5	<0.05	<0.05	<5	<5
Chromium (Cr)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Cobalt (Co)	mg/L	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005
Copper (Cu)	mg/L	0.01	0.008							0.002	0.001	0.02															0.001						
Iron (Fe)	mg/L	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	0.5	<0.5	<0.05	<0.05	<0.5	<0.5	<0.05	<0.05	<0.5	<0.5
Lead (Pb)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	0.002	<0.001	0.03	0.02	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Magnesium (Mg)	mg/L	<0.5	<0.5	<5	<5	0.8	<0.5	<5	<5	5.2	<0.5	<5	<5	4.4	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5
Manganese (Mn)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	0.009	<0.001	0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	0.02	0.01
Molybdenum (Mo)	mg/L																																
Nickel (Ni)	mg/L	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	0.003	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02
Phosphorus (P)	mg/L	<0.05	<0.05	50	46.6	<0.05	<0.05	51.2	47	<0.05	<0.05	50.2	48.2	<0.05	<0.05	50.6	49.2	<0.05	<0.05	52.3	55.2	<0.05	<0.05	48	48	<0.05	<0.05	49.6	47.3	<0.05	<0.05	50.9	48
Potassium (K)	mg/L	<1	<1	<10	<10	3	<1	<10	<10	6	1	<10	<10	5	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10
Selenium (Se)	mg/L	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05	<0.005	<0.005	<0.05	<0.05
Silicon (Si)	mg/L	<0.1	<0.1	<1	<1	0.6	0.3	2	<1	0.2	0.2	1	<1	0.2	0.2	1	<1	0.3	0.1	1	<1	0.5	0.1	1	1	0.2	<0.1	<1	<1	0.5	0.2	1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001	<0.0001	<0.0001	<0.001	<0.001
Sodium (Na)	mg/L	<0.5	<0.5	<5	<5	0.7	<0.5	<5	<5	2.4	<0.5	<5	<5	1.9	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5	<0.5	<0.5	<5	<5
Strontium (Sr)	mg/L	<0.001	<0.001	<0.01	<0.01	0.034	0.003	0.11	0.05	0.422	0.014	0.06	0.04	0.307	0.008	0.08	0.05	<0.001	<0.001	0.05	0.03	0.002	<0.001	0.06	0.03	0.002	<0.001	0.03	0.02	<0.001	<0.001	0.03	0.02
Sulphur (S)	mg/L	2	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10	<1	<1	<10	<10
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003	<0.0003	<0.0003	<0.003	<0.003
Tin (Sn)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Titanium (Ti)	mg/L	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02	<0.002	<0.002	<0.02	<0.02
Tungsten (W)	mg/L	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	<0.01	<0.1	<0.1
Uranium (U)	mg/L					0.025	0.029	0.32	0.1	0.011	0.006	0.06																				0.08	
Vanadium (V)	mg/L	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01
Zinc (Zn)	mg/L					0.003				0.032	0.01	0.06		0.004	0.003																		
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04	<0.004	<0.004	<0.04	<0.04

Table B20 – 2009 SWEP results for Andrew Lake core samples.

Parameter	Units	ANDW-07-02 (51-51.5)	ANDW-07-01 (17-18.16)	ANDW-07-01 (51.5-53)	ANDW-07-01 (75.9-76.9)	ANDW-07-01 (80-80.5)	ANDW-07-01 (91-92)	ANDW-07-01 (200-200.5)	ANDW-07-02 (31-31.96)	ANDW-07-02 (44-44.47)	ANDW-08-01 (17.5-18)	ANDW-08-01 (28.6-29.1)	ANDW-08-01 (49.1-49.6)	ANDW-08-01 (72.72.5)	ANDW-08-01 (215.0-215.5)	ANDW-08-01 (25.0-25.5)	ANDW-08-01 (50.0-50.5)	ANDW-08-01 (75.0-75.5)	ANDW-08-01-007 (214.75-215.0)	ANDW-08-01-008 (249.0-249.2)	ANDW-08-03 (110.0-110.5)	ANDW-08-03 (190.0-190.5)	ANDW-08-03 (30.0-30.5)	ANDW-08-03 (60.0-60.5)	ANDW-08-03 (80.0-80.5)
Waste Rock Type																									
Sample Mass	g	250.51	131.14	133.43	131.15	250.32	133.85	250.17	132.35	130.21	130.97	130.88	131.24	130.66	105.81	104.36	105.20	100.23	102.02	103.17	101.44	102.06	102.53	102.26	102.40
Water Added Mass	g	751.50	401.63	400.96	400.68	750.90	400.73	750.50	400.12	401.46	400.47	400.27	400.84	400.95	303.72	304.72	302.58	302.81	306.74	303.23	301.19	303.70	302.28	302.70	301.04
pH	--	6.81	6.52	7.25	5.66	6.63	6.97	6.37	4.82	5.26	6.57	6.55	5.81	6.58	5.77	6.34	5.72	6.44	5.41	6.45	6.03	6.27	5.10	6.05	5.60
Conductivity	mS/cm	0.00				0.02		2.73							0.18	0.11	0.15	0.04	0.14	0.11	0.14	0.09	0.05	0.07	0.10
Acidity (as $CaCO_3$)	mg/L	2	2.2	<2.0	2.6	4	8.2	5	21.6	2.0	20.6	2.6	2.6	8.0	6.3	5.1	5.1	4.9	6.7	5.3	6.3	5.5	8	11.8	5
Sulphate (SO_4)	mg/L	<30	<3.0	<3.0	<3.0	<30	<3.0	6	<3.0	<3.0	<3.0	<3.0	6.3	<3.0	<3	35.1	51	<3	<3	21.9	56.7	<3	<3	18.6	3.6
Aluminum (Al)	mg/L	3.8	0.066	0.040	0.011	1.6	0.171	<0.01	0.016	0.079	0.011	0.116	0.363	0.027	0.08	0.113	0.028	0.08	0.072	0.501	0.023	0.072	0.049	<0.010	0.068
Antimony (Sb)	mg/L	<0.05	<0.0050	<0.0050	<0.0050	<0.05	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	<0.01	<0.0010	0.0013	<0.0010	<0.01	0.0037	<0.001	0.0013	<0.0010	0.0015	<0.0010	<0.0010	<0.0010	0.0038	<0.001	0.0011	0.0023	0.004	<0.001	<0.001	0.0019	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	<0.1	<0.010	<0.010	<0.010	<0.1	<0.010	0.14	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	0.052	0.016	<0.010	<0.010	0.083	0.051	<0.010	<0.010	<0.010	0.02
Beryllium (Be)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.01	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.01	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.5	<0.050	<0.050	<0.050	<0.5	<0.050	0.22	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.234	0.167	0.148	0.066	0.132	<0.050	0.219	0.349	0.328	0.135	0.162
Cadmium (Cd)	mg/L	<0.001	<0.00010	<0.00010	<0.00010	<0.001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00015	<0.0001	0.00011	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	<5	<0.50	<0.50	<0.50	<5	3.41	492	<0.50	<0.50	0.63	<0.50	<0.50	<0.50	11.2	8.91	10.3	0.83	9.2	12.7	19.1	4.22	0.64	3.27	4.08
Chromium (Cr)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.01	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0015
Cobalt (Co)	mg/L	<0.005	<0.00050	<0.00050	<0.00050	<0.005	<0.00050	0.0007	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (Cu)	mg/L	<0.01	0.0014	<0.0010	<0.0010	<0.01	<0.0010	0.003	<0.0010	0.0039	<0.0010	0.0027	0.0026	<0.0010	0.0024	0.0028	0.001	<0.001	0.0019	0.0024	0.0014	0.0074	0.0011	0.0012	0.0026
Iron (Fe)	mg/L	<0.5	<0.050	<0.050	<0.050	0.7	<0.050	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.01	<0.0010	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	<5	<0.50	<0.50	<0.50	<5	1.19	39.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	3.93	4.36	4.16	<0.5	2.67	1.76	6.93	1.81	<0.5	1.39	1.52
Manganese (Mn)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.01	<0.0010	0.029	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.001	0.0161	0.0015	0.0049	0.0025	0.0086	0.0038	0.0026	0.0106	0.0017
Molybdenum (Mo)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.01	0.0044	0.002	<0.0010	<0.0010	0.0024	0.0011	0.0011	<0.0010	0.0028	0.0141	0.0104	0.0053	0.0199	0.0357	0.0021	0.0106	<0.001	0.0014	<0.001
Nickel (Ni)	mg/L	<0.02	<0.0020	<0.0020	<0.0020	<0.02	<0.0020	0.018	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	0.0024	<0.002	0.0033	<0.002	<0.002	<0.002	0.0021
Phosphorus (P)	mg/L	<0.5	0.050	<0.050	<0.050	<0.5	<0.050	<0.05	<0.050	0.099	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.066	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)	mg/L	<10	<1.0	1.4	1.0	<10	2.5	40	<1.0	<1.0	2.0	2.3	2.4	1.3	23.7	18.3	23.3	6.8	17.5	5.5	17.3	14.7	4.4	8.9	14.2
Selenium (Se)	mg/L	<0.05	<0.0050	<0.0050	<0.0050	<0.05	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	9	0.42	0.47	0.27	4	0.29	1.3	0.13	0.55	0.21	0.74	1.13	0.28	3.76	2.22	4.23	2.89	5.54	2.08	2.29	5.57	3.85	2.15	1.43
Silver (Ag)	mg/L	<0.001	<0.00010	<0.00010	<0.00010	<0.001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	<5	0.77	1.09	1.03	<5	0.80	19.3	1.98	5.77	1.39	6.35	10.1	1.95	5.32	5.5	3.13	1.71	3.79	2.3	3.3	3.17	3.53	2.32	5.31
Strontium (Sr)	mg/L	<0.01	0.0015	0.0021	<0.0010	0.01	0.0332	3.04	0.0014	<0.0010	0.0122	0.0043	0.0023	0.0018	0.229	0.1	0.0876	0.009	0.174	0.221	0.317	0.0935	0.0022	0.0223	0.048
Sulfur (S)	mg/L	<10	<1.0	<1.0	<1.0	<10	<1.0	2	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	<1.0	11.7	17	<1.0	<1.0	7.3	18.9	<1.0	<1.0	6.2	1.2
Thallium (Tl)	mg/L	<0.003	<0.00030	<0.00030	<0.00030	<0.003	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.01	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.02	<0.0020	<0.0020	<0.0020	<0.02	<0.0020	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0034	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<0.1	<0.010	<0.010	<0.010	<0.1	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	<0.010	<0.010	<0.010
Uranium (U)	mg/L	<0.05	<0.0050	<0.0050	<0.0050	<0.05	<0.0050	0.063	<0.0050	0.0066	<0.0050	<0.0050	<0.0050	<0.0050	0.0901	<0.005	<0.005	0.0082	0.0363	<0.005	0.246	<0.005	<0.005	<0.005	<0.005
Vanadium (V)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.01	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0026	0.0032	<0.001	<0.001	0.0033	0.0029	0.0051	<0.001	0.0015	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.03	<0.0030	<0.0030	<0.0030	<0.03	<0.0030	0.037	<0.0030	0.0046	<0.0030	<0.0030	<0.0030	<0.0030	0.0208	0.0035	0.006	0.0046	0.0154	0.0036	<0.003	0.0094	0.005	0.0073	0.0172
Zirconium (Zr)	mg/L	<0.04	<0.0040	<0.0040	<0.0040	<0.04	<0.0040	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Table B21 – 2009 SWEP results for Andrew Lake core samples continued.

Parameter	Units	ANDW-08-03-002 (61.0-61.2)	ANDW-08-03-004 (124.6-124.8)	ANDW-08-03-007 (202.46-202.71)	ANDW-08-04 (36.5-37)	ANDW-08-04 (69-69.5)	ANDW-08-04 (95-95.75)	ANDW-08-04 (40.0-40.5)	ANDW-08-04 (60.0-60.5)	ANDW-08-04-005 (203.3-203.5)	ANDW-08-04-006 (227.50-227.78)	ANDW-08-04-007 (265.6-265.8)	ANDW-08-05 (116.55-117)	ANDW-08-05 (13-13.5)	ANDW-08-05 (29.5-30)	ANDW-08-05 (69-69.4)	ANDW-08-05-010 (318.64-318.90)	ANDW-09-01 (135-136)	ANDW-09-01 (175-176)	ANDW-09-01 (20-21)	ANDW-09-01 (222-222.9)	ANDW-09-01 (222-222.9) Duplicate	ANDW-09-01 (299-300)	ANDW-09-01 (323-324)	ANDW-09-01 (75-76)
Waste Rock Type																									
Sample Mass	g	100.09	100.71	100.23	130.46	131.14	131.19	100.40	104.90	100.98	100.45	101.23	131.95	130.93	130.08	131.92	103.70	131.76	132.63	130.10	132.66	130.72	132.11	130.54	135.20
Water Added Mass	g	303.05	300.15	301.19	400.43	400.07	401.08	301.96	305.31	300.22	301.26	303.36	400.63	401.35	401.42	400.20	302.71	400.45	405.49	400.66	400.44	401.67	400.60	400.72	400.56
pH	--	4.42	5.94	5.44	5.47	6.85	5.94	5.89	5.95	3.56	5.69	6.28	5.33	5.63	5.50	5.88	6.37	5.83	5.79	5.55	5.65	5.37	5.63	5.88	5.79
Conductivity	mS/cm	0.15	0.09	0.08				0.10	0.08	0.24	0.15	0.09					0.61								
Acidity (as $CaCO_3$)	mg/L	11.1	6	5.1	38.2	<2.0	2.4	4.2	6.8	9.4	7.3	6.1	2.4	2.0	2.0	<2.0	6.5	4.4	3.8	9.0	2.4	<2.0	2.2	28.6	2.6
Sulphate (SO_4)	mg/L	20.1	5.7	<3	16.5	<3.0	<3.0	13.8	<3	29.7	<3	3.6	<3.0	<3.0	<3.0	<3.0	4.2	5.7	<3.0	<3.0	3.9	6.0	<3.0	<3.0	<3.0
Aluminum (Al)	mg/L	0.037	0.034	0.081	0.012	0.018	0.082	0.039	0.179	0.034	0.075	0.078	0.042	0.128	0.026	0.038	0.046	0.033	0.016	0.045	0.051	0.081	<0.010	0.012	<0.010
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Arsenic (As)	mg/L	<0.001	0.0047	0.0024	<0.0010	0.0011	0.0014	0.0011	0.0014	0.0029	0.0029	0.0033	<0.0010	0.0043	<0.0010	<0.0010	0.0045	<0.0010	0.0018	0.0023	<0.0010	<0.0010	0.0023	0.0013	0.0011
Barium (Ba)	mg/L	0.011	0.012	<0.010	0.030	<0.010	<0.010	0.027	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	0.010	0.011	0.014	0.032	<0.010	<0.010	<0.010	0.037	<0.010	<0.010
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	mg/L	0.198	0.264	0.176	<0.050	<0.050	<0.050	0.094	0.143	0.281	0.254	0.082	<0.050	<0.050	<0.050	<0.050	0.19	0.078	0.102	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cadmium (Cd)	mg/L	<0.0001	<0.0001	0.00012	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	0.00015	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	0.00018	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium (Ca)	mg/L	4.96	6.5	5.01	3.04	<0.50	2.26	2.73	1.84	10.4	9.31	4.39	0.99	1.22	<0.50	1.40	75.2	1.73	6.15	0.53	1.29	1.79	26.9	8.54	<0.50
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	mg/L	0.00112	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	0.00122	<0.00050	0.00145	<0.00050	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)	mg/L	0.0046	0.0044	0.0024	<0.0010	0.0029	0.0176	0.0017	0.0089	<0.001	0.0081	0.0024	<0.0010	0.0034	0.0092	0.0014	0.0023	<0.0010	0.0039	<0.0010	0.0019	<0.0010	<0.0010	<0.0010	<0.0010
Iron (Fe)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)	mg/L	<0.001	<0.001	0.0015	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium (Mg)	mg/L	1.92	2.43	1.96	1.84	<0.50	1.20	1.59	0.8	3.94	3.15	1.69	0.58	<0.50	<0.50	0.66	9.07	0.83	3.03	<0.50	0.56	0.79	6.87	2.15	<0.50
Manganese (Mn)	mg/L	0.0112	0.0013	0.0035	0.0013	<0.0010	<0.0010	0.0049	0.0071	0.0044	0.0018	0.0032	0.0018	0.0018	<0.0010	0.0012	0.01	<0.0010	0.0018	0.0020	0.0022	0.0030	0.0022	<0.0010	<0.0010
Molybdenum (Mo)	mg/L	0.0015	0.0085	0.0051	<0.0010	<0.0010	<0.0010	0.0058	0.0139	0.0094	0.0209	0.0312	<0.0010	<0.0010	0.0014	<0.0010	0.0356	0.0161	0.0215	0.0014	<0.0010	<0.0010	0.0010	<0.0010	<0.0010
Nickel (Ni)	mg/L	0.0047	0.0027	0.0069	0.0022	<0.0020	<0.0020	0.0025	<0.002	0.0031	0.0022	0.0034	<0.0020	0.0049	<0.0020	<0.0020	0.0072	<0.0020	0.0027	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)	mg/L	<0.050	<0.050	<0.050	<0.050	0.064	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.114	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.311	<0.050	<0.050	<0.050	<0.050	0.072
Potassium (K)	mg/L	9.3	11.9	11.5	2.9	<1.0	3.4	6.9	12.2	15.7	15.5	8.2	1.8	1.9	<1.0	2.4	23.5	4.7	5.2	1.3	1.5	1.8	7.2	3.6	<1.0
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0059	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)	mg/L	2.22	3.14	3.7	0.39	0.28	0.91	2.88	5.24	4.24	3.44	2.51	0.58	0.42	0.32	0.51	3.3	1.24	1.53	1.17	0.59	0.96	0.57	0.32	0.25
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	mg/L	3.36	3.38	3.68	4.50	1.09	4.19	3.46	2.46	4.04	4.67	3.31	1.67	0.85	0.56	2.60	23.8	4.18	7.76	3.54	1.42	1.91	10.2	4.63	1.17
Strontium (Sr)	mg/L	0.0328	0.128	0.115	0.0207	0.0049	0.0284	0.0227	0.0198	0.208	0.171	0.0855	0.0144	0.0216	0.0023	0.0189	2.02	0.0354	0.107	0.0058	0.0281	0.0382	0.717	0.241	<0.0010
Sulfur (S)	mg/L	6.7	1.9	<1.0	5.5	<1.0	<1.0	4.6	<1.0	9.9	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	1.4	1.9	<1.0	<1.0	1.3	2.0	<1.0	<1.0	<1.0
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.00030	<0.00030	<0.00030	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tungsten (W)	mg/L	<0.010	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L	<0.005	0.106	0.137	<0.0050	0.0080	0.0234	0.0051	<0.005	0.116	1.28	0.0133	<0.0050	0.0148	<0.0050	<0.0050	0.0452	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Vanadium (V)	mg/L	<0.001	0.0091	0.0021	<0.0010	<0.0010	0.0020	0.0022	0.0018	0.0096	0.0105	0.0018	0.0010	0.0013	<0.0010	0.0010	0.0026	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	mg/L	0.0115	0.0091	0.0113	<0.0030	<0.0030	<0.0030	0.0448	0.0242	0.0137	0.008	0.0072	<0.0030	<0.0030	<0.0030	<0.0030	0.0094	<0.0030	0.0061	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.0040	<0.0040	<0.0040	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Table B22 – 2009 SWEP results for Center Zone core samples.

Parameter	Units	CZ-07-01 (106-107)	CZ-07-01 (13-14)	CZ-07-01 (20-21)	CZ-07-01 (49-50)	CZ-07-01 (71.16-72.04)	CZ-07-02 (101-102.5)	CZ-07-02 (26-29)	CZ-07-02 (44-44.95)	CZ-07-02 (48.95-49.95)	CZ-07-02 (95-95.85)	CZ-08-01 (138-139)	CZ-08-01 (171-172)	CZ-08-01 (183-183.9)	CZ-08-01 (193.92-195)	CZ-08-01 (99-100)	CZ-08-01D (183-183.9)	CZ-09-01 (108-109)	CZ-09-01 (159-160)	CZ-09-01 (19-20)	CZ-09-01 (198-199)	CZ-09-01 (239-240)	CZ-09-01 (267-268)	CZ-09-01 (60-61)	CZ-09-01D (239-240)
Waste Rock Type																									
Sample Mass	g	130.54	130.49	133.40	130.99	130.61	132.27	130.66	130.72	130.87	131.15	130.98	130.61	131.37	130.74	132.00	130.74	133.04	130.90	130.96	132.06	132.19	133.27	130.53	130.44
Water Added Mass	g	400.77	400.33	400.42	401.37	401.03	400.58	401.24	400.18	400.38	400.42	402.35	400.35	400.35	401.75	400.98	400.32	400.08	401.53	400.40	400.08	400.46	400.98	401.33	401.00
pH	--	6.55	4.74	6.02	5.87	5.88	5.38	7.25	6.28	6.07	7.04	7.58	7.80	5.78	7.21	6.92	7.92	6.60	5.49	6.91	5.29	8.10	7.88	7.41	7.24
Conductivity	mS/cm																								
Acidity (as $CaCO_3$)	mg/L	2.6	2.4	3.2	3.2	2.6	18.4	<2.0	3.2	2.8	2.6	N/A	N/A	9.8	<2.0	4.6	N/A *	<2.0	15.2	2.4	12	N/A *	N/A *	2	2.6
Sulphate (SO_4)	mg/L	<3.0	<3.0	<3.0	<3.0	15.0	<3.0	<3.0	5.1	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.3	<3.0
Aluminum (Al)	mg/L	0.033	<0.010	0.017	0.061	0.055	0.042	0.076	0.063	0.042	0.030	0.337	0.259	0.451	0.263	0.018	0.378	0.449	0.298	0.017	0.241	0.202	0.297	0.015	0.166
Antimony (Sb)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Arsenic (As)	mg/L	<0.0010	<0.0010	0.0017	0.0059	0.0194	0.0043	0.013	<0.0010	0.0012	0.0028	0.0013	0.004	0.0012	<0.0010	0.0085	0.0032	<0.0010	0.0022	<0.0010	0.0029	0.0012	0.0013	0.004	0.0029
Barium (Ba)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.011
Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.069	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cadmium (Cd)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium (Ca)	mg/L	<0.50	1.24	<0.50	<0.50	1.01	<0.50	<0.50	0.81	<0.50	<0.50	3.36	4.72	5.87	4.56	<0.50	5.25	5.36	5.03	<0.50	5.13	4.83	4.96	<0.50	2.67
Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)	mg/L	<0.0010	<0.0010	0.0316	0.0044	0.0053	0.0012	0.0046	0.0021	<0.0010	<0.0010	0.0024	0.0024	0.0011	<0.0010	<0.0010	0.0034	<0.0010	0.0012	0.0034	0.0014	0.0023	0.0016	0.0026	0.0014
Iron (Fe)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0030	<0.0010	<0.0010	0.0031	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium (Mg)	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.68	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese (Mn)	mg/L	<0.0010	0.0017	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	0.0013	<0.0010	0.001	0.0026
Molybdenum (Mo)	mg/L	0.0023	0.0060	0.0078	0.0243	0.0515	0.0093	0.0066	0.0014	0.0011	0.0094	0.0157	0.0022	0.0193	0.0160	0.0029	0.0604	0.0010	0.0018	0.002	0.004	0.0012	0.0022	0.0033	0.001
Nickel (Ni)	mg/L	<0.0020	<0.0020	<0.0020	0.0026	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)	mg/L	<0.050	0.057	0.073	0.082	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)	mg/L	<1.0	1.7	<1.0	<1.0	2.5	<1.0	<1.0	2.2	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0
Selenium (Se)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)	mg/L	0.45	0.43	0.30	0.29	0.89	0.32	0.3	0.99	0.38	0.48	0.71	0.55	0.81	0.71	0.42	0.79	0.98	0.63	0.54	0.45	0.62	0.57	0.41	0.54
Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	mg/L	3.25	3.72	2.19	5.70	8.48	1.63	3.6	12.2	3.54	2.69	0.84	<0.50	0.88	1.43	1.04	1.35	0.52	0.51	1.54	<0.50	<0.50	0.54	1.48	<0.50
Strontium (Sr)	mg/L	<0.0010	0.0136	<0.0010	0.0013	0.0084	0.0022	<0.0010	0.0054	<0.0010	0.0016	0.0488	0.0329	0.0577	0.103	0.0059	0.0916	0.0492	0.14	0.0014	0.0821	0.0646	0.111	0.0087	0.0565
Sulfur (S)	mg/L	<1.0	<1.0	<1.0	<1.0	5.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.00
Thallium (Tl)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tungsten (W)	mg/L	<0.010	<0.010	<0.010	<0.010	0.026	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L	<0.0050	<0.0050	<0.0050	0.144	0.140	<0.0050	0.0272	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0154	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Vanadium (V)	mg/L	0.0013	<0.0010	0.0015	0.0041	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	0.0035	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium (Zr)	mg/L	<0.0040	<0.0040	<0.0040	0.0123	0.0165	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Table B23 – 2009 SWEP results for End Grid core samples.

Parameter	Units	ENDG-07-01 (215-215.5)	END-07-01 (253.45-254)	END-07-01 (98-98.5)	END-08-01 (11.38-12)	END-08-01 (141-141.55)	END-08-01 (176.4-177)	END-08-01 (59.4-60)	END-08-01 (86.23-87)	END-08-01D (59.4-60)	END-08-02 (131.5-132)	END-08-02 (15-15.47)	END-08-02 (190.9-192)	END-08-02 (249-249.5)	END-08-02 (35.5-36)	END-08-02-008 (240.64-240.86)	END-08-02-014 (418.22-418.43)	END-08-03 (16.5-17)	END-08-03 (21-21.5)	END-08-03 (23.5-24)	END-08-03 (29.5-30)	END-08-03 (46.5-47)
Waste Rock Type																						
Sample Mass	g	249.99	130.47	131.43	132.73	130.11	131.91	130.35	131.77	130.59	130.42	132.04	133.52	132.79	132.29	101.16	100.66	130.87	130.46	130.78	131.02	131.54
Water Added Mass	g	749.97	400.42	400.91	401.43	403.15	400.32	401.77	400.12	400.95	400.48	401.36	401.29	401.79	400.30	304.59	301.59	400.07	400.12	400.29	401.00	401.68
pH	--	7.68	5.54	5.37	6.60	3.03	2.79	5.18	6.60	2.94	5.09	8.13	7.01	7.71	2.68	6.85	6.08	5.45	5.34	5.29	5.57	4.67
Conductivity	mS/cm	0.09														0.10	0.14					
Acidity (as $CaCO_3$)	mg/L	3	20.6	16.6	<2.0	22.6	24.6	2.4	2.4	37.4	23.8	<2.0	<2.0	<2.0	33.4	4.7	6.3	<2.0	<2.0	2.6	2.2	58.2
Sulphate (SO_4)	mg/L	<30	3.6	<3.0	<3.0	<3.0	<3.0	<3.0	5.7	<3.0	<3.0	11.1	<3.0	<3.0	12.6	<3	<3	<3.0	<3.0	<3.0	<3.0	<3.0
Aluminum (Al)	mg/L	4.1	0.129	0.012	0.162	0.144	0.494	<0.010	<0.010	0.109	0.205	0.190	0.264	0.159	0.206	0.212	0.286	0.014	0.018	0.013	0.011	0.159
Antimony (Sb)	mg/L	<0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Arsenic (As)	mg/L	<0.01	<0.0010	<0.0010	0.0013	0.0054	0.0354	0.0012	0.0255	0.290	0.0089	0.0053	0.0057	0.0024	0.0173	0.003	0.0014	0.0048	0.0014	0.0012	0.0011	0.0121
Barium (Ba)	mg/L	<0.1	<0.010	0.159	<0.010	0.014	0.010	0.042	<0.010	0.028	0.020	0.016	<0.010	0.014	0.035	0.021	0.014	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	mg/L	<0.5	<0.050	<0.050	<0.050	0.496	0.432	0.165	0.241	0.163	0.335	<0.050	0.118	0.133	0.181	0.569	0.875	<0.050	<0.050	<0.050	<0.050	<0.050
Cadmium (Cd)	mg/L	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	0.00022	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	0.00013	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium (Ca)	mg/L	10	1.09	26.8	0.72	1.40	1.04	9.68	2.73	6.49	2.05	16.7	0.63	1.31	2.27	1.52	0.58	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium (Cr)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	<0.0010	<0.0010	<0.0010	<0.001	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	mg/L	<0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)	mg/L	<0.01	<0.0010	<0.0010	0.0072	0.0034	0.0028	0.0027	0.0054	0.0023	0.0019	<0.0010	0.0019	<0.0010	0.0040	0.0022	0.002	<0.0010	0.0011	0.0013	0.0013	<0.0010
Iron (Fe)	mg/L	<0.5	<0.050	<0.050	0.066	<0.050	0.079	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	0.0208	0.0014	<0.0010	<0.0010	0.0029	<0.0010	<0.0010	<0.0010	<0.0010	0.0026	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium (Mg)	mg/L	<5	<0.50	5.47	<0.50	0.56	<0.50	4.24	1.23	2.68	0.86	1.56	<0.50	<0.50	1.00	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese (Mn)	mg/L	<0.01	<0.0010	0.0374	0.0150	<0.0010	<0.0010	0.0046	0.0010	0.0038	<0.0010	<0.0010	0.0019	<0.0010	0.0014	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Molybdenum (Mo)	mg/L	<0.01	0.0170	<0.0010	<0.0010	0.0013	0.0652	<0.0010	0.0017	<0.0010	0.0019	<0.0010	0.0033	0.0099	<0.0010	0.0122	0.0374	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)	mg/L	<0.02	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)	mg/L	<0.5	<0.050	<0.050	0.062	0.053	0.070	<0.050	<0.050	<0.050	0.067	<0.050	<0.050	<0.050	0.074	0.055	<0.050	<0.050	<0.050	<0.050	<0.050	0.083
Potassium (K)	mg/L	10	2.4	7.3	1.1	5.2	4.5	9.8	7.2	9.3	5.5	4.1	3.3	4.7	5.3	12	6.1	<1.0	1	<1.0	<1.0	1.3
Selenium (Se)	mg/L	<0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)	mg/L	11	0.36	0.27	1.20	1.29	1.89	1.14	2.16	1.51	1.20	7.63	0.64	0.75	1.65	3.03	3.4	0.24	0.25	0.24	0.19	0.67
Silver (Ag)	mg/L	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	mg/L	<5	2.68	7.92	1.47	6.59	6.90	5.4	3.21	6.12	2.84	1.37	3.50	5.94	3.50	14	25.1	0.76	1.49	1.07	0.93	3.22
Strontium (Sr)	mg/L	0.16	0.0243	0.187	0.0099	0.0418	0.0283	0.152	0.0710	0.0990	0.0598	0.152	0.0179	0.0354	0.0330	0.041	0.011	0.0035	0.0055	<0.0010	<0.0010	0.0036
Sulfur (S)	mg/L	<10	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	1.9	<1.00	<1.0	3.7	<1.0	<1.0	4.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Thallium (Tl)	mg/L	<0.003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tin (Sn)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	mg/L	<0.02	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tungsten (W)	mg/L	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.088	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L	<0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Vanadium (V)	mg/L	<0.01	<0.0010	<0.0010	<0.0010	0.0020	0.0028	<0.0010	0.0020	<0.0010	0.0011	0.0318	0.0012	0.0021	<0.0010	0.006	0.0051	0.0012	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	mg/L	<0.03	<0.0030	<0.0030	0.0066	0.0226	0.0098	<0.0030	<0.0030	0.0116	0.0068	<0.0030	<0.0030	<0.0030	0.0133	0.0071	0.0093	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium (Zr)	mg/L	<0.04	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.004	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Table B24 – 2009 SWEP results for End Grid core samples continued.

Parameter	Units	END-08-03A-0012 (341.50-341.76)	END-08-03A-002 (60.0-60.25)	END-08-03A-004 (104.50-104.72)	END-08-03A-006 (159.70-159.90)	END-08-03A-008 (220.88-221.10)	ENDG-09-01 (269.5-270)	ENDG-09-012 (361.6-361.2)	ENDG-09-013 (172.5-173)	ENDG-09-02 (238-238.4)	ENDG-09-02 (320.5-321)	ENDG-09-02 (442.1-442.6)	ENDG-09-03 (195-195.5)	ENDG-09-03 (372-372.5)	ENDG-09-03 (372-372.5) Duplicate	ENDG-09-04 (205.1-205.6)	ENDG-09-04 (368.4-369)	ENDG-09-05 (297-297.5)	ENDG-09-06 (233.45-234)	ENDG-09-07 (114.42-114.92)	ENDG-09-08A (261-261.5)
Waste Rock Type																					
Sample Mass	g	103.12	103.08	100.81	100.04	100.39	130.38	130.47	131.38	132.72	131.26	130.11	131.55	132.46	132.41	133.44	131.24	131.19	131.19	131.72	131.75
Water Added Mass	g	303.32	310.05	301.74	301.81	304.79	400.51	400.27	400.75	400.05	402.14	400.36	401.73	400.17	400.42	400.73	401.31	400.42	400.95	400.16	400.13
pH	--	6.63	4.66	5.91	3.35	6.11	6.5	6.73	5.89	6.09	6.55	7.01	6.08	7.33	6.55	2.63	6.68	7.94	5.85	6.21	3.36
Conductivity	mS/cm	0.08	0.09	0.11	0.17	0.08															
Acidity (as $CaCO_3$)	mg/L	6.4	11	6.5	5.9	5.7	2.6	3.0	2.8	16.4	9.8	<2.0	5.2	12.4	20.2	28.8	3.0	19.8	7.4	21.4	3.0
Sulphate (SO_4)	mg/L	<3	9.9	<3	<3	<3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Aluminum (Al)	mg/L	0.696	0.052	0.107	0.188	0.099	0.016	0.031	<0.010	0.054	0.047	0.221	0.213	0.078	0.102	0.018	0.102	0.132	0.068	0.024	0.042
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Arsenic (As)	mg/L	0.0038	0.0035	0.054	0.0177	0.002	0.0225	<0.0010	<0.0010	<0.0010	0.0015	<0.0010	<0.0010	<0.0010	0.0012	0.0017	<0.0010	0.0016	0.0062	<0.0010	0.0577
Barium (Ba)	mg/L	0.06	0.013	0.013	0.015	<0.010	0.057	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	mg/L	0.463	0.24	0.573	0.311	0.576	0.161	0.127	0.206	0.169	0.082	<0.050	<0.050	0.103	0.099	0.481	<0.050	0.106	0.438	0.165	0.326
Cadmium (Cd)	mg/L	0.00029	0.00012	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	<0.00010
Calcium (Ca)	mg/L	<0.5	3.5	4.23	4.97	0.92	2.46	<0.50	<0.50	<0.50	<0.50	3.57	1.42	<0.50	<0.50	1.20	<0.50	<0.50	1.71	<0.50	<0.50
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	mg/L	0.00153	0.00074	0.00076	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)	mg/L	0.031	0.0105	0.0036	0.0029	0.0018	0.0057	<0.0010	0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0028	<0.0010	<0.0010	<0.0010	<0.0010	0.0017
Iron (Fe)	mg/L	0.11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)	mg/L	0.003	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0074	<0.0010	<0.0010	<0.0010	<0.0010	0.0027
Magnesium (Mg)	mg/L	<0.5	1.46	1.58	1.88	<0.5	0.98	<0.50	<0.50	<0.50	<0.50	<0.50	0.65	<0.50	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50
Manganese (Mn)	mg/L	0.0019	0.0038	<0.001	0.0014	0.0022	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Molybdenum (Mo)	mg/L	0.0862	0.0267	0.0145	0.0064	0.0282	0.0152	0.0047	<0.0010	0.0043	0.0021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0022	0.0653	0.0020	<0.0010	0.0049
Nickel (Ni)	mg/L	0.005	0.0021	0.0035	0.0021	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)	mg/L	<0.050	<0.050	0.215	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)	mg/L	3.5	8.7	16.2	11.1	8.3	5.8	<1.0	2.1	1.3	1.4	<1.0	2.7	<1.0	<1.0	4.0	<1.0	1.6	5.0	2.8	2.0
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)	mg/L	4.33	2.53	4.66	3.06	3.46	1.63	0.24	0.49	0.33	0.29	0.34	0.61	0.32	0.43	1.34	0.20	0.27	1.42	0.61	0.60
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	mg/L	16.4	2.53	3.13	4.28	9.83	8.62	4.43	3.13	4.65	6.39	0.57	4.46	6.00	6.24	8.16	3.20	5.04	14.1	1.66	8.59
Strontium (Sr)	mg/L	0.0076	0.0765	0.114	0.135	0.0234	0.0722	<0.0010	0.0075	0.0013	<0.0010	0.0310	0.0373	<0.0010	<0.0010	0.0343	<0.0010	0.0061	0.0537	0.0140	0.0081
Sulfur (S)	mg/L	<1.0	3.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tungsten (W)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L	1.03	<0.005	<0.005	0.0364	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Vanadium (V)	mg/L	0.0205	<0.001	0.0062	0.0038	0.0049	0.0132	<0.0010	0.0017	<0.0010	0.0037	<0.0010	0.0024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0064	<0.0010	0.0242
Zinc (Zn)	mg/L	0.0105	0.0098	0.0143	0.0068	0.0155	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0077	<0.0030	<0.0030	<0.0030	<0.0030	0.0039
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Table B25 – 2009 SWEP results for Main Zone core samples.

Parameter	Units	MZ-07-01 (94-94.5)	MZ-07-03 (170-170.5)	MZ-07-04 (20-20.5)	MZ-07-05 (31-31.5)	MZ-07-01 (13-13.5)	MZ-07-01 (164-164.43)	MZ-07-01 (209-209.5)	MZ-07-01 (26-26.6)	MZ-07-01 (26.26.5) Duplicate	MZ-07-04 (7-7.5)	MZ-07-04 (93.72-94.2)	MZ-08-02 (29.5-30.0)	MZ-08-02 (85.0-85.5)	MZ-08-03 (10.48-11)	MZ-08-03 (24-24.25)	MZ-08-04 (251.05-251.55)	MZ-08-04 (151-151.5)	MZ-08-04 (166.5-167.2)	MZ-08-04 (211.5-211.84)	MZ-08-04 (110.0-110.5)	MZ-08-04 (189.06-189.32)	MZ-08-04-005 (136.26-136.50)	MZ-08-04-006 (166.23-166.50)
Waste Rock Type																								
Sample Mass	g	250.4	250.52	196.43	250.34	130.56	133.23	130.23	131.12	131.51	132.07	132.45	103.31	84.52	134.58	130.32	131.13	131.55	132.31	130.41	102.28	100.86	103.76	100.76
Water Added Mass	g	751.2	751.56	750.99	750.84	400.77	400.39	400.82	400.15	400.79	400.91	400.75	302.11	255.17	400.14	401.45	400.51	400.72	401.56	403.31	303.85	307.26	302.45	301.68
pH	--	6.57	6.75	6.69	7.78	5.70	6.68	6.04	5.92	4.99	3.56	5.74	7.08	6.40	5.62	5.85	4.93	5.31	5.86	7.72	6.35	5.65	6.12	6.14
Conductivity	mS/cm	0.94	0.03	0.04	0.07								0.13	0.15							0.20	0.11	0.20	0.07
Acidity (as $CaCO_3$)	mg/L	289	4	4	5	2.6	23.6	2.4	<2.0	11	43.0	2.6	-	5	12.6	13.2	33.8	2.4	2.2	16.4	5.2	5.5	8.7	5
Sulphate (SO_4)	mg/L	<30	<30	6	<3	<3.0	6.0	<3.0	<3.0	<3.0	40.8	<3.0	29.4	24.3	<3.0	<3.0	<3.0	<3.0	<3.0	3.9	31.5	4.5	<30	<3
Aluminum (Al)	mg/L	2.2	1.8	0.08	0.65	0.019	0.029	0.167	0.03	0.023	2.49	0.130	0.206	0.256	0.232	0.136	0.088	0.032	0.015	0.046	0.07	0.3	0.11	0.292
Antimony (Sb)	mg/L	<0.05	<0.05	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.050	<0.005
Arsenic (As)	mg/L	<0.01	<0.01	0.003	0.001	0.0084	<0.0010	0.0022	0.0017	0.0011	<0.0010	0.0083	0.0012	0.009	<0.0010	0.0013	0.0012	0.0109	0.0014	<0.0010	0.0049	0.0019	0.013	0.0026
Barium (Ba)	mg/L	<0.1	0.2	<0.01	0.03	<0.010	<0.010	<0.010	<0.010	<0.010	0.025	<0.010	0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.10	<0.010
Beryllium (Be)	mg/L	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.010	<0.001
Bismuth (Bi)	mg/L	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.010	<0.001
Boron (B)	mg/L	<0.5	<0.5	<0.05	0.09	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.076	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.097	0.059	<0.5	0.08
Cadmium (Cd)	mg/L	<0.001	<0.001	0.0005	0.0001	<0.00010	0.00014	<0.00010	<0.00010	<0.00010	0.00037	<0.00010	0.00071	0.00032	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0022	0.00029	0.0196	0.00015
Calcium (Ca)	mg/L	6	<5	1.4	7.7	<0.50	1.66	1.25	<0.50	<0.50	0.68	1.05	11.3	11.4	1.17	2.35	1.35	0.84	<0.50	0.97	11.3	5.26	19.5	4.18
Chromium (Cr)	mg/L	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.010	<0.001
Cobalt (Co)	mg/L	<0.005	<0.005	0.0015	0.0006	<0.00050	0.00142	<0.00050	<0.00050	<0.00050	0.195	<0.00050	<0.0005	<0.0005	<0.00050	<0.00050	0.00067	0.00058	<0.00050	<0.00050	<0.0005	<0.0005	<0.005	0.00087
Copper (Cu)	mg/L	0.02	0.03	0.004	0.015	<0.0010	<0.0010	<0.0010	0.0018	0.0033	0.663	<0.0010	0.0025	0.0068	<0.0010	<0.0010	<0.0010	0.0019	<0.0010	<0.0010	0.0051	0.0018	<0.010	0.0181
Iron (Fe)	mg/L	<0.5	0.5	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.232	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.5	<0.050
Lead (Pb)	mg/L	<0.01	0.01	<0.001	0.034	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	0.0012	<0.010	<0.001
Magnesium (Mg)	mg/L	<5	<5	0.6	3	<0.50	0.61	<0.50	<0.50	<0.50	4.34	<0.50	2.62	3.07	0.53	<0.50	<0.50	<0.50	<0.50	<0.50	4.22	1.52	5.6	1.26
Manganese (Mn)	mg/L	0.01	0.07	0.005	0.015	0.0011	0.0094	<0.0010	<0.0010	<0.0010	0.134	0.0112	0.0091	0.0048	0.0201	0.0041	0.0010	0.0062	0.0017	0.0033	0.0296	0.0085	<0.010	0.0042
Molybdenum (Mo)	mg/L	0.03	0.08	0.233	0.025	<0.0010	0.0624	0.0046	0.0401	0.0166	<0.0010	0.0045	0.271	0.121	0.0098	0.0056	0.0097	0.0023	0.0023	0.0272	0.865	0.0811	6.56	0.0164
Nickel (Ni)	mg/L	<0.02	<0.02	<0.002	0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0802	<0.0020	<0.002	0.0031	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.020	<0.002
Phosphorus (P)	mg/L	<0.5	0.6	0.12	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.067	0.051	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.5	<0.050
Potassium (K)	mg/L	<10	<10	4	5	<1.0	1.1	1.0	<1.0	<1.0	<1.0	<1.0	11	15.2	1.2	<1.0	1.2	<1.0	<1.0	<1.0	7.8	13.8	22	6.9
Selenium (Se)	mg/L	<0.05	<0.05	0.011	0.008	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0319	<0.005	<0.050	<0.005
Silicon (Si)	mg/L	5	5	1.7	4	0.21	0.34	0.57	0.24	0.26	0.14	0.54	3.92	4.3	0.55	0.16	0.27	0.28	0.2	0.17	3.46	4.76	3.6	3.37
Silver (Ag)	mg/L	<0.001	<0.001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.001	<0.0001
Sodium (Na)	mg/L	8	7	1.9	2.7	1.48	2.52	1.27	1.48	1.43	0.90	1.42	8.75	3.87	0.55	<0.50	2.06	1.03	1.24	1.81	3.97	5.66	<5.0	3.3
Strontium (Sr)	mg/L	0.12	0.07	0.027	0.032	0.0017	0.0444	0.0335	<0.0010	<0.0010	0.0066	0.0192	0.109	0.157	0.0060	0.0090	0.0401	0.0209	0.0148	0.0287	0.277	0.111	0.391	0.103
Sulfur (S)	mg/L	<10	<10	2	<1	<1.0	2.0	<1.0	<1.0	<1.0	13.6	<1.0	9.8	8.1	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	10.5	1.5	<10	<1.0
Thallium (Tl)	mg/L	<0.003	<0.003	<0.0003	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.0003	<0.0003	<0.003	<0.0003
Tin (Sn)	mg/L	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.010	<0.001
Titanium (Ti)	mg/L	<0.02	<0.02	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.020	<0.002
Tungsten (W)	mg/L	<0.1	<0.1	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.031	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	<0.10	<0.010
Uranium (U)	mg/L	0.42	0.08	0.03	0.903	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.492	0.0100	0.0277	0.614	<0.0050	<0.0050	<0.0050	<0.0050	0.0187	0.0106	0.0637	0.0508	1.03	0.0262
Vanadium (V)	mg/L	0.01	0.02	0.002	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0064	0.0403	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0025	0.0038	0.016	0.0032
Zinc (Zn)	mg/L	0.03	0.03	<0.003	0.027	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.113	<0.0030	<0.003	0.0032	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003	<0.003	<0.030	0.0053
Zirconium (Zr)	mg/L	<0.04	<0.04	<0.004	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.004	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.004	<0.004	<0.04	<0.004

Table B26 – 2009 SWEP results for Main Zone core samples continued.

Parameter	Units	MZ-08-04-008 (216.18-216.41)	MZ-08-05 (129-129.5)	MZ-08-05 (15-15.5)	MZ-08-05 (19.5-20.5)	MZ-08-05 (39.5-40.0)	MZ-08-05-004 (123.56-123.84)	MZ-08-06 (72-72.3)	MZ-08-06 (9-9.5)	MZ-08-06 (65.0-65.5)	MZ-08-06 (80.0-80.5)	MZ-08-07 (29.5-30.0)	MZ-08-07-001 (30.0-30.32)	MZ-08-16 (29.5-30.0)	MZ-09-01A (200-201)	MZ-09-01A (250.05-251.06)	MZ-09-01A (25-26)	MZ-09-01A (99.73-100.65)	MZ-09-02 (101-102)	MZ-09-02 (150-151)	MZ-09-02 (50.91-51.94)	MZ-09-03 (124.15-124.68)	MZ-09-03 (174.22-174.85)	MZ-09-03 (74.5-75)
Waste Rock Type																								
Sample Mass	g	102.27	130.65	133.65	102.11	101.34	101.63	132.47	133.66	100.55	105.15	100.39	101.82	104.68	131.34	129.96	131.52	130.25	131.19	132.24	131.14	131.75	133.65	133.19
Water Added Mass	g	300.45	400.10	400.11	303.44	302.62	305.44	400.65	400.56	300.78	303.09	300.66	303.47	307.39	400.42	401.05	400.77	400.27	400.16	400.95	402.28	401.12	400.12	401.23
pH	--	4.76	5.86	5.39	5.97	6.66	6.15	5.71	6.32	6.46	7.09	5.97	6.09	6.14	6.46	5.53	6.19	6.16	6.75	7.84	5.86	6.57	6.79	5.53
Conductivity	mS/cm	0.10			0.06	0.11	0.31			0.08	0.09	0.09	0.13	0.26										
Acidity (as $CaCO_3$)	mg/L	9.4	<2.0	25.2	4.2	5.4	5.5	17.8	12.4	4.6	-	5.2	5.7	6.4	13	<2.0	4	<2.0	2.6	<2.0	10.4	8.6	6.4	14.8
Sulphate (SO_4)	mg/L	5.7	5.7	<3.0	8.1	27.9	130.8	<3.0	<3.0	10.5	16.2	13.8	18.9	66	<3.0	<3.0	<3.0	<3.0	16.8	<3.0	<3.0	<3.0	<3.0	<3.0
Aluminum (Al)	mg/L	0.265	0.067	0.032	0.129	0.179	0.029	0.049	0.025	0.413	0.43	0.405	0.256	<0.10	0.281	0.113	0.405	0.117	0.161	0.371	0.242	0.306	0.368	0.330
Antimony (Sb)	mg/L	<0.005	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Arsenic (As)	mg/L	0.0019	<0.0010	<0.0010	0.0011	0.0087	0.0014	0.0014	0.0012	0.0028	<0.001	0.0027	0.0011	<0.010	0.001	0.001	0.0014	<0.0010	0.0180	0.0028	0.0010	<0.0010	0.0104	0.0013
Barium (Ba)	mg/L	<0.010	<0.010	<0.010	<0.010	0.013	0.041	<0.010	<0.010	0.011	0.01	<0.010	<0.010	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Beryllium (Be)	mg/L	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)	mg/L	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	mg/L	0.064	<0.050	<0.050	<0.050	0.092	0.061	<0.050	<0.050	<0.050	<0.050	0.078	<0.050	<0.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cadmium (Cd)	mg/L	0.00016	<0.00010	<0.00010	0.00017	0.00064	0.00267	<0.00010	<0.00010	0.00046	0.00017	0.00012	0.00039	0.0217	<0.00010	<0.00010	<0.00010	<0.00010	0.00420	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium (Ca)	mg/L	5.36	2.08	0.62	2.7	8.16	35	0.67	<0.50	6.5	10.8	6.66	7.47	27	4.2	2.64	4.13	1.73	5.49	4.53	4.27	4.3	4.96	5.74
Chromium (Cr)	mg/L	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0111	<0.001	<0.001	<0.001	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	mg/L	<0.0005	0.00536	<0.00050	<0.0005	0.0008	0.271	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	0.00059	0.0788	<0.00050	0.00068	<0.00050	<0.00050	0.00687	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)	mg/L	0.0018	0.0016	<0.0010	0.0029	0.0027	0.0072	<0.0010	0.0053	<0.001	<0.001	0.0063	0.0015	<0.010	0.001	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron (Fe)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)	mg/L	0.0023	0.0023	<0.0010	<0.001	<0.001	0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium (Mg)	mg/L	1.3	0.58	<0.50	0.99	2.95	8.65	<0.50	<0.50	2.21	2.33	2.03	2.34	7.6	<0.50	0.84	<0.50	<0.50	2.38	0.92	<0.50	<0.50	<0.50	<0.50
Manganese (Mn)	mg/L	0.0052	0.0158	0.0059	0.0022	0.0117	0.587	0.005	0.0032	0.0034	0.0021	0.014	0.02	0.128	<0.0010	0.0021	<0.0010	0.0018	0.0250	<0.0010	<0.0010	0.0011	0.0011	<0.0010
Molybdenum (Mo)	mg/L	0.0449	0.0069	0.0041	0.061	0.234	0.865	<0.0010	0.0034	0.183	0.0702	0.043	0.112	7.56	0.0028	0.0062	0.0086	<0.0010	1.56	0.0134	0.0064	<0.0010	<0.0010	0.0081
Nickel (Ni)	mg/L	<0.002	0.0022	<0.0020	<0.002	0.0023	0.231	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	0.068	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)	mg/L	7.9	1.1	1.1	7.7	11.6	20.2	<1.0	<1.0	6.4	5.3	9.3	14.1	29	<1.0	1.3	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	<1.0	<1.0
Selenium (Se)	mg/L	<0.005	<0.0050	<0.0050	<0.005	0.0261	0.0337	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)	mg/L	3.42	0.44	0.44	2.43	3.05	3.73	0.16	0.29	2.32	2.22	2.88	3.25	3.7	0.81	0.39	0.71	0.42	0.55	1.13	0.53	0.94	1.07	0.55
Silver (Ag)	mg/L	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	mg/L	4.46	0.92	1.07	1.71	2.67	3.08	<0.50	0.56	1.51	2.8	2.41	3.26	<5.0	<0.50	1.9	0.54	0.53	1.01	1.15	<0.50	0.54	0.59	<0.50
Strontium (Sr)	mg/L	0.139	0.0384	0.0090	0.0356	0.129	0.632	0.0108	0.0014	0.0998	0.105	0.0651	0.0566	0.279	0.0226	0.083	0.0327	0.016	0.104	0.0758	0.0251	0.0323	0.0476	0.0216
Sulfur (S)	mg/L	1.9	1.9	<1.0	2.7	9.3	43.6	<1.0	<1.0	3.5	5.4	4.6	6.3	22	<1.0	<1.0	<1.0	<1.0	5.6	<1.0	<1.0	<1.0	<1.0	<1.0
Thallium (Tl)	mg/L	<0.0003	<0.00030	<0.00030	<0.0003	<0.0003	0.0014	<0.00030	<0.00030	<0.0003	<0.0003	<0.0003	<0.0003	<0.003	<0.00030	<0.00030	<0.00030	<0.00030	0.00219	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tin (Sn)	mg/L	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	mg/L	<0.002	<0.0020	<0.0020	<0.002	<0.002	0.0022	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tungsten (W)	mg/L	<0.010	<0.010	<0.010	<0.010	0.037	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L	0.0079	0.0146	<0.0050	0.007	0.0906	0.121	<0.0050	0.0059	<0.005	<0.005	0.0108	0.0149	5.07	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Vanadium (V)	mg/L	0.0025	<0.0010	<0.0010	0.0015	0.009	<0.001	<0.0010	<0.0010	0.0023	0.0018	0.0021	0.0027	<0.010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	mg/L	0.0149	<0.0030	<0.0030	<0.003	0.0031	0.0657	<0.0030	<0.0030	<0.003	<0.003	<0.003	0.0046	<0.030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium (Zr)	mg/L	<0.004	<0.0040	<0.0040	<0.004	<0.004	<0.004	<0.0040	<0.0040	<0.004	<0.004	<0.004	<0.004	<0.04	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Table B27 – 2009 SWEP results for EZ core samples.

Parameter	Units	EZ-08-01 (39.15-39.21)	EZ-08-01 (42-42.5)	EZ-08-01 (42-42.5) Duplicate	EZ-08-01 (44.9-45)	EZ-08-01 (46.3-46.4)	EZ-08-01 (48-48.1)	EZ-08-01 (51-51.11)	EZ-08-01 (53-53.1)	EZ-08-01 (54.8-54.9)	EZ-08-01 (57-57.53)	EZ-08-01 (59-59.1)	EZ-08-01 (61.04-61.14)	EZ-08-01 (63-63.1)	EZ-08-01 (64.96-65.06)	EZ-08-01 (64.96-65.06) Duplicate	EZ-08-01 (66.95-67.1)	EZ-08-01 (68.5-69)	EZ-08-01 (71.5-71.6)
Waste Rock Type																			
Sample Mass	g	126.23	130.87	131.79	133.10	132.77	130.23	134.82	130.02	134.59	131.64	130.24	133.80	130.86	134.01	134.37	132.30	130.00	132.89
Water Added Mass	g	400.15	400.21	401.23	401.60	401.13	401.14	401.17	400.62	405.40	400.53	401.16	400.78	401.17	401.08	400.21	401.68	400.38	400.54
pH	--	6.10	5.63	5.68	5.14	5.84	6.90	7.56	5.79	5.17	5.29	6.63	6.10	6.11	5.82	5.93	5.72	6.11	5.58
Conductivity	mS/cm																		
Acidity (as $CaCO_3$)	mg/L	2.6	2.0	2.2	<2.0	2.6	2.4	2.4	2.6	<2.0	<2.0	<2.0	<2.0	2.0	<2.0	2.0	<2.0	<2.0	<2.0
Sulphate (SO_4)	mg/L	3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	5.4	<3.0	<3.0	<3.0	<3.0	<3.0
Aluminum (Al)	mg/L	0.097	0.033	0.069	0.029	0.035	0.038	0.035	0.033	0.035	0.182	0.136	0.015	0.229	0.158	0.120	0.254	0.213	0.034
Antimony (Sb)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Arsenic (As)	mg/L	0.0014	<0.0010	<0.0010	<0.0010	0.0123	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium (Ba)	mg/L	<0.010	<0.010	<0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.013	<0.010	<0.010	<0.010
Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cadmium (Cd)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium (Ca)	mg/L	<0.50	<0.50	<0.50	1.55	1.93	0.63	<0.50	<0.50	<0.50	1.78	3.37	0.75	3.75	1.97	2.30	2.84	4.39	0.62
Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	<0.0010	0.0011	<0.0010
Iron (Fe)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium (Mg)	mg/L	<0.50	<0.50	<0.50	0.77	0.95	<0.50	<0.50	<0.50	<0.50	0.51	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Manganese (Mn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	<0.0010	0.0022	<0.0010	0.0022	0.0025	0.0026	0.0011	0.0026
Molybdenum (Mo)	mg/L	<0.0010	<0.0010	<0.0010	0.0011	0.0020	0.0038	0.0016	0.0032	<0.0010	0.0017	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014
Nickel (Ni)	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)	mg/L	2.0	1.4	<1.0	2.2	2.4	1.5	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Selenium (Se)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)	mg/L	0.82	0.51	0.31	0.48	0.55	0.51	0.29	0.33	0.28	0.31	0.20	<0.1	0.47	0.33	0.23	0.33	0.36	0.20
Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	mg/L	1.85	1.28	1.11	2.41	3.02	2.73	1.43	1.88	1.16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium (Sr)	mg/L	<0.0010	0.0019	0.0013	0.0115	0.0144	0.0046	0.0018	0.0034	0.0024	0.0100	0.0107	0.0068	0.0174	0.0092	0.0099	0.0100	0.0114	0.0056
Sulfur (S)	mg/L	1.0	<1.0	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.8	<1.0	<1.00	<1.0	<1.0	<1.0
Thallium (Tl)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tungsten (W)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Vanadium (V)	mg/L	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	0.0019	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0034	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium (Zr)	mg/L	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040

Table B28 – Type I (<0.02) Andrew Lake core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.07	1.2	1.25	1.2	1.2	1.25	1.1	1.25	1.25	1.2	1.21	1.25	1.1	1.2	1.25	1.22	1.25	1.14
pH	---	4.31	3.04	3.01	6.06	3.15	6.1	6.17	3.95	4.1	4.95	3.77	4.7	6.23	5.76	5.74	5.81	5.87	5.57
Conductivity	mS/cm	0.04	0.17	0.15	0.08	0.06	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	4.8	26.6	29.6	2.7	15.8	2.4	2.4	4.0	3.8	2.8	4.6	3.2	<2	2.1	2.0	<2	<2	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	5.4	<15	3.9	<15	<2	<15	<2	<15	<2	<15	<2	<15	<2	<15	<2	<15	<2	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.020	0.020	0.032	0.016	0.037	0.024	0.022	0.019	0.019	0.025	0.021	0.027	0.013	0.019	0.026	0.030	0.023	0.013
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	0.044	0.021	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	0.140	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	2.65	3.54	1.61	13.2	0.56	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (Cu)	mg/L	<0.001	0.0018	0.0034	0.0010	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	1.02	1.57	0.75	2.83	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0020	0.0023	<0.001	0.0022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum (Mo)	mg/L	0.0016	0.0016	0.0015	0.0025	0.0020	0.0018	<0.001	0.0014	0.0011	0.0017	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel (Ni)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.050	0.065	<0.05	<0.05
Potassium (K)	mg/L	3.3	4.0	2.7	5.6	1.4	1.2	<1	1.1	1.1	1.0	<1	1.1	<1	<1	<1	<1	<1	<1
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	3.02	4.37	2.96	1.70	1.25	0.98	0.67	0.65	0.63	0.55	<0.5	<0.5	<0.5	0.56	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.0439	0.0504	0.0206	0.130	0.0064	0.0039	0.0034	0.0043	0.0032	0.0034	0.0033	0.0036	0.0028	0.0035	0.0028	0.0028	0.0031	0.0032
Sulphur (S)	mg/L	1.8	<5	1.3	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	<0.005	<0.005	<0.005	0.0727	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	0.0071	0.0069	0.0031	0.0057	<0.003	0.0031	<0.003	<0.003	0.0041	<0.003	0.0031	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**273.96 g**																		
Mass of Bottle + Wasterock	**1274.08 g**																		

Table B29 – Type I (<0.02) Andrew Lake core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.3	1.19	1.25	1.27	1.25	1.28	1.2	1.25	1.25	1.25	1.35	1.26	1.24	1.28	1.25	1.2	1.29	1.28	1.2
pH	---	6.31	5.19	5.44	5.01	5.37	4.54	5.26	4.77	5.79	5.88	4.5	5.58	5.44	6.54	6.13	5.78	5.57	5.67	5.39
Conductivity	mS/cm	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	<2	2.2	2.2	<2	<2	<2	11.8	<2	<2	2.4	2.6	2.8	2.2	2.8	4.0	2.6	2.2	2.8	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	2.61	<1.5	<1.5	<1.5	<1.5	<2	<2	<2	<2	<2	<2	<2	<2
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0046	0.0057	0.151	0.0046	0.0042	0.0052	<0.003	0.0115	0.0142	0.0129	0.0127	0.0091	0.0167	0.0159	0.0049	0.0063	0.0209	0.0575	0.0148
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00011	0.00010	<0.0001	0.00013	0.00015	0.00013	0.00031	<0.0001	0.00015	0.00023	0.00052	0.00042	0.00023	0.00013	0.00019	0.00019	<0.0001	<0.0001	0.00012
Barium (Ba)	mg/L	0.00132	0.00109	0.00147	0.00123	0.00129	0.00101	0.00164	0.00129	0.00131	0.00121	0.00130	0.00142	0.00108	0.00127	0.00142	0.00118	0.000890	0.000744	0.000730
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	0.365	0.352	0.457	0.296	0.310	0.294	0.499	0.290	0.310	0.316	0.320	0.416	0.308	0.373	0.460	0.360	0.283	0.422	0.234
Chromium (Cr)	mg/L	0.00011	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00014	0.00017	0.00016	0.00013	0.00017	0.00012	<0.0001	0.00016	0.00020	0.00016	0.00018	0.00013	0.00013
Cobalt (Co)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Cu)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00074	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00062	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	<0.00005	<0.00005	0.000083	<0.00005	<0.00005	<0.00005	0.000112	<0.00005	<0.00005	<0.00005	0.000051	0.000051	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium (Mg)	mg/L	0.174	0.127	0.145	0.138	0.130	0.135	0.157	0.146	0.135	0.146	0.144	0.169	0.125	0.144	0.174	0.151	0.140	0.128	0.129
Manganese (Mn)	mg/L	0.000081	<0.00005	0.000482	<0.00005	<0.00005	0.000058	0.000179	0.000083	0.000074	0.000144	0.000257	0.000112	0.000096	0.000502	0.000074	0.000074	0.000062	0.000201	0.000055
Molybdenum (Mo)	mg/L	0.000292	0.000220	0.000218	0.000201	0.000196	0.000244	0.000113	0.000120	0.000140	0.000243	0.000119	0.000147	0.000068	0.000157	0.000115	0.000089	0.000103	0.000100	0.000106
Nickel (Ni)	mg/L	<0.0005	<0.0005	0.00059	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.931	0.683	0.683	0.797	0.646	0.660	0.714	0.687	0.682	0.727	0.659	0.682	0.564	0.536	0.703	0.550	0.550	0.510	0.586
Selenium (Se)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon (Si)	mg/L	0.403	0.267	0.314	0.347	0.318	0.326	0.297	0.289	0.324	0.307	0.311	0.327	0.243	0.245	0.318	0.226	0.238	0.198	0.259
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.263	0.193	0.357	0.240	0.179	0.222	0.234	0.255	0.271	0.194	0.184	0.158	0.157	0.204	0.150	0.184	0.142	0.210	0.176
Strontium (Sr)	mg/L	0.00420	0.00285	0.00347	0.00310	0.00317	0.00314	0.00338	0.00327	0.00313	0.00315	0.00328	0.00390	0.00296	0.00333	0.00400	0.00315	0.00340	0.00312	0.00258
Sulphur (S)	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.87	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.000179	0.000115	0.000209	0.000176	0.000160	0.000180	0.000111	0.000144	0.000186	0.000111	0.000129	0.000112	0.000104	0.000120	0.000113	0.000109	0.000119	0.000119	0.000099
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	0.0057	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0040	<0.003	<0.003	0.0034	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Mass of Bottle	**273.96 g**
Mass of Bottle + Wasterock	**1274.08 g**

Table B30 – Type I (0.02-0.1) Andrew Lake core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.0	1.25	1.25	1.20	1.20	1.20	1.21	1.25	1.25	1.20	1.15	1.23	1.25	1.25	1.21	1.25	1.25	1.20
pH	---	2.92	3.17	2.99	5.67	3.73	3.62	5.93	5.58	5.01	4.01	3.46	4.87	6.17	6.06	5.82	5.72	5.72	6.11
Conductivity	mS/cm	0.30	0.23	0.19	0.00	0.01	0.07	0.00	0.00	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Acidity (as $CaCO_3$)	mg/L	34.4	20.0	28.0	2.2	4.6	5.8	3.5	2.2	<2	3.4	7.8	2.0	2.4	<2	3.0	<2	<2	2.6
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	10.8	18	10.2	<15	3.3	<15	2.7	<15	2.4	<15	1.8	<15	1.8	<15	1.8	<15	1.8	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.011	0.011	0.013	0.018	0.019	0.022	0.021	0.019	0.017	0.025	0.019	0.015	0.016	0.016	0.020	0.029	0.020	0.017
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	0.0014	0.0029	0.0014	0.0023	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	0.077	0.055	0.024	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	11.5	15.4	6.98	1.96	1.06	1.03	0.74	0.67	0.66	0.64	0.52	0.65	0.60	0.52	<0.5	0.56	0.64	0.58
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	0.00115	0.00064	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (Cu)	mg/L	0.0025	0.0033	0.0043	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	<0.001
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	3.31	5.52	2.79	0.76	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0051	0.0061	0.0019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum (Mo)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel (Ni)	mg/L	0.0035	0.0033	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	6.4	6.8	5.0	2.4	1.8	1.8	1.4	1.3	1.4	1.3	1.1	1.3	1.1	1.1	<1	1.0	1.2	<1
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	3.69	4.37	2.96	1.13	0.67	0.66	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.180	0.245	0.109	0.0294	0.0153	0.0149	0.0116	0.0105	0.0095	0.0094	0.0078	0.0088	0.0088	0.0086	0.0073	0.0091	0.0092	0.0087
Sulphur (S)	mg/L	3.6	6.0	3.4	<5	1.1	<5	0.9	<5	0.8	<5	0.6	<5	0.6	<5	0.6	<5	0.6	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	0.0312	0.0233	0.0136	0.0100	0.0077	0.0101	0.0069	0.0071	0.0053	0.0056	0.0051	0.0055	0.0057	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	0.0103	0.0168	0.0100	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0032	<0.003	0.0048	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**273.37 g**																		
Mass of Bottle + Wasterock	**1273.92 g**																		

Table B31 – Type I (0.02-0.1) Andrew Lake core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.30	1.20	1.24	1.24	1.25	1.23	1.20	1.21	1.20	1.19	1.25	1.30	1.20	1.22	1.33	1.18	1.30	1.23	1.24
pH	---	5.46	5.42	5.68	5.16	5.14	5.63	4.46	5.46	5.26	5.92	5.66	5.83	5.79	6.28	5.88	5.89	5.48	5.44	4.53
Conductivity	mS/cm	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
Acidity (as $CaCO_3$)	mg/L	<2	<2	2.0	2.0	<2	<2	4.2	2.0	<2	3.0	2.2	4.0	2.4	2.2	<2	2.0	2.0	2.4	5.5
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	1.74	<1.5	<1.5	2.16	1.77	1.62	2.25	1.53	1.62	<1.5	<1.5	<2	<2	<2	<2	<2	<2	<2	<2
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0046	0.0038	0.0044	0.291	0.0256	0.0065	0.0036	0.0116	0.0110	0.0078	0.0121	0.0097	0.0058	0.0402	0.0065	0.0058	0.0051	0.0413	0.0677
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00017	0.00013	0.00029	0.00012	0.00014	0.00012	0.00018	<0.0001	0.00012	0.00016	0.00027	0.00040	0.00014	0.00013	0.00012	0.00033	0.00011	<0.0001	0.00019
Barium (Ba)	mg/L	0.00176	0.00149	0.00148	0.00219	0.00185	0.00164	0.00210	0.00161	0.00177	0.00162	0.00153	0.00163	0.00125	0.00172	0.00174	0.00113	0.00122	0.000974	0.00111
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	0.010	<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
Cadmium (Cd)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	0.775	0.466	0.475	1.05	0.658	0.575	0.776	0.566	0.660	0.666	0.600	0.748	0.538	0.853	0.808	0.486	0.685	0.667	0.759
Chromium (Cr)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00010	0.00014	0.00013	0.00012	0.00015	0.00014	<0.0001	0.00011	0.00012	0.00018	0.00014	0.00014	<0.0001	0.00012
Cobalt (Co)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Cu)	mg/L	<0.0005	0.00059	<0.0005	0.00600	<0.0005	0.00072	0.00071	0.00061	0.00055	0.00051	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	<0.00005	<0.00005	<0.00005	0.000105	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000102	<0.00005	<0.00005	<0.00005	0.000068	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium (Mg)	mg/L	0.255	0.180	0.201	0.248	0.232	0.237	0.269	0.226	0.230	0.241	0.215	0.246	0.200	0.234	0.264	0.162	0.232	0.191	0.198
Manganese (Mn)	mg/L	0.000272	0.000190	0.000289	0.00180	0.000247	0.000257	0.000313	0.000237	0.000282	0.000218	0.000295	0.000250	0.000266	0.000756	0.000258	0.000230	0.000217	0.000299	0.000362
Molybdenum (Mo)	mg/L	0.000106	0.000097	0.000102	0.000088	0.000084	0.000115	0.000056	<0.00005	0.000110	0.000101	0.000075	0.000073	<0.00005	0.000113	0.000060	0.000174	0.000052	0.000084	0.000059
Nickel (Ni)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00056	<0.0005	<0.0005	<0.0005
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	1.04	0.711	0.722	0.943	0.803	0.827	0.843	0.714	0.812	0.840	0.673	0.716	0.543	0.605	0.730	0.544	0.607	0.512	0.627
Selenium (Se)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon (Si)	mg/L	0.347	0.219	0.244	0.307	0.282	0.287	0.267	0.233	0.286	0.267	0.258	0.285	0.188	0.208	0.273	0.161	0.211	0.164	0.218
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.203	0.125	0.153	0.348	0.141	0.209	0.246	0.210	0.215	0.186	0.151	0.151	1.56	0.228	0.140	0.115	0.126	0.170	0.242
Strontium (Sr)	mg/L	0.0101	0.00673	0.00791	0.00943	0.00909	0.00894	0.00956	0.00813	0.00893	0.00849	0.00835	0.00935	0.00685	0.00827	0.00974	0.00620	0.00890	0.00825	0.00639
Sulphur (S)	mg/L	0.58	<0.5	<0.5	0.72	0.59	0.54	0.75	0.51	0.54	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.00483	0.00342	0.00377	0.00416	0.00384	0.00429	0.00442	0.00389	0.00428	0.00409	0.00448	0.00495	0.00376	0.00482	0.00560	0.00406	0.00491	0.00472	0.00398
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	0.0061	<0.003	<0.003	<0.003	<0.003	<0.003	0.0049	<0.003	<0.003	<0.003	0.0033	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Mass of Bottle	**273.37 g**
Mass of Bottle + Wasterock	**1273.92 g**

Table B32 – Type I (<0.02) Main Zone core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.05	1.15	1.25	1.25	1.2	1.2	1.22	1.25	1.2	1.25	1.16	1.25	1.05	1.25	1.25	1.17	1.25	1.25
pH	---	3.23	3.26	2.94	5.33	3.44	5.94	4.3	6.42	3.89	3.15	3.33	5.14	5.72	6.41	6.31	6.22	6.05	5.69
Conductivity	mS/cm	0.12	0.12	0.15	0.00	0.04	0.04	0.00	0.01	0.00	0.12	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	32.2	20.0	36.6	2.4	10.0	2.2	3.2	2.6	3.6	24.9	6.4	<2	<2	2.2	2.2	<2	2.0	2.2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	1.8	<15	1.8	<15	<1.5	<15	<1.5	<15	<1.5	<15	<1.5	<15	<1.5	<15	<1.5	<15	<1.5	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.053	0.044	0.035	0.038	0.020	0.021	0.014	0.019	0.020	0.016	0.013	0.019	0.011	0.017	0.023	0.023	0.017	0.017
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	0.0015	0.0014	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	0.59	1.18	0.71	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (Cu)	mg/L	0.0028	0.0027	0.0041	<0.001	0.0013	<0.001	<0.001	<0.001	<0.001	0.0016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0028	0.0027	0.0021	0.0011	0.0013	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	0.0010	<0.001	0.0012	<0.001	<0.001	0.0011
Molybdenum (Mo)	mg/L	0.0135	0.0151	0.0141	0.0109	0.0041	0.0042	0.0044	0.0036	0.0045	0.0033	0.0020	0.0017	0.0015	0.0019	<0.001	<0.001	<0.001	<0.001
Nickel (Ni)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	1.3	1.4	1.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	3.63	4.09	3.20	1.80	1.15	1.01	0.88	0.86	0.85	1.10	0.62	0.61	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.0114	0.0186	0.0101	0.0051	0.0032	0.0022	0.0033	0.0031	0.0029	0.0042	0.0030	0.0035	0.0031	0.0045	0.0036	0.0034	0.0046	0.0040
Sulphur (S)	mg/L	0.6	<5	0.6	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	0.0219	0.0209	0.0163	0.0141	0.0084	0.0084	0.0093	0.0084	0.0104	0.0083	0.0068	0.0077	0.0061	0.0062	0.0060	0.0051	0.0062	0.0052
Vanadium (V)	mg/L	0.0036	0.0033	0.0031	0.0023	0.0024	0.0025	0.0019	0.0019	0.0017	0.0017	0.0015	0.0016	0.0012	0.0012	<0.001	0.0010	<0.001	<0.001
Zinc (Zn)	mg/L	0.0042	0.0083	0.0089	0.0047	0.0041	<0.003	<0.003	<0.003	<0.003	0.0110	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**274.56 g**																		
Mass of Bottle + Wasterock	**1274.96 g**																		

Table B33 – Type I (<0.02) Main Zone core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.25	1.21	1.25	1.17	1.3	1.23	1.3	1.25	1.25	1.19	1.25	1.29	1.22	1.23	1.27	1.2	1.3	1.31	1.25
pH	---	5.65	5.75	6.36	5.48	5.84	5	3.28	5.19	5.31	5.88	6.16	6.04	6.17	6.33	6.56	5.9	5.84	5.9	6.34
Conductivity	mS/cm	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	2.0	2.0	<2	<2	<2	2.2	7.0	2.0	2.0	5.0	2.4	2.4	<2	<2	<2	<2	2.6	2.0	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	3	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0052	0.0055	0.0076	0.0041	0.0057	0.0052	0.0042	0.0252	0.0053	0.0083	0.0168	0.0081	0.0038	0.0060	0.0053	0.0290	0.0061	0.0490	0.0050
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00018	0.00013	0.00026	0.00013	0.00028	0.00011	0.00038	<0.0001	0.00018	0.00017	0.00050	0.00055	<0.0001	0.00014	0.00010	0.00013	<0.0001	<0.0001	0.00014
Barium (Ba)	mg/L	0.000900	0.00111	0.00129	0.00103	0.00117	0.00103	0.00145	0.00111	0.00107	0.00099	0.00114	0.00116	0.000788	0.00104	0.00105	0.00103	0.000789	0.000679	0.000614
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	0.366	0.283	0.384	0.278	0.327	0.323	0.397	0.290	0.269	0.259	0.240	0.278	0.281	0.370	0.394	0.293	0.350	0.489	0.265
Chromium (Cr)	mg/L	0.00015	0.00011	<0.0001	<0.0001	<0.0001	<0.0001	0.00014	0.00012	0.00017	<0.0001	0.00015	0.00010	0.00020	<0.0001	0.00012	0.00011	0.00012	<0.0001	0.00011
Cobalt (Co)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Cu)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00051	0.00064	0.00055	0.00066	<0.0005	<0.0005	<0.0005	0.00173	<0.0005	<0.0005	0.00052	0.00060	<0.0005	<0.0005
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.035	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000168	<0.00005	0.000078	<0.00005	0.000088	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium (Mg)	mg/L	0.126	0.104	0.126	0.117	0.135	0.134	0.132	0.118	0.122	0.123	0.129	0.142	0.110	0.134	0.149	0.125	0.146	0.129	0.124
Manganese (Mn)	mg/L	0.00133	0.000905	0.00120	0.00101	0.00114	0.00121	0.00130	0.00113	0.00135	0.00099	0.00121	0.00133	0.00113	0.00107	0.00139	0.00121	0.00129	0.00127	0.00119
Molybdenum (Mo)	mg/L	0.00107	0.00105	0.00110	0.000836	0.000990	0.00109	0.00100	0.000424	0.000517	0.000562	0.000741	0.000666	0.000423	0.000587	0.000548	0.000412	0.000560	0.000632	0.000338
Nickel (Ni)	mg/L	0.00067	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00081	<0.0005	0.00086	0.00101	0.00080	<0.0005	<0.0005
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.460	0.391	0.437	0.482	0.414	0.426	0.417	0.351	0.393	0.415	0.351	0.384	0.308	0.329	0.383	0.328	0.343	0.323	0.319
Selenium (Se)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon (Si)	mg/L	0.223	0.191	0.205	0.221	0.230	0.215	0.199	0.193	0.186	0.166	0.202	0.198	0.121	0.158	0.184	0.114	0.174	0.145	0.137
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.270	0.170	0.213	0.221	0.160	0.206	0.216	0.164	0.213	0.144	0.151	0.162	0.124	0.127	0.134	0.187	0.126	0.168	0.106
Strontium (Sr)	mg/L	0.00400	0.00343	0.00411	0.00358	0.00418	0.00393	0.00393	0.00346	0.00373	0.00342	0.00374	0.00438	0.00324	0.00372	0.00428	0.00320	0.00450	0.00422	0.00331
Sulphur (S)	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.00603	0.00432	0.00675	0.00606	0.00612	0.00605	0.00567	0.00491	0.00480	0.00463	0.00561	0.00645	0.00491	0.00568	0.00706	0.00499	0.00699	0.00660	0.00570
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0032	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass of Bottle	**274.56 g**																			
Mass of Bottle + Wasterock	**1274.96 g**																			

Table B34 – Type I (0.02-0.05) Main Zone core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.1	1.2	1.2	1.25	1.2	1.25	1.22	1.25	1.2	1.17	1.25	1.25	1.25	1.25	1.22	1.24	1.24	1.21
pH	---	3.60	5.28	3.08	5.41	3.08	3.40	3.85	5.31	4.18	3.45	3.70	5.19	6.06	6.08	5.97	5.42	5.67	5.68
Conductivity	mS/cm	0.08	0.06	0.11	0.00	0.13	0.1	0.01	0.00	0.01	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	12.8	3.4	24.4	2.4	26.8	10.6	5.0	2.0	3.4	11.4	4.3	2.2	<2	<2	2.4	<2	2.4	2.0
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	12	<15	7.8	<15	2.7	<15	2.1	<15	2.1	<15	2.1	<15	1.8	<15	1.8	<15	1.8	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.025	0.029	0.058	0.048	0.021	0.026	0.023	0.022	0.035	0.025	0.032	0.020	0.014	0.012	0.023	0.019	0.018	0.020
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	<0.001	<0.001	0.0017	<0.001	0.0016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	0.00015	0.00018	0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	1.58	2.34	1.28	0.80	0.77	0.64	<0.5	<0.5	<0.5	0.61	0.61	0.55	<0.5	<0.5	<0.5	<0.5	<0.5	0.54
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	0.00123	0.00073	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (Cu)	mg/L	0.0026	0.0016	0.0046	0.0012	0.0039	0.0017	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	0.69	1.00	0.59	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0057	0.0063	0.0035	0.0026	0.0025	0.0018	0.0017	0.0015	0.0014	0.0020	0.0020	0.0019	0.0019	0.0018	0.0020	0.0020	0.0020	0.0022
Molybdenum (Mo)	mg/L	0.0353	0.0547	0.0501	0.0335	0.0206	0.0197	0.0140	0.0124	0.0091	0.0103	0.0097	0.0060	0.0054	0.0047	0.0032	0.0032	0.0026	0.0022
Nickel (Ni)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	2.7	2.7	2.0	1.4	1.1	1.2	<1	<1	<1	1.1	<1	1.0	<1	<1	<1	<1	<1	<1
Selenium (Se)	mg/L	<0.005	0.0070	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	3.90	4.31	3.45	1.99	1.35	1.20	0.74	0.64	0.64	0.63	0.54	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.0346	0.0428	0.0207	0.0131	0.0112	0.0088	0.0076	0.0075	0.0072	0.0094	0.0095	0.0089	0.0077	0.0078	0.0078	0.0084	0.0080	0.0084
Sulphur (S)	mg/L	4	<5	2.6	<5	0.9	<5	0.7	<5	0.7	<5	0.7	<5	0.6	<5	0.6	<5	0.6	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	0.0870	0.0623	0.0422	0.0506	0.0351	0.0323	0.0232	0.0235	0.0171	0.0220	0.0242	0.0199	0.0156	0.0131	0.0143	0.0142	0.0140	0.0150
Vanadium (V)	mg/L	0.0013	0.0017	0.0016	0.0012	0.0014	0.0015	0.0010	0.0011	0.0010	0.0011	<0.001	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	0.0116	0.0043	0.0170	0.0043	0.0036	<0.003	<0.003	<0.003	<0.003	0.0052	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**273.32 g**																		
Mass of Bottle + Wasterock	**1273.46 g**																		

Table B35 – Type I (0.02-0.05) Main Zone core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.21	1.29	1.16	1.25	1.24	1.22	1.25	1.25	1.25	1.2	1.25	1.25	1.19	1.26	1.25	1.23	1.24	1.27	1.26
pH	---	6.45	5.55	6.02	5.37	5.80	4.52	4.76	5.57	5.30	5.71	5.32	5.49	5.16	6.24	6.10	5.76	5.55	5.06	5.83
Conductivity	mS/cm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	<2	<2	2.0	<2	<2	<2	2.4	<2	<2	2.6	<2	3.2	2.0	3.5	<2	<2	2.0	2.4	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	1.77	1.86	1.5	1.83	1.65	1.68	2.19	1.5	1.8	1.5	1.74	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0052	0.0063	0.0050	0.0060	0.0363	0.0045	0.0034	0.0082	0.0115	0.0052	0.0123	0.0082	0.0048	0.0753	0.0213	0.0076	0.0096	0.0136	0.265
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00016	0.00012	0.00012	0.00013	0.00046	<0.0001	0.00015	<0.0001	0.00017	0.00011	0.00034	0.00049	<0.0001	0.00015	0.00010	0.00016	<0.0001	<0.0001	0.00013
Barium (Ba)	mg/L	0.000846	0.00118	0.000946	0.00101	0.00125	0.000997	0.00135	0.000891	0.00104	0.000892	0.000964	0.000817	0.000873	0.00131	0.000968	0.000845	0.000515	0.000443	0.000572
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	0.601	0.614	0.386	0.684	0.654	0.544	0.656	0.479	0.683	0.466	0.530	0.541	0.409	0.737	0.592	0.457	0.437	0.454	0.613
Chromium (Cr)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012	0.00013	<0.0001	0.00029	<0.0001	<0.0001	<0.0001	0.00012	0.00013	0.00012	0.00012	0.00014	0.00011	0.00019
Cobalt (Co)	mg/L	0.00026	0.00025	0.00025	0.00026	0.00027	0.00025	0.00032	0.00027	0.00028	0.00024	0.00025	0.00025	<0.0001	0.00025	0.00027	0.00022	0.00026	0.00024	0.00023
Copper (Cu)	mg/L	0.00074	0.00072	0.00059	0.00064	0.00060	0.00059	0.00089	0.00064	0.00061	<0.0005	0.00052	<0.0005	0.00182	0.00067	0.00051	0.00060	0.00069	0.00063	<0.0005
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000103	<0.00005	0.000057	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000065
Magnesium (Mg)	mg/L	0.256	0.246	0.202	0.256	0.246	0.233	0.242	0.215	0.236	0.204	0.207	0.205	0.102	0.213	0.226	0.172	0.182	0.178	0.198
Manganese (Mn)	mg/L	0.00254	0.00226	0.00203	0.00237	0.00246	0.00216	0.00249	0.00210	0.00240	0.00193	0.00219	0.00205	0.00153	0.00233	0.00238	0.00184	0.00193	0.00194	0.00212
Molybdenum (Mo)	mg/L	0.00300	0.00296	0.00201	0.00241	0.00209	0.00216	0.00187	0.00163	0.00193	0.00171	0.00150	0.00132	0.000577	0.00159	0.00137	0.000918	0.00116	0.00116	0.00100
Nickel (Ni)	mg/L	<0.0005	0.00056	<0.0005	<0.0005	0.00059	<0.0005	0.00053	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00070	0.00056	0.00084	0.00104	0.00072	<0.0005	0.00054
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.743	0.649	0.614	0.815	0.625	0.602	0.608	0.535	0.581	0.558	0.490	0.485	0.223	0.463	0.494	0.406	0.379	0.369	0.429
Selenium (Se)	mg/L	0.00034	0.00035	0.00027	0.00037	0.00029	0.00029	0.00026	0.00023	0.00026	0.00024	0.00027	0.00021	<0.0001	0.00020	0.00019	0.00013	0.00014	0.00015	0.00014
Silicon (Si)	mg/L	0.357	0.335	0.284	0.366	0.281	0.310	0.309	0.267	0.296	0.252	0.231	0.243	0.059	0.242	0.295	0.179	0.214	0.194	0.228
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.232	0.167	0.186	0.226	0.232	0.210	0.226	0.187	0.242	0.135	0.130	0.171	0.115	0.269	0.133	0.123	0.126	0.128	0.274
Strontium (Sr)	mg/L	0.00854	0.00854	0.00716	0.00899	0.00836	0.00765	0.00772	0.00683	0.00845	0.00642	0.00727	0.00697	0.00649	0.00674	0.00721	0.00520	0.00607	0.00598	0.00553
Sulphur (S)	mg/L	0.59	0.62	<0.5	0.61	0.55	0.56	0.73	0.50	0.60	<0.5	0.58	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.0156	0.0142	0.0143	0.0163	0.0159	0.0128	0.0149	0.0139	0.0154	0.0120	0.0133	0.0155	0.00207	0.0167	0.0186	0.0128	0.0147	0.0154	0.0135
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0043	<0.003	<0.003	<0.003	<0.003	0.0050
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass of Bottle	**273.32 g**																			
Mass of Bottle + Wasterock	**1273.46 g**																			

Table B36 – Type I (0.05-0.1) Main Zone core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.14	1.25	1.25	1.2	1.2	1.2	1.25	1.25	1.24	1.22	1.24	1.21	1.25	1.25	1.22	1.25	1.22	1.21
pH	---	5.24	3.53	3.17	4.92	3.34	6.04	4.16	6.05	4.05	6.04	4.28	5.73	5.74	6.2	5.73	6.39	5.77	5.83
Conductivity	mS/cm	0.00	0.07	0.10	0.00	0.04	0.03	0.00	0.00	0.03	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	3.8	10.4	15.2	2.4	10.6	2.8	3.2	2.0	4.2	<2	9.0	<2	<2	2.2	<2	<2	<2	2.2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<15	<1.5	<15	<1.5	<15	<1.5	<15	<1.5	<15	<1.5	<15	<2	<15	<2	<15	<2	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.064	0.033	0.042	0.032	0.022	0.033	0.015	0.023	0.021	0.029	0.018	0.024	0.017	0.021	0.021	0.028	0.029	0.015
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	0.65	1.33	0.85	0.87	0.85	0.84	0.64	0.63	0.77	0.66	0.67	0.64	0.70	0.59	0.62	0.66	0.71	0.61
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (Cu)	mg/L	<0.001	0.0035	0.0021	<0.001	0.0024	0.0011	0.0021	0.0012	<0.001	0.0011	0.0015	<0.001	0.0010	0.0011	<0.001	<0.001	0.0012	0.0024
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0026	0.0034	0.0021	0.0024	0.0023	0.0019	0.0016	0.0016	0.0019	0.0016	0.0017	0.0017	0.0021	0.0017	0.0018	0.0018	0.0022	0.0015
Molybdenum (Mo)	mg/L	0.0045	0.0106	0.0052	0.0059	0.0040	0.0036	0.0032	0.0023	0.0026	0.0021	0.0019	0.0015	0.0016	0.0015	0.0012	0.0012	0.0013	<0.001
Nickel (Ni)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	1.06	1.68	1.10	0.99	0.85	0.73	0.53	<0.5	0.52	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.0127	0.0266	0.0154	0.0142	0.0135	0.0142	0.0114	0.0096	0.0122	0.0113	0.0109	0.0112	0.0117	0.0106	0.0105	0.0116	0.0127	0.0100
Sulphur (S)	mg/L	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	<0.005	0.0079	<0.005	<0.005	<0.005	0.0055	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	0.0044	0.0058	<0.003	0.0067	<0.003	<0.003	0.0034	<0.003	<0.003	0.0030	0.0042	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**273.29 g**																		
Mass of Bottle + Wasterock	**1273.81 g**																		

Table B37 – Type I (0.05-0.1) Main Zone core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.25	1.21	1.24	1.23	1.27	1.24	1.15	1.23	1.25	1.25	1.25	1.26	1.21	1.25	1.26	1.23	1.22	1.29	1.26
pH	---	6.17	6.05	5.73	5.57	5.55	5.22	5.67	5.85	5.53	6.08	6.22	5.7	5.87	6.24	5.94	5.66	5.82	5.5	6.04
Conductivity	mS/cm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	<2	2.4	<2	<2	<2	<2	<2	<2	<2	4.0	2.0	2.0	2.0	3.0	<2	2.2	2.0	3.0	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0039	0.0055	0.0309	0.0078	0.0099	0.0093	0.0099	0.0147	0.0154	0.0118	0.0135	0.0101	0.0041	0.116	0.0132	0.0142	0.0076	0.0091	0.778
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012	<0.0001	<0.0001	<0.0001	0.00024	0.00046	<0.0001	<0.0001	<0.0001	0.00016	<0.0001	<0.0001	0.00013
Barium (Ba)	mg/L	0.000808	0.00103	0.00135	0.00112	0.00128	0.00116	0.00161	0.00121	0.00134	0.00122	0.00113	0.00113	0.000858	0.00182	0.00131	0.00132	0.000787	0.000736	0.00138
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	0.694	0.634	0.889	0.663	0.698	0.687	1.06	0.772	0.831	0.746	0.840	0.749	0.489	1.10	1.01	0.738	0.693	0.602	2.03
Chromium (Cr)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00011	0.00011	<0.0001	<0.0001	<0.0001	0.00012	0.00012	0.00140	0.00013	0.00012	<0.0001	0.00037
Cobalt (Co)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Cu)	mg/L	0.00086	0.00153	0.00140	0.00130	0.00123	0.00105	0.00107	0.00148	0.00102	0.00154	0.00117	0.00093	0.00184	0.00111	0.00085	0.00149	0.00149	0.00176	0.00148
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	0.028	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	<0.00005	<0.00005	0.000154	<0.00005	<0.00005	<0.00005	0.000073	<0.00005	0.000068	<0.00005	<0.00005	<0.00005	<0.00005	0.000051	<0.00005	<0.00005	<0.00005	<0.00005	0.000107
Magnesium (Mg)	mg/L	0.160	0.137	0.187	0.161	0.178	0.172	0.218	0.175	0.199	0.182	0.204	0.189	0.107	0.208	0.198	0.154	0.149	0.156	0.221
Manganese (Mn)	mg/L	0.00208	0.00139	0.00231	0.00175	0.00179	0.00188	0.00240	0.00197	0.00212	0.00163	0.00203	0.00217	0.00158	0.00272	0.00264	0.00211	0.00171	0.00171	0.00330
Molybdenum (Mo)	mg/L	0.000942	0.00112	0.00104	0.00102	0.000803	0.000898	0.000942	0.000799	0.000669	0.000888	0.000875	0.000794	0.000587	0.000929	0.000896	0.000556	0.000634	0.000571	0.000509
Nickel (Ni)	mg/L	<0.0005	<0.0005	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00144	<0.0005	0.00072	0.00066	0.00068	0.00079	0.00079	0.00104	0.00065	0.00075
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.322	0.240	0.350	0.389	0.303	0.309	0.352	0.301	0.328	0.306	0.299	0.285	0.222	0.318	0.296	0.277	0.232	0.198	0.553
Selenium (Se)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon (Si)	mg/L	0.085	0.077	0.106	0.101	0.092	0.087	0.110	0.087	0.104	0.083	0.093	0.089	<0.05	0.090	0.094	0.067	0.072	0.072	0.124
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.209	0.159	0.213	0.224	0.158	0.207	0.139	0.204	0.201	0.160	0.136	0.150	0.112	0.248	0.104	0.182	0.103	0.109	0.744
Strontium (Sr)	mg/L	0.0102	0.00877	0.0113	0.0102	0.0109	0.0105	0.0132	0.00991	0.0118	0.0105	0.0131	0.0118	0.00651	0.0118	0.0121	0.00775	0.00956	0.00952	0.00971
Sulphur (S)	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.00176	0.00233	0.00241	0.00209	0.00214	0.00202	0.00236	0.00240	0.00192	0.00207	0.00231	0.00281	0.00204	0.00644	0.00371	0.00230	0.00351	0.00247	0.00227
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0067	<0.003	<0.003	<0.003	<0.003	0.0061
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Mass of Bottle	**273.29 g**
Mass of Bottle + Wasterock	**1273.81 g**

Table B38 – Type III (>0.1) Andrew Lake core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.1	1.2	1.25	1.2	1.2	1.2	1.19	1.25	1.2	1.17	1.2	1.22	1.25	1.25	1.25	1.23	1.22	1.23
pH	---	3.06	2.94	2.97	5.13	3.45	4.02	5.15	4.31	4.49	4.29	3.55	4.39	5.57	5.27	4.99	4.59	4.76	4.76
Conductivity	mS/cm	0.10	0.21	0.17	0.00	0.02	0.03	0.00	0.03	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	27.8	36.6	26.8	2.4	8.2	3.8	2.4	12.0	2.6	2.6	5.6	2.1	<2	2.7	2.0	<2	<2	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	3	<15	6.6	<15	3.9	<15	4.5	<15	3	<15	2.7	<15	3	<15	3.3	<15	3.9	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.015	0.012	0.014	<0.01	0.013	<0.01	<0.01	0.011	<0.01	0.017	<0.01	<0.01	<0.01	0.011	0.013	<0.01	<0.01	<0.01
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	0.0015	0.0013	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	<0.01	0.028	0.013	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	<0.0001	0.00012	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	0.81	3.53	2.31	1.20	0.84	0.79	0.81	0.70	0.62	0.62	<0.5	0.62	0.54	0.58	0.54	0.62	0.64	0.81
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	<0.0005	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (Cu)	mg/L	<0.001	0.0030	0.0032	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	<0.5	1.45	1.02	0.56	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0016	0.0051	0.0031	0.0016	0.0015	0.0027	0.0014	0.0013	0.0011	0.0012	<0.001	0.0013	0.0013	0.0014	0.0013	0.0015	0.0034	0.0020
Molybdenum (Mo)	mg/L	0.0018	0.0028	0.0046	0.0029	0.0024	0.0020	0.0011	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel (Ni)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	1.6	2.5	2.1	1.4	1.2	1.1	1.1	<1	1.1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	1.27	2.01	1.61	0.92	0.64	0.62	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.0181	0.0596	0.0377	0.0192	0.0139	0.0124	0.0140	0.0114	0.0097	0.0096	0.0073	0.0102	0.0088	0.0103	0.0094	0.0113	0.0119	0.0134
Sulphur (S)	mg/L	1	<5	2.2	<5	1.3	<5	1.5	<5	1	<5	0.9	<5	1	<5	1.1	<5	1.3	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	0.0051	0.0098	0.0083	<0.003	<0.003	0.0269	<0.003	0.0036	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**274.00 g**																		
Mass of Bottle + Wasterock	**1274.56 g**																		

Table B39 – Type III (>0.1) Andrew Lake core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.25	1.21	1.24	1.26	1.2	1.27	1.15	1.25	1.3	1.21	1.3	1.25	1.22	1.24	1.27	1.19	1.29	1.25	1.24
pH	---	5.14	4.24	4.68	4.07	4.36	4.25	3.89	4.61	4.48	4.38	4.02	4.79	4.76	5.06	5.86	4.83	4.5	4.43	4.4
Conductivity	mS/cm	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	2.0	3.1	2.2	3.6	2.0	2.0	728	2.2	<2	2.8	4.2	3.4	2.7	3.0	2.7	2.2	2.8	2.6	2.2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	4.02	3.03	3.6	3.57	3.6	4.08	3.99	3.6	3.66	2.85	3.21	3.39	2.13	3.33	2.94	2.01	2.52	2.34	2.16
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.201	<0.003	0.242	<0.003	0.0034	0.385	0.0040	0.0040	0.0076	0.0039	0.0063	0.0055	0.0053	0.454	0.0069	0.0032	0.0046	0.0167	0.0430
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00012	<0.0001	0.00029	<0.0001	0.00067	0.00011	<0.0001	0.00013	0.00012	0.00030	0.00035	0.00040	0.00011	0.00010	0.00013	0.00026	0.00013	<0.0001	0.00011
Barium (Ba)	mg/L	0.00448	0.00321	0.00398	0.00346	0.00381	0.00448	0.00454	0.00376	0.00372	0.00317	0.00317	0.00346	0.00227	0.00378	0.00332	0.00192	0.00239	0.00171	0.00184
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	0.000020	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	1.15	0.615	0.969	0.764	0.826	0.771	0.999	0.846	0.641	0.693	0.590	0.755	0.457	1.34	0.807	0.443	0.645	0.610	0.514
Chromium (Cr)	mg/L	<0.0001	<0.0001	0.00066	<0.0001	<0.0001	0.00049	0.00011	0.00012	0.00012	<0.0001	<0.0001	<0.0001	0.00012	0.00016	0.00015	0.00014	0.00018	0.00014	0.00011
Cobalt (Co)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.00011	0.00014	0.00014	0.00012	0.00010	<0.0001	0.00012	0.00011	<0.0001	0.00010	0.00011	<0.0001	0.00011	<0.0001	<0.0001
Copper (Cu)	mg/L	0.00056	0.00078	0.00054	<0.0005	<0.0005	0.00055	0.00062	0.00059	0.00065	<0.0005	<0.0005	<0.0005	0.00052	0.00058	<0.0005	<0.0005	0.00061	0.00052	<0.0005
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000056	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium (Mg)	mg/L	0.331	0.260	0.327	0.300	0.315	0.457	0.329	0.303	0.281	0.254	0.261	0.280	0.189	0.275	0.258	0.166	0.230	0.178	0.187
Manganese (Mn)	mg/L	0.0113	0.00151	0.00184	0.00184	0.00191	0.00234	0.00234	0.00204	0.00212	0.00179	0.00187	0.00204	0.00146	0.00299	0.00199	0.00129	0.00183	0.00147	0.00156
Molybdenum (Mo)	mg/L	0.000082	0.000085	0.000064	0.000074	0.000071	0.000070	0.000054	<0.00005	0.000085	0.000076	0.000058	0.000050	<0.00005	0.000196	<0.00005	<0.00005	0.000077	<0.00005	<0.00005
Nickel (Ni)	mg/L	<0.0005	<0.0005	0.00068	<0.0005	<0.0005	0.00055	0.00061	<0.0005	0.00057	<0.0005	<0.0005	<0.0005	<0.0005	0.00060	0.00058	0.00064	0.00061	<0.0005	<0.0005
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.836	0.627	0.823	0.769	0.686	0.824	0.689	0.626	0.661	0.721	0.565	0.570	0.450	0.594	0.546	0.424	0.529	0.402	0.460
Selenium (Se)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon (Si)	mg/L	0.332	0.219	0.706	0.314	0.249	0.584	0.281	0.307	0.315	0.274	0.271	0.286	0.212	0.268	0.292	0.183	0.222	0.170	0.213
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.367	0.132	0.191	0.178	0.170	0.243	0.188	0.188	0.231	0.200	0.139	0.159	0.132	0.440	0.137	0.094	0.168	0.164	0.161
Strontium (Sr)	mg/L	0.0133	0.00949	0.0131	0.0115	0.0129	0.0139	0.0121	0.0112	0.0107	0.00891	0.0101	0.0110	0.00732	0.00958	0.00980	0.00643	0.00959	0.00692	0.00595
Sulphur (S)	mg/L	1.34	1.01	1.20	1.19	1.20	1.36	1.33	1.20	1.22	0.95	1.07	1.13	0.71	1.11	0.98	0.67	0.84	0.78	0.72
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.000491	0.000426	0.000487	0.000474	0.000426	0.000567	0.000206	0.000402	0.000436	0.000468	0.000462	0.000467	0.000359	0.000541	0.000471	0.000357	0.000370	0.000313	0.000326
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0169	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Mass of Bottle	**274.00 g**
Mass of Bottle + Wasterock	**1274.56 g**

Table B40 – Type III (>250) Andrew Lake core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	0.9	1.05	1.25	1.2	1.25	1.1	1.25	1.25	1.11	1.2	1.25	1.25	1.25	1.25	1.24	1.2	1.25	1.18
pH	---	3.28	3.23	2.99	6.01	3.84	5.62	6.18	3.51	4.24	3.63	3.77	5.58	6.46	6.59	6.18	5.88	6.27	6.04
Conductivity	mS/cm	1.12	1.01	0.45	0.00	0.03	0.04	0.00	0.03	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	21.2	20.0	27.6	2.2	5.6	3.4	<2	8.5	3.4	6.0	4.5	3.2	<2	<2	2.2	<2	2.0	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	1.8	<15	1.8	<15	<2	<15	<2	<15	<2	<15	<2	<15	<2	<15	<2	<15	<2	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.040	<0.01	<0.01	0.025	0.071	0.037	0.034	0.105	0.028	0.025	0.020	0.023	0.015	0.016	0.027	0.032	0.032	0.026
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	<0.001	0.0012	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	0.085	0.059	0.026	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	0.107	0.121	0.150	<0.05	0.133	0.104	0.082	0.089	0.054	0.056	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	159	123	52.7	0.53	5.10	1.82	1.34	1.37	1.02	0.94	0.93	0.81	0.75	0.65	0.71	0.59	0.66	0.69
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (Cu)	mg/L	0.0111	0.0019	0.0035	<0.001	0.0034	0.0011	<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	0.0016	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	0.0205	0.0013	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	19.2	22.8	11.1	<0.5	1.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0200	0.0200	0.0089	<0.001	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum (Mo)	mg/L	0.0030	0.0020	0.0023	0.0044	0.0057	0.0052	0.0027	0.0046	0.0033	0.0061	0.0036	0.0019	0.0022	0.0019	<0.001	0.0033	0.0035	0.0019
Nickel (Ni)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	22.0	16.2	11.5	1.5	3.8	2.4	1.7	1.9	1.8	1.5	1.4	1.4	1.3	1.2	1.0	1.1	1.1	1.0
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	1.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	8.58	7.72	4.53	1.47	1.05	0.59	0.70	0.54	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	1.30	1.29	0.550	0.0066	0.0529	0.0185	0.0149	0.0126	0.0100	0.0097	0.0084	0.0080	0.0076	0.0071	0.0061	0.0063	0.0070	0.0070
Sulphur (S)	mg/L	0.6	<5	0.6	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	0.0729	0.126	0.109	<0.005	0.0662	0.0647	0.0570	0.0567	0.0502	0.0495	0.0462	0.0426	0.0390	0.0299	0.0312	0.0292	0.0340	0.0314
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	0.0011	0.0012	0.0011	0.0011	0.0011	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	0.0525	0.0169	0.0182	<0.003	0.0081	<0.003	<0.003	0.0066	<0.003	<0.003	0.0046	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**273.95 g**																		
Mass of Bottle + Wasterock	**1274.08 g**																		

Table B41 – Type III (>250) Andrew Lake core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.35	1.15	1.27	1.18	1.35	1.25	1.2	1.25	1.25	1.25	1.27	1.27	1.15	1.3	1.28	1.22	1.14	1.38	1.25
pH	---	6.1	5.6	5.69	5.88	6.07	5.93	3.89	5.71	6.05	6.54	6.23	6.26	5.84	6.82	6.35	6.08	5.73	5.89	6.42
Conductivity	mS/cm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	<2	2.4	2.0	<2	<2	<2	<2	2.4	<2	2.2	3.0	2.1	2.4	2.6	3.6	2.0	3.2	3.2	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	1.74	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0053	0.0104	0.315	0.0070	0.0150	0.0343	0.0038	0.0334	0.0285	0.0205	0.0160	0.0072	0.0104	0.0609	0.0348	0.0101	0.0078	0.0433	0.0140
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00016	<0.0001	0.00019	0.00011	0.00011	<0.0001	0.00027	<0.0001	0.00013	0.00018	0.00048	0.00025	<0.0001	0.00058	0.00010	0.00013	<0.0001	<0.0001	0.00015
Barium (Ba)	mg/L	0.000428	0.000490	0.00107	0.000538	0.000585	0.000857	0.000595	0.000560	0.000573	0.000552	0.000529	0.000545	0.000623	0.000987	0.000865	0.000420	0.000230	0.000265	0.000217
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	0.024	0.014	0.018	0.017	0.016	0.017	0.015	0.013	0.017	0.016	0.014	0.013	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01
Cadmium (Cd)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	0.792	0.553	1.13	0.615	0.692	0.614	0.804	0.661	0.525	0.462	0.521	0.590	0.500	0.722	0.947	0.368	0.519	0.610	0.441
Chromium (Cr)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.00011	0.00014	0.00013	0.00013	0.00014	0.00015	0.00012	<0.0001	<0.0001	0.00015	0.00017	0.00011	0.00016	0.00012	0.00031
Cobalt (Co)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Cu)	mg/L	0.00054	0.00055	<0.0005	0.00055	<0.0005	<0.0005	<0.0005	0.00057	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00060	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	0.000099	0.000052	0.000158	0.000075	0.000096	0.000201	0.000144	0.000091	0.000197	0.000131	0.000068	0.000062	<0.00005	0.000101	0.000075	<0.00005	<0.00005	<0.00005	0.000057
Magnesium (Mg)	mg/L	0.195	0.124	0.161	0.136	0.145	0.149	0.156	0.150	0.143	0.143	0.126	0.156	0.120	0.142	0.175	0.108	0.119	0.118	0.113
Manganese (Mn)	mg/L	0.000568	0.000221	0.00118	0.000275	0.000309	0.000313	0.000419	0.000309	0.000356	0.000307	0.000323	0.000329	0.000389	0.000621	0.000635	0.000316	0.000299	0.000375	0.000273
Molybdenum (Mo)	mg/L	0.000826	0.000253	0.000706	0.000514	0.000575	0.000678	0.000318	0.000227	0.000258	0.000699	0.000220	0.000303	0.000122	0.000924	0.000160	0.000202	0.000219	0.000219	0.000274
Nickel (Ni)	mg/L	<0.0005	<0.0005	0.00053	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	1.14	0.773	0.932	0.977	0.838	0.843	0.885	0.802	0.859	0.850	0.743	0.809	0.619	0.646	0.847	0.579	0.600	0.567	0.597
Selenium (Se)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon (Si)	mg/L	0.601	0.390	0.487	0.496	0.485	0.531	0.465	0.435	0.510	0.476	0.454	0.458	0.339	0.358	0.481	0.292	0.295	0.314	0.315
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.267	0.141	0.499	0.200	0.162	0.203	0.222	0.223	0.214	0.200	0.122	0.120	0.141	0.221	0.212	0.136	0.145	0.130	0.251
Strontium (Sr)	mg/L	0.00809	0.00505	0.00677	0.00558	0.00619	0.00600	0.00607	0.00576	0.00579	0.00546	0.00542	0.00655	0.00521	0.00552	0.00673	0.00424	0.00490	0.00493	0.00424
Sulphur (S)	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.58	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.0367	0.0249	0.0301	0.0306	0.0308	0.0327	0.0336	0.0312	0.0306	0.0292	0.0300	0.0355	0.0293	0.0320	0.0391	0.0277	0.0293	0.0286	0.0266
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	0.0108	<0.003	0.0038	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0040	0.0042	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass of Bottle	**273.95 g**																			
Mass of Bottle + Wasterock	**1274.08 g**																			

Table B42 – Type III (0.1-0.3) Main Zone core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.1	1.2	1.25	1.2	1.2	1.2	1.21	1.3	1.23	1.19	1.3	1.23	1.25	1.2	1.24	1.2	1.25	1.23
pH	---	3.47	6.11	3.01	6.08	3.36	5.08	6.52	6.51	5.55	6.01	5.33	3.38	6.11	6.39	6.54	6.6	6.51	6.55
Conductivity	mS/cm	0.06	0.07	0.12	0.00	0.03	0.03	0.00	0.00	0.03	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	15.2	2.8	23.0	2.7	9.4	2.6	2.4	<2	2.0	<2	3.0	12.0	<2	2.1	2.0	<2	<2	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	5.7	<15	6.9	<15	2.4	<15	1.8	<15	<2	<15	<2	<15	<2	<15	<2	<15	<2	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.083	0.050	0.045	0.040	0.014	0.042	0.024	0.030	0.031	0.033	0.032	0.037	0.023	0.026	0.036	0.032	0.024	0.020
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	2.25	3.59	2.42	1.64	1.54	1.32	1.20	1.57	1.24	1.34	1.51	1.32	1.28	1.15	1.13	1.07	1.25	1.17
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	0.00275	0.00728	0.00343	0.00147	0.00204	0.00112	0.00181	0.00134	0.00107	0.00113	0.00104	0.00090	0.00083	0.00097	0.00068	0.00070	0.00083	0.00098
Copper (Cu)	mg/L	0.0020	0.0017	0.0021	<0.001	0.0017	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	0.69	1.33	0.91	0.59	0.50	<0.5	<0.5	0.51	<0.5	<0.5	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0058	0.0129	0.0060	0.0031	0.0035	0.0025	0.0027	0.0027	0.0022	0.0024	0.0026	0.0023	0.0026	0.0023	0.0021	0.0020	0.0021	0.0024
Molybdenum (Mo)	mg/L	0.0157	0.0249	0.0153	0.0082	0.0074	0.0064	0.0060	0.0062	0.0040	0.0040	0.0048	0.0027	0.0031	0.0027	0.0021	0.0019	0.0020	0.0016
Nickel (Ni)	mg/L	0.0030	0.0040	0.0021	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	1.9	1.9	1.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	1.70	2.04	1.35	0.73	0.58	0.53	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.0285	0.0528	0.0334	0.0212	0.0198	0.0168	0.0169	0.0209	0.0152	0.0173	0.0190	0.0161	0.0163	0.0155	0.0139	0.0137	0.0160	0.0136
Sulphur (S)	mg/L	1.9	<5	2.3	<5	0.8	<5	0.6	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5	<0.5	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	0.0251	0.0995	0.0741	0.0566	0.0595	0.0405	0.0497	0.0567	0.0301	0.0439	0.0534	0.0381	0.0357	0.0300	0.0320	0.0261	0.0394	0.0347
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	0.0073	<0.003	0.0066	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0067	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**273.92 g**																		
Mass of Bottle + Wasterock	**1274.37 g**																		

Table B43 – Type III (0.1-0.3) Main Zone core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.26	1.25	1.25	1.25	1.35	1.25	1.2	1.22	1.3	1.21	1.27	1.25	1.21	1.25	1.25	1.26	1.25	1.24	1.2
pH	---	6.52	6.06	6.13	6.3	5.84	5.48	3.49	5.63	5.99	6.19	5.53	5.89	6.33	6.58	5.9	6.38	6.18	5.94	6.24
Conductivity	mS/cm	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	<2	2.2	<2	<2	<2	<2	8.1	<2	2.2	3.1	2.2	<2	2.6	2.0	<2	2.0	2.0	2.0	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	2.31	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0113	0.0099	0.0073	0.112	0.0192	0.0125	0.0079	0.0155	0.233	0.0154	0.0226	0.0162	0.0075	0.0210	0.0177	0.0172	0.0163	0.0126	0.0228
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00012	<0.0001	0.00014	<0.0001	<0.0001	<0.0001	0.00024	<0.0001	0.00011	0.00013	0.00059	0.00045	<0.0001	<0.0001	<0.0001	0.00014	<0.0001	<0.0001	<0.0001
Barium (Ba)	mg/L	0.00100	0.000942	0.00101	0.00130	0.000952	0.000901	0.000968	0.000943	0.00176	0.00107	0.00107	0.000985	0.000921	0.00116	0.00113	0.00110	0.000641	0.000502	0.000562
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000011	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	1.62	1.28	1.34	1.55	1.21	1.09	1.36	1.40	5.36	1.11	1.41	1.22	0.923	1.47	1.49	1.22	1.25	1.04	1.13
Chromium (Cr)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.00011	0.00014	0.00014	0.00014	0.00018	0.00016	0.00012	<0.0001	0.00011	0.00013	0.00012	0.00015	0.00016	0.00012	0.00012
Cobalt (Co)	mg/L	0.00109	0.00086	0.00092	0.00083	0.00092	0.00084	0.00090	0.00093	0.00093	0.00086	0.00088	0.00103	0.00080	0.00090	0.00095	0.00088	0.00092	0.00093	0.00093
Copper (Cu)	mg/L	<0.0005	0.00072	<0.0005	0.00055	<0.0005	0.00060	0.00058	0.00060	0.00094	<0.0005	<0.0005	<0.0005	0.00058	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	<0.00005	<0.00005	<0.00005	0.000053	<0.00005	<0.00005	0.000120	<0.00005	0.000349	<0.00005	0.000090	0.000051	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Magnesium (Mg)	mg/L	0.478	0.373	0.345	0.368	0.342	0.330	0.310	0.337	0.453	0.352	0.371	0.366	0.241	0.331	0.357	0.335	0.320	0.251	0.290
Manganese (Mn)	mg/L	0.00327	0.00232	0.00250	0.00285	0.00251	0.00232	0.00245	0.00255	0.00369	0.00265	0.00283	0.00295	0.00233	0.00277	0.00309	0.00295	0.00279	0.00253	0.00270
Molybdenum (Mo)	mg/L	0.00233	0.00197	0.00185	0.00218	0.00173	0.00180	0.00181	0.00156	0.00307	0.00155	0.00178	0.00144	0.00102	0.00143	0.00143	0.00106	0.00119	0.00112	0.00103
Nickel (Ni)	mg/L	0.00081	0.00086	0.00071	0.00076	0.00069	0.00073	0.00072	0.00070	0.00114	0.00070	0.00069	0.00071	0.00075	0.00071	0.00108	0.00151	0.00072	0.00064	0.00070
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.481	0.357	0.337	0.437	0.342	0.343	0.318	0.309	0.445	0.361	0.327	0.330	0.257	0.268	0.315	0.301	0.270	0.222	0.273
Selenium (Se)	mg/L	0.00013	0.00013	0.00012	0.00012	0.00010	<0.0001	0.00011	<0.0001	0.00010	<0.0001	0.00012	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon (Si)	mg/L	0.222	0.162	0.160	0.198	0.170	0.171	0.143	0.145	0.218	0.157	0.165	0.163	0.108	0.137	0.162	0.108	0.128	0.094	0.109
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.236	0.145	0.143	0.226	0.148	0.211	0.190	0.196	1.10	0.209	0.129	0.170	0.133	0.173	0.126	0.213	0.123	0.125	0.156
Strontium (Sr)	mg/L	0.0190	0.0149	0.0139	0.0149	0.0141	0.0126	0.0117	0.0126	0.0194	0.0128	0.0155	0.0150	0.00990	0.0131	0.0142	0.0118	0.0129	0.0101	0.00975
Sulphur (S)	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.77	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00017
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.0358	0.0387	0.0353	0.0398	0.0337	0.0287	0.0292	0.0353	0.0343	0.0283	0.0376	0.0277	0.0252	0.0365	0.0304	0.0294	0.0363	0.0305	0.0277
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	0.0036	<0.003	<0.003	<0.003	<0.003	0.0077	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass of Bottle	**273.92 g**																			
Mass of Bottle + Wasterock	**1274.37 g**																			

Table B44 – Type III (0.3-0.5) Main Zone core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.12	1.15	1.25	1.2	1.2	1.25	1.25	1.21	1.24	1.25	1.23	1.25	1.15	1.25	1.25	1.25	1.25	1.23
pH	---	3.24	3.22	3.02	2.07	3.52	6.19	5.44	6.21	6.27	5.89	4.4	3.29	6.38	6.63	6.54	6.43	6.31	6.15
Conductivity	mS/cm	0.14	0.14	0.16	0.11	0.03	0.03	0.00	0.00	0.01	0.00	0.03	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	27.6	16.8	21.6	815	5.4	2.7	2.6	2.4	<2	<2	8.2	13.0	<2	<2	2.0	<2	<2	2.2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	12.3	19.5	10.2	<15	3.3	<15	3	<15	3	<15	2.4	<15	2.1	<15	1.8	<15	1.8	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.048	0.026	0.029	0.030	0.022	0.033	0.015	0.053	0.029	0.035	0.023	0.041	0.034	0.029	0.036	0.039	0.033	0.015
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	0.0015	0.0014	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	<0.0001	0.00016	0.00015	<0.0001	<0.0001	<0.0001	0.00017	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	4.54	6.88	4.28	2.51	2.46	2.45	2.12	1.76	2.02	2.12	1.92	1.96	1.79	1.66	1.58	1.79	1.84	1.46
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	0.0122	0.0123	0.00529	0.00203	0.00200	0.00156	0.00163	0.00107	0.00102	0.00107	0.00094	0.00085	0.00071	0.00088	0.00071	0.00078	0.00083	0.00083
Copper (Cu)	mg/L	0.0021	0.0034	0.0038	<0.001	0.0020	0.0013	0.0016	<0.001	<0.001	0.0010	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0015
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	0.83	1.63	1.16	0.63	0.53	0.55	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0216	0.0370	0.0222	0.0113	0.0114	0.0104	0.0099	0.0075	0.0078	0.0088	0.0079	0.0081	0.0076	0.0076	0.0067	0.0077	0.0081	0.0066
Molybdenum (Mo)	mg/L	0.0198	0.0516	0.0443	0.0250	0.0226	0.0304	0.0466	0.0158	0.0101	0.0177	0.0137	0.0225	0.0085	0.0076	0.0097	0.0061	0.0062	0.0051
Nickel (Ni)	mg/L	0.0099	0.0104	0.0044	0.0024	0.0021	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	1.2	1.3	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	1.14	1.56	1.12	0.64	0.55	0.57	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.0770	0.151	0.0889	0.0494	0.0452	0.0465	0.0437	0.0307	0.0341	0.0350	0.0313	0.0331	0.0299	0.0299	0.0245	0.0294	0.0294	0.0226
Sulphur (S)	mg/L	4.1	6.5	3.4	<5	1.1	<5	1	<5	1	<5	0.8	<5	0.7	<5	0.6	<5	0.6	<5
Thallium (Tl)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	0.0393	0.0708	0.0556	0.0406	0.0327	0.0295	0.0273	0.0147	0.0115	0.0139	0.0139	0.0135	0.0120	0.0088	0.0090	0.0106	0.0110	0.0093
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	0.0030	0.0064	0.0089	<0.003	0.0071	<0.003	0.0038	<0.003	<0.003	0.0036	0.0056	0.0047	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**274.66 g**																		
Mass of Bottle + Wasterock	**1274.75 g**																		

Table B45 – Type III (0.3-0.5) Main Zone core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.25	1.29	1.21	1.23	1.25	1.26	1.25	1.21	1.25	1.23	1.25	1.26	1.21	1.27	1.27	1.21	1.25	1.25	1.23
pH	---	6.36	6	6.12	5.82	6.04	5.74	6.12	5.93	6.07	6.24	6.06	6.14	6.08	6.64	6.19	6.27	6.27	6.12	6.13
Conductivity	mS/cm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	<2	2.6	<2	<2	<2	<2	<2	2.0	2.4	2.0	2.4	2.4	2.2	2.8	<2	<2	3.0	2.6	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<1.5	<1.5	<1.5	1.92	<1.5	1.89	1.53	1.59	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	1.59
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0121	0.0139	0.0105	0.0220	0.0222	0.0179	0.0295	0.0117	0.0213	0.0175	0.0237	0.0196	0.0122	0.0145	0.0168	0.0177	0.0171	0.0683	0.0293
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.00016	<0.0001	0.00011	<0.0001	<0.0001	<0.0001	0.00016	0.00031	<0.0001	<0.0001	<0.0001	0.00015	<0.0001	<0.0001	0.00017
Barium (Ba)	mg/L	0.00135	0.00134	0.00120	0.00145	0.00156	0.00155	0.00240	0.00128	0.00145	0.00148	0.00122	0.00138	0.000974	0.00122	0.00132	0.00101	0.000903	0.000846	0.000883
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	0.000031	<0.00001	<0.00001	<0.00001	0.000011	<0.00001	<0.00003	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000012	<0.00001
Calcium (Ca)	mg/L	1.79	1.54	1.56	1.69	1.76	1.60	3.77	1.39	1.58	1.45	1.67	1.91	1.12	1.92	1.77	1.44	1.69	1.52	1.57
Chromium (Cr)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.00016	0.00012	0.00016	<0.0001	<0.0001	0.00011	0.00010	0.00011	<0.0001	<0.0001	0.00013	0.00012	0.00010	<0.0001	0.00011
Cobalt (Co)	mg/L	0.00096	0.00076	0.00075	0.00065	0.00082	0.00077	0.00035	0.00069	0.00067	0.00066	0.00056	0.00071	0.00052	0.00060	0.00063	0.00050	0.00055	0.00052	0.00056
Copper (Cu)	mg/L	0.00079	0.00139	0.00086	0.00120	0.00205	0.00089	0.00108	0.00123	0.00085	0.00097	0.00121	0.00061	0.00115	0.00076	0.00077	0.00087	0.00106	0.00151	0.00094
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	0.000080	<0.00005	0.000067	0.000066	0.000074	0.000060	0.000076	<0.00005	0.000092	0.000063	0.000099	0.000088	<0.00005	<0.00005	0.000096	<0.00005	0.000065	0.000176	0.000061
Magnesium (Mg)	mg/L	0.358	0.299	0.275	0.317	0.342	0.376	0.330	0.293	0.353	0.357	0.328	0.369	0.217	0.316	0.327	0.252	0.285	0.257	0.286
Manganese (Mn)	mg/L	0.00802	0.00628	0.00647	0.00691	0.00716	0.00804	0.00376	0.00680	0.00777	0.00771	0.00675	0.00775	0.00548	0.00714	0.00741	0.00579	0.00666	0.00654	0.00680
Molybdenum (Mo)	mg/L	0.00988	0.00589	0.0115	0.00803	0.0131	0.00615	0.129	0.00460	0.0101	0.00866	0.0130	0.00867	0.00361	0.00444	0.00631	0.00356	0.00676	0.00927	0.00367
Nickel (Ni)	mg/L	0.00086	0.00081	0.00083	0.00094	0.00354	0.00085	<0.0005	0.00073	0.00071	0.00077	0.00067	0.00101	0.00082	0.00079	0.00124	0.00081	0.00081	0.00103	0.00085
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.293	0.225	0.221	0.281	0.261	0.277	0.249	0.201	0.259	0.255	0.212	0.246	0.167	0.196	0.212	0.183	0.190	0.215	0.202
Selenium (Se)	mg/L	0.00028	0.00025	0.00028	0.00026	0.00031	0.00025	<0.0001	0.00023	0.00027	0.00023	0.00026	0.00026	0.00018	0.00017	0.00019	0.00017	0.00019	0.00012	0.00016
Silicon (Si)	mg/L	0.127	0.103	0.092	0.115	0.103	0.122	0.120	0.089	0.116	0.104	0.110	0.107	0.070	0.092	0.098	0.075	0.087	0.079	0.082
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.148	0.096	0.111	0.139	0.238	0.155	0.185	0.126	0.155	0.123	0.101	0.119	0.077	0.103	0.114	0.108	0.086	0.193	0.114
Strontium (Sr)	mg/L	0.0265	0.0220	0.0200	0.0226	0.0251	0.0272	0.0253	0.0205	0.0249	0.0233	0.0235	0.0261	0.0163	0.0217	0.0228	0.0153	0.0206	0.0182	0.0168
Sulphur (S)	mg/L	<0.5	<0.5	<0.5	<0.5	0.64	<0.5	0.63	0.51	0.53	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.53
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00014	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.00965	0.00966	0.00793	0.00957	0.00790	0.00785	0.00176	0.00824	0.00805	0.00771	0.00988	0.00883	0.00665	0.00740	0.00750	0.00585	0.00858	0.00582	0.00568
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0053	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass of Bottle	**274.66 g**																			
Mass of Bottle + Wasterock	**1274.75 g**																			

Table B46 – Type III (>0.5) Main Zone core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.18	1.2	1.25	1.2	1.2	1.25	1.25	1.19	1.22	1.25	1.25	1.19	1.25	1.2	1.23	1.25	1.23	1.24
pH	---	7.12	3.18	3.84	6.72	4.74	6.67	6.46	4.33	6.15	5.89	3.52	3.57	6.87	6.67	6.86	6.54	6.92	6.32
Conductivity	mS/cm	0.02	0.13	0.06	0.01	0.01	0.04	0.00	0.01	0.05	0.01	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	3.2	24.4	6.8	2.2	4.6	2.2	2.6	3.4	<2	2.0	6.9	8.4	<2	<2	<2	<2	<2	2.1
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	9	<15	10.2	<15	3.9	<15	2.7	<15	3	<15	2.4	<15	2.4	<15	2.4	<15	2.1	<15
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.119	0.071	0.057	0.065	0.043	0.053	0.024	0.052	0.049	0.053	0.051	0.057	0.046	0.047	0.061	0.057	0.072	0.026
Antimony (Sb)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Arsenic (As)	mg/L	<0.001	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Ba)	mg/L	<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
Beryllium (Be)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	mg/L	0.00091	0.00152	0.00361	0.00103	0.00135	0.00112	0.00082	0.00079	0.00101	0.00196	0.00085	0.00093	0.00075	0.00065	0.00079	0.00123	0.00084	0.00056
Calcium (Ca)	mg/L	4.77	5.40	5.39	3.80	3.73	4.01	2.94	3.20	3.67	3.83	3.14	3.63	3.18	2.77	3.25	3.30	3.31	2.76
Chromium (Cr)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	mg/L	0.00592	0.00274	0.00191	<0.0005	0.00087	0.00093	0.00139	0.00075	<0.0005	<0.0005	0.00058	0.00059	<0.0005	<0.0005	0.00189	0.00061	<0.0005	0.00095
Copper (Cu)	mg/L	<0.001	0.0023	0.0013	<0.001	0.0013	0.0012	<0.001	0.0013	<0.001	0.0015	0.0010	<0.001	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	0.63	1.06	1.06	0.60	0.54	0.60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Manganese (Mn)	mg/L	0.0085	0.0137	0.0126	0.0066	0.0084	0.0076	0.0070	0.0055	0.0051	0.0056	0.0051	0.0048	0.0044	0.0042	0.0051	0.0041	0.0059	0.0047
Molybdenum (Mo)	mg/L	0.333	0.579	1.25	0.346	0.452	0.374	0.263	0.285	0.378	0.691	0.284	0.301	0.242	0.223	0.283	0.403	0.294	0.174
Nickel (Ni)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phosphorus (P)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	mg/L	1.1	1.2	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium (Se)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon (Si)	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	0.89	1.39	0.97	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/L	0.0596	0.0801	0.0696	0.0441	0.0426	0.0463	0.0370	0.0325	0.0357	0.0373	0.0298	0.0331	0.0295	0.0266	0.0275	0.0303	0.0278	0.0228
Sulphur (S)	mg/L	3	<5	3.4	<5	1.3	<5	0.9	<5	1	<5	0.8	<5	0.8	<5	0.8	<5	0.7	<5
Thallium (Tl)	mg/L	0.00049	0.00078	0.00112	0.00058	0.00073	0.00088	0.00053	0.00060	0.00038	0.00038	0.00043	0.00047	0.00034	0.00030	0.00050	0.00046	0.00040	0.00032
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Tungsten (W)	mg/L	<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
Uranium (U)	mg/L	<0.005	0.0070	0.0053	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	0.0082	0.0036	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0034	<0.003	0.0041	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Mass of Bottle	**273.31 g**																		
Mass of Bottle + Wasterock	**1273.67 g**																		

Table B47 – Type III (>0.5) Main Zone core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.24	1.25	1.24	1.25	1.23	1.28	1.25	1.19	1.25	1.21	1.25	1.29	1.19	1.24	1.26	1.2	1.26	1.23	1.23
pH	---	6.55	6.54	6.46	6.26	6.04	6.38	5.59	5.81	6.91	6.62	6.66	6.44	6.13	6.73	6.49	6.3	6.43	6.39	6.52
Conductivity	mS/cm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	<2	<2	<2	<2	<2	<2	<2	<2	2.1	2.6	2.2	2.2	2.2	2.8	2.2	2.2	2.2	3.0	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	1.59	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	1.62	<1.5	<1.5	<1.5
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0341	0.0256	0.0271	0.0313	0.0733	0.0321	0.0166	0.0315	0.0450	0.0331	0.0398	0.0343	0.0395	0.0529	0.0432	0.0319	0.0295	0.0293	0.0351
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00010	<0.0001	<0.0001	<0.0001	0.00012	<0.0001	<0.0001	<0.0001	<0.0001	0.00011	0.00025	0.00018	0.00012	0.00016	<0.0001	0.00015	<0.0001	<0.0001	<0.0001
Barium (Ba)	mg/L	0.00201	0.00179	0.00172	0.00170	0.00235	0.00223	0.00177	0.00171	0.00232	0.00210	0.00180	0.00201	0.00155	0.00217	0.00202	0.00143	0.00138	0.00117	0.00141
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	0.000027	0.000030	0.000024	0.000032	<0.00003	0.000027	<0.00001	<0.00002	<0.00005	<0.00003	<0.00002	<0.00004	0.000021	0.000018	<0.00002	0.000012	<0.00002	0.000010	0.000017
Calcium (Ca)	mg/L	3.23	2.71	2.63	2.69	2.89	3.20	2.16	2.45	3.40	3.22	2.68	3.36	2.35	3.32	3.49	2.76	3.25	2.67	2.90
Chromium (Cr)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012	0.00015	0.00011	0.00012	<0.0001	0.00010	0.00011	0.00018	0.00012	0.00017	0.00013	0.00014	0.00010	<0.0001
Cobalt (Co)	mg/L	0.00071	0.00056	0.00045	0.00048	0.00077	0.00043	0.00077	0.00039	0.00028	0.00037	0.00028	0.00028	0.00028	0.00025	0.00025	0.00031	0.00029	0.00035	0.00022
Copper (Cu)	mg/L	0.00063	0.00064	0.00094	0.00070	0.00130	0.00083	0.00102	0.00083	0.00089	0.00062	0.00081	0.00053	0.00071	0.00100	0.00073	0.00058	0.00064	0.00060	0.00056
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.023	0.029	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	0.000110	<0.00005	0.000102	0.000077	0.000797	0.000085	0.000059	0.000084	0.000091	0.000077	0.000083	0.000719	0.000126	0.000137	0.000135	0.000064	<0.00005	0.000062	0.000060
Magnesium (Mg)	mg/L	0.325	0.268	0.257	0.255	0.265	0.353	0.370	0.231	0.323	0.306	0.261	0.314	0.185	0.267	0.287	0.226	0.259	0.215	0.234
Manganese (Mn)	mg/L	0.00666	0.00396	0.00417	0.00368	0.00502	0.00430	0.00809	0.00335	0.00373	0.00421	0.00336	0.00426	0.00346	0.00409	0.00396	0.00396	0.00351	0.00382	0.00339
Molybdenum (Mo)	mg/L	0.156	0.156	0.130	0.130	0.116	0.151	0.00658	0.107	0.202	0.139	0.104	0.108	0.102	0.0784	0.110	0.0606	0.108	0.0519	0.0742
Nickel (Ni)	mg/L	<0.0005	<0.0005	0.00078	<0.0005	<0.0005	<0.0005	0.00081	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00058	0.00051	<0.0005	0.00050	<0.0005	<0.0005	<0.0005
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.279	0.209	0.211	0.231	0.225	0.282	0.269	0.200	0.262	0.248	0.197	0.242	0.146	0.203	0.223	0.191	0.182	0.154	0.197
Selenium (Se)	mg/L	0.00013	0.00012	0.00011	0.00010	<0.0001	0.00012	0.00023	<0.0001	0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon (Si)	mg/L	0.144	0.108	0.115	0.127	0.130	0.149	0.107	0.102	0.146	0.121	0.122	0.123	0.087	0.102	0.134	0.083	0.104	0.094	0.103
Silver (Ag)	mg/L	0.000012	<0.00001	<0.00001	<0.00001	0.000025	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.158	0.102	0.121	0.116	0.151	0.174	0.181	0.135	0.179	0.134	0.125	0.268	0.112	0.158	0.106	0.116	0.088	0.110	0.117
Strontium (Sr)	mg/L	0.0259	0.0208	0.0202	0.0195	0.0214	0.0270	0.0266	0.0178	0.0254	0.0226	0.0212	0.0243	0.0137	0.0206	0.0228	0.0147	0.0203	0.0181	0.0173
Sulphur (S)	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.53	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.54	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	0.00021	0.00023	0.00018	0.00018	0.00017	0.00021	<0.0001	0.00013	0.00017	0.00022	0.00015	0.00018	<0.0001	0.00011	0.00019	0.00012	0.00016	<0.0001	0.00013
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.00139	0.00167	0.00164	0.00152	0.00137	0.00162	0.00931	0.00149	0.00145	0.00160	0.00148	0.00122	0.00104	0.00149	0.00136	0.000903	0.00118	0.00118	0.000877
Vanadium (V)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Mass of Bottle **273.31 g**

Mass of Bottle + Wasterock **1273.67 g**

Table B48 – Type III (>250) Main Zone core sample humidity cell results, weeks 0 to 17.

Parameter	Units	Week																	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.1	1.1	1.1	1.2	1.2	1.2	1.17	1.16	1.3	1.11	1.4	1.2	1.1	1.3	1.25	1.14	1.25	1.27
pH	---	4.56	5.91	3.06	6.49	5.78	7.63	7.52	7.55	7.12	7.15	6.92	7.42	7.31	7.97	7.56	7.69	7.75	7.03
Conductivity	mS/cm	0.11	0.13	0.19	0.03	0.02	0.09	0.00	0.02	0.05	0.01	0.03	0.05	0.03	0.00	0.00	0.00	0.00	0.01
Acidity (as $CaCO_3$)	mg/L	7.8	5.6	30.8	2.4	4.0	2.2	-	2.4	<2	<2	2.6	10.4	<2	<2	<2	<2	<2	2.0
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	30.3	31.5	<15	8.4	6	4.8	4.2	4.2	3.9	3	3.3	2.4	2.4	2.7	1.8	1.8	1.8	1.8
DISSOLVED METALS																			
Aluminum (Al)	mg/L	0.048	0.04	<0.1	0.13	0.05	0.045	0.032	0.073	0.039	0.044	0.04	0.044	0.047	0.033	0.039	0.043	0.039	0.025
Antimony (Sb)	mg/L	<0.0005	<0.0005	<0.05	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic (As)	mg/L	0.003	0.003	<0.01	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.002	0.001	<0.001
Barium (Ba)	mg/L	0.014	0.008	<0.1	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	mg/L	0.051	0.059	<0.5	0.027	0.021	0.02	0.018	0.017	0.016	0.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium (Cd)	mg/L	<0.0001	<0.0001	0.0030	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (Ca)	mg/L	10	11	8.6	6.4	5.6	5.6	5.2	6.1	6.2	5.3	5.6	4.8	4.8	5.3	4.7	4.1	5.2	4.7
Chromium (Cr)	mg/L	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (Co)	mg/L	0.015	0.0076	0.0100	0.0095	0.002	0.0013	0.0012	0.001	0.0011	0.0008	0.0008	0.0007	0.0005	0.0007	0.0006	<0.0005	0.0006	0.0006
Copper (Cu)	mg/L	0.006	0.003	<0.01	0.007	0.002	<0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead (Pb)	mg/L	0.0008	0.0008	<0.01	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Magnesium (Mg)	mg/L	3.4	4	<5	2	1.7	1.7	1.5	1.6	1.6	1.3	1.4	1.2	1.1	1.2	1.1	0.89	1.1	1
Manganese (Mn)	mg/L	0.017	0.011	0.012	0.009	0.004	0.003	0.003	0.003	0.003	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Molybdenum (Mo)	mg/L	0.36	1.1	0.955	0.53	0.32	0.38	0.28	0.31	0.36	0.22	0.26	0.13	0.14	0.26	0.14	0.13	0.13	0.17
Nickel (Ni)	mg/L	0.016	0.007	<0.02	0.006	0.006	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (P)	mg/L	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Potassium (K)	mg/L	5.3	4.5	<10	2.7	2.2	2.1	1.8	1.9	1.8	1.5	1.4	1.3	1.2	1.1	0.91	0.85	0.95	0.76
Selenium (Se)	mg/L	0.006	0.012	<0.05	0.003	0.003	0.003	0.003	0.003	0.004	<0.002	0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Silicon (Si)	mg/L	0.84	1	<10	0.82	0.67	0.72	0.56	0.68	0.7	0.55	0.59	0.48	0.45	0.49	0.4	0.37	0.41	0.33
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium (Na)	mg/L	6.9	5.2	<5	1.4	1.1	0.67	0.45	0.59	0.37	0.29	0.31	0.24	0.25	0.23	0.15	0.19	0.18	0.12
Strontium (Sr)	mg/L	0.12	0.12	0.107	0.071	0.059	0.059	0.053	0.058	0.061	0.051	0.054	0.046	0.043	0.049	0.041	0.035	0.044	0.04
Sulphur (S)	mg/L	10.1	10.5	<50	2.8	2.0	1.6	1.4	1.4	1.3	1.0	1.1	0.8	0.8	0.9	0.6	0.6	0.6	0.6
Thallium (Tl)	mg/L	0.00011	0.00009	<0.003	0.00009	0.00005	0.00005	<0.00005	0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Tin (Sn)	mg/L	0.002	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	mg/L	<0.005	<0.005	<0.02	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tungsten (W)	mg/L	0.006	0.009	<0.1	0.007	0.007	0.008	0.007	0.008	0.009	0.006	0.007	0.005	0.005	0.006	0.005	0.003	0.005	0.004
Uranium (U)	mg/L	0.9	2.1	2.36	2.6	1.6	1.9	1.7	1.9	2.1	1.3	1.6	0.85	1.2	1.6	1.2	0.72	1.4	1.5
Vanadium (V)	mg/L	0.008	0.005	<0.01	0.008	0.005	0.005	0.003	0.004	0.004	0.005	0.004	0.004	0.003	0.003	0.003	0.004	0.003	0.002
Zinc (Zn)	mg/L	0.005	<0.005	<0.03	0.009	0.007	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zirconium (Zr)	mg/L	<0.001	<0.001	<0.04	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mass of Bottle	**273.93 g**																		
Mass of Bottle + Wasterock	**1274.35 g**																		

Table B49 – Type III (>250) Main Zone core sample humidity cell results, weeks 18 to 36.

Parameter	Units	Week																		
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Volume Water Added	L	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L	1.22	1.19	1.3	1.23	1.29	1.15	1.2	1.35	1.2	1.3	1.3	1.26	1.24	1.27	1.28	1.23	1.28	1.26	1.26
pH	---	6.64	7.2	7.55	7.12	6.63	7.2	3.43	7.18	7.2	7.09	6.96	6.68	7.16	7.53	6.86	6.68	6.7	7.1	7.33
Conductivity	mS/cm	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Acidity (as $CaCO_3$)	mg/L	<2	2.2	<2	<2	<2	<2	4.8	<2	<2	3.4	2.2	3.5	<2	2.2	<2	<2	2.6	3.4	<2
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO_4)	mg/L	<1.5	<1.5	1.86	1.71	2.52	1.65	4.35	<1.5	<1.5	<1.5	<1.5	1.74	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
DISSOLVED METALS																				
Aluminum (Al)	mg/L	0.0423	0.0227	0.0306	0.0687	0.522	0.0357	0.0290	0.0263	0.0452	0.0286	0.0326	0.0348	0.0246	0.126	0.0422	0.0410	0.0417	0.129	0.0334
Antimony (Sb)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic (As)	mg/L	0.00105	0.00077	0.00098	0.00084	0.00076	0.00087	0.00108	0.00075	0.00063	0.00076	0.00090	0.00082	0.00047	0.00073	0.00074	0.00055	0.00054	0.00042	0.00062
Barium (Ba)	mg/L	0.00203	0.00206	0.00238	0.00225	0.00319	0.00214	0.00260	0.00221	0.00174	0.00218	0.00185	0.00199	0.00145	0.00232	0.00213	0.00168	0.00145	0.00121	0.00156
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	<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
Cadmium (Cd)	mg/L	<0.00001	0.000014	0.000021	0.000020	<0.00002	0.000015	<0.00003	<0.00003	0.000018	0.000013	0.000015	0.000018	<0.00001	0.000015	0.000010	<0.00001	<0.00001	<0.00001	<0.00001
Calcium (Ca)	mg/L	4.08	3.74	5.06	4.28	5.67	4.63	5.57	4.53	3.56	4.45	3.94	4.61	3.07	4.37	5.05	3.13	4.70	3.69	4.08
Chromium (Cr)	mg/L	0.00012	0.00012	<0.0001	0.00013	0.00019	0.00014	0.00020	0.00015	0.00016	<0.0001	0.00013	0.00011	0.00011	0.00014	0.00013	0.00016	0.00014	0.00012	0.00025
Cobalt (Co)	mg/L	0.00049	0.00057	0.00056	0.00042	0.00046	0.00041	0.00072	0.00056	0.00044	0.00049	0.00044	0.00050	0.00037	0.00030	0.00038	0.00030	0.00037	0.00031	0.00031
Copper (Cu)	mg/L	0.00099	0.00059	0.00066	0.00087	0.00093	0.00144	0.00091	0.00081	0.00113	0.00054	0.00056	<0.0005	0.00069	0.00127	0.00058	<0.0005	0.00055	<0.0005	<0.0005
Iron (Fe)	mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	0.000141	0.000071	0.000150	0.000188	0.000160	0.000279	0.000268	0.000095	0.000315	0.000102	0.000118	0.000151	0.000081	0.000223	0.000159	0.000063	0.000119	0.000087	0.000088
Magnesium (Mg)	mg/L	0.912	0.814	0.979	0.844	0.880	0.900	0.949	0.914	0.652	0.881	0.764	0.771	0.542	0.693	0.785	0.576	0.705	0.570	0.629
Manganese (Mn)	mg/L	0.00183	0.00188	0.00235	0.00205	0.00411	0.00219	0.00290	0.00250	0.00198	0.00227	0.00222	0.00323	0.00215	0.00255	0.00289	0.00234	0.00246	0.00260	0.00290
Molybdenum (Mo)	mg/L	0.0650	0.0900	0.0994	0.0606	0.0550	0.0879	0.106	0.0935	0.0441	0.0685	0.0775	0.0821	0.0415	0.0504	0.0686	0.0299	0.0555	0.0428	0.0363
Nickel (Ni)	mg/L	0.00077	0.00055	0.00069	0.00071	0.00062	<0.0005	0.00073	0.00083	0.00056	0.00135	0.00104	0.00059	0.00091	0.00069	0.00102	0.00167	0.00057	<0.0005	<0.0005
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)	mg/L	0.711	0.550	0.667	0.745	0.765	0.616	0.618	0.561	0.490	0.541	0.437	0.429	0.338	0.410	0.439	0.364	0.335	0.364	0.386
Selenium (Se)	mg/L	0.00092	0.00081	0.00102	0.00092	0.00074	0.00090	0.00087	0.00077	0.00063	0.00084	0.00075	0.00070	0.00051	0.00054	0.00065	0.00041	0.00056	0.00045	0.00054
Silicon (Si)	mg/L	0.355	0.284	0.360	0.351	0.332	0.339	0.329	0.303	0.267	0.300	0.280	0.268	0.192	0.240	0.281	0.166	0.235	0.189	0.221
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)	mg/L	0.187	0.116	0.141	0.244	0.640	0.190	0.211	0.161	0.222	0.145	0.126	0.146	0.111	0.172	0.112	0.121	0.102	0.212	0.204
Strontium (Sr)	mg/L	0.0370	0.0335	0.0412	0.0338	0.0364	0.0371	0.0381	0.0360	0.0279	0.0363	0.0331	0.0349	0.0250	0.0295	0.0341	0.0225	0.0299	0.0262	0.0245
Sulphur (S)	mg/L	<0.5	<0.5	0.62	0.57	0.84	0.55	1.45	<0.5	<0.5	<0.5	<0.5	0.58	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<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
Tungsten (W)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/L	0.936	0.984	1.29	0.958	1.04	1.04	1.40	1.27	0.664	1.14	1.09	1.08	0.771	0.985	1.09	0.592	1.11	0.771	0.743
Vanadium (V)	mg/L	0.0026	0.0018	0.0024	0.0024	0.0020	0.0028	0.0021	0.0021	0.0020	0.0023	0.0020	0.0019	0.0016	0.0018	0.0022	0.0017	0.0018	0.0015	0.0019
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	0.0034	0.0128	<0.003	0.0036	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0042	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass of Bottle	**273.93 g**																			
Mass of Bottle + Wasterock	**1274.35 g**																			

Table B50 – Andrew Lake waste rock column results, weeks 0 to 17.

Parameter	Units	ANDW - SW																	
Sample Day		0	3	10	17	25	31	38	45	52	59	66	73	81	87	95	102	109	116
Sample Week		0.0	0.4	1.4	2.4	3.6	4.4	5.4	6.4	7.4	8.4	9.4	10.4	11.6	12.4	13.6	14.6	15.6	16.6
Volume Removed	L	0.12	0.12	0.12	1.32	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
pH	---	5.88	6.59	6.74	6.78	6.82	6.62	6.80	6.89	6.91	6.92	7.04	6.91	6.97	7.02	6.90	6.86	6.82	6.90
Conductivity	mS/cm	1.68	2.16	2.25	2.13	1.52	1.17	1.15	0.98	0.76	0.49	0.49	0.37	0.31	0.09	0.20	0.16	0.13	0.11
Sulphate (SO_4)	mg/L	38.4	49.5	56.7	56.7	42	33	33.6	27.39	22.65	19.44	17.34	14.79	12.63	10.83	10.11	9.48	8.79	7.83
Calcium (Ca)	mg/L	260	290	300	291	222	167	163	119	89.0	71.3	54.6	45.6	34.5	32.3	26.0	21.3	14.0	11.9
Magnesium (Mg)	mg/L	65	75	80	76.1	53.2	40.5	38.8	31.1	23.7	20.3	13.5	11.8	9.16	7.35	5.94	5.35	3.95	3.19
Potassium (K)	mg/L	68	74	74	75.3	60.3	51.4	50.1	42.5	36.6	34.8	28.0	24.8	22.1	19.5	17.8	16.4	12.7	12.4
Sodium (Na)	mg/L	21	23	25	23.7	17.1	13.6	13.4	10.8	8.73	7.99	6.08	5.30	4.58	3.75	3.27	3.14	2.46	2.15
Dissolved Metals																			
Aluminum (Al)	mg/L	0.008	0.008	0.008	0.0070	0.0083	0.0093	0.0087	0.0077	0.0082	0.0115	0.0097	0.0109	0.0120	0.0145	0.0190	0.0317	0.0249	0.0280
Antimony (Sb)	mg/L	0.0006	0.0006	0.0012	0.00057	0.00045	0.00044	0.00044	0.00045	0.00051	0.00044	0.00047	0.00045	0.00049	0.00048	0.00054	0.00051	0.00053	0.00057
Arsenic (As)	mg/L	0.003	0.004	0.005	0.00622	0.00354	0.00456	0.00324	0.00323	0.00459	0.00275	0.00250	0.00219	0.00188	0.00196	0.00207	0.00230	0.00225	0.00216
Barium (Ba)	mg/L	0.17	0.23	0.24	0.245	0.167	0.125	0.124	0.0944	0.0707	0.0544	0.0419	0.0328	0.0253	0.0207	0.0170	0.0150	0.0104	0.00804
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	1.1	1.7	2.2	2.26	2.14	1.89	2.10	1.60	1.48	1.38	1.28	1.09	1.06	0.941	0.890	0.769	0.670	0.745
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	0.000028	0.000018	0.000033	0.000086	<0.00003	<0.00003	<0.00002	<0.00003	<0.00003	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.000015
Chromium (Cr)	mg/L	0.006	<0.005	<0.005	<0.0002	0.00010	<0.0001	<0.0001	<0.0001	<0.0001	0.00016	0.00013	<0.0001	0.00012	0.00017	0.00016	0.00019	0.00025	0.00023
Cobalt (Co)	mg/L	<0.0005	<0.0005	<0.001	0.00045	0.00032	0.00032	0.00022	0.00019	0.00013	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Copper (Cu)	mg/L	0.001	0.001	0.002	<0.001	0.00088	0.00139	0.00094	<0.0005	<0.0005	0.00055	<0.0005	<0.0005	<0.0005	0.00052	<0.0005	<0.0005	<0.0005	<0.0005
Iron (Fe)	mg/L	<0.1	<0.1	<0.1	<0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (Pb)	mg/L	<0.0005	<0.0005	<0.0005	<0.0001	0.000057	<0.00005	0.000160	<0.00005	0.000126	0.000069	<0.00005	0.000061	<0.00005	<0.00005	<0.00005	0.000053	0.000061	0.000056
Lithium (Li)	mg/L	0.49	0.57	0.59	0.539	0.416	0.332	0.336	0.272	0.224	0.191	0.176	0.151	0.137	0.108	0.0961	0.0872	0.0654	0.0705
Manganese (Mn)	mg/L	0.1	0.14	0.19	0.203	0.140	0.103	0.102	0.0790	0.0613	0.0598	0.0424	0.0328	0.0265	0.0216	0.0182	0.0155	0.0113	0.00964
Molybdenum (Mo)	mg/L	0.037	0.059	0.083	0.0877	0.0882	0.0759	0.0967	0.0999	0.107	0.102	0.109	0.102	0.105	0.101	0.104	0.0944	0.0926	0.0921
Nickel (Ni)	mg/L	0.012	0.009	0.008	0.0070	0.00519	0.00433	0.00354	0.00276	0.00226	0.00172	0.00145	0.00114	0.00094	0.00091	0.00076	0.00074	0.00075	0.00055
Phosphorus (P)	mg/L	<0.1	<0.1	<0.1	<0.6	<0.3	<0.3	<0.3	<0.30	<0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Selenium (Se)	mg/L	0.009	0.011	0.011	0.0107	0.00770	0.00595	0.00610	0.00564	0.00491	0.00422	0.00400	0.00355	0.00327	0.00297	0.00301	0.00301	0.00289	0.00273
Silicon (Si)	mg/L	3.3	5.5	7.1	8.26	7.98	7.55	8.32	7.78	7.80	7.78	7.84	7.48	7.59	7.00	6.99	6.55	6.30	6.39
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.00002	<0.00001	<0.00001	0.000040	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Strontium (Sr)	mg/L	3	3.5	3.6	3.49	2.37	1.77	1.74	1.39	1.05	0.823	0.649	0.521	0.410	0.330	0.270	0.203	0.171	0.144
Sulphur (S)	mg/L	12.8	16.5	18.9	18.9	14.0	11.0	11.2	9.13	7.55	6.48	5.78	4.93	4.21	3.61	3.37	3.16	2.93	2.61
Tellurium (Te)	mg/L	<0.001	<0.001	<0.001															
Thallium (Tl)	mg/L	0.00006	0.00007	0.00008	<0.0002	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (Th)	mg/L	<0.001	<0.001	<0.001															
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (Ti)	mg/L	<0.005	<0.005	<0.005	<0.02	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tungsten (W)	mg/L	<0.001	<0.001	<0.001															
Uranium (U)	mg/L	0.21	0.76	2.3	2.66	2.14	1.09	2.16	2.02	1.98	1.84	1.65	1.56	1.39	1.19	1.08	0.873	0.800	0.733
Vanadium (V)	mg/L	0.008	0.008	0.006	0.0056	0.0052	0.0053	0.0058	0.0054	0.0055	0.0063	0.0055	0.0054	0.0057	0.0055	0.0056	0.0063	0.0057	0.0055
Zinc (Zn)	mg/L	<0.005	<0.005	<0.005	<0.006	<0.003	0.0033	<0.003	<0.0030	<0.0030	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0046	<0.003
Zirconium (Zr)	mg/L	<0.001	<0.001	<0.001															

Table B51 – Andrew Lake laboratory waste rock column results, weeks 18 to 46.

Parameter	Units	ANDW-SW																
Sample Day		123	130	137	146	151	158	165	179	193	210	221	235	252	270	291	305	319
Sample Week		17.6	18.6	19.6	20.9	21.6	22.6	23.6	25.6	27.6	30.0	31.6	33.6	36.0	38.6	41.6	43.6	45.6
Volume Removed	L	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
pH	---	6.94	6.76	6.94	6.92	6.92	6.91	6.92	6.87	6.99	7.45	7.28	7.48	7.43	7.47	7.60	7.34	7.37
Conductivity	mS/cm	0.11	0.08	0.08	0.09	0.07	0.05	0.05	0.05	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.05	0.06
Sulphate (SO_4)	mg/L	7.59	6.99	6.54	6.96	6.66	5.7	5.16	5.85	6.12	6.33	5.94	5.46	5.7				
Calcium (Ca)	mg/L	10.3	8.40	7.61	6.52	6.18	6.03	4.87	4.83	4.37	4.78	4.28	4.52	4.86				
Magnesium (Mg)	mg/L	2.81	2.17	2.06	1.69	1.61	1.52	1.31	1.32	1.20	1.23	1.09	1.19	1.16				
Potassium (K)	mg/L	12.4	10.0	10.1	8.31	8.51	8.27	7.99	7.15	7.08	7.06	6.76	7.84	6.75				
Sodium (Na)	mg/L	2.21	1.71	1.71	1.50	1.46	1.45	1.28	1.92	1.22	1.25	1.15	1.19	1.37				
Dissolved Metals																		
Aluminum (Al)	mg/L	0.0458	0.0680	0.0312	0.0381	0.0870	0.0374	0.0466	0.0590	0.0741	0.0948	0.0184	0.0995	0.0689				
Antimony (Sb)	mg/L	0.00055	0.00064	0.00066	0.00062	0.00069	0.00068	0.00065	0.00075	0.00071	0.00075	0.00073	0.00072	0.00074				
Arsenic (As)	mg/L	0.00399	0.00243	0.00275	0.00275	0.00280	0.00296	0.00326	0.00297	0.00301	0.00313	0.00315	0.00330	0.00341				
Barium (Ba)	mg/L	0.00759	0.00609	0.00526	0.00428	0.00425	0.00383	0.00347	0.00322	0.00315	0.00326	0.00276	0.00326	0.00298				
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001				
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Boron (B)	mg/L	0.613	0.529	0.625	0.585	0.586	0.525	0.475	0.532	0.486	0.510	0.435	0.497	0.467				
Cadmium (Cd)	mg/L	0.000020	0.000013	0.000018	0.000016	0.000020	0.000012	0.000012	0.000015	0.000022	0.000014	0.000014	<0.00002	0.000010				
Chromium (Cr)	mg/L	0.00052	0.00135	0.00050	0.00055	0.00089	0.00066	0.00068	0.00090	0.00062	0.00094	0.00036	0.00079	0.00087				
Cobalt (Co)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00021				
Copper (Cu)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Iron (Fe)	mg/L	<0.01	0.034	<0.01	<0.01	0.022	<0.01	0.012	0.014	0.020	0.026	<0.01	0.019	0.027				
Lead (Pb)	mg/L	0.000075	0.000131	0.000114	0.000073	0.000164	0.000071	0.000094	0.000235	0.000140	0.000264	<0.00005	0.000190	0.000188				
Lithium (Li)	mg/L	0.0592	0.0573	0.0541	0.0539	0.0513	0.0466	0.0405	0.0455	0.0398	0.0419	0.0379	0.0397	0.0387				
Manganese (Mn)	mg/L	0.00916	0.00671	0.00631	0.00506	0.00500	0.00454	0.00432	0.00386	0.00367	0.00377	0.00338	0.00393	0.0112				
Molybdenum (Mo)	mg/L	0.0787	0.0874	0.0879	0.0817	0.0757	0.0751	0.0631	0.0697	0.0689	0.0655	0.0628	0.0598	0.0622				
Nickel (Ni)	mg/L	0.00064	0.00052	<0.0005	0.00052	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00069	<0.0005	<0.0005	0.00067				
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				
Selenium (Se)	mg/L	0.00290	0.00291	0.00298	0.00307	0.00332	0.00344	0.00328	0.00353	0.00373	0.00343	0.00378	0.00368	0.00413				
Silicon (Si)	mg/L	6.85	6.39	6.78	6.76	6.55	7.16	6.83	7.43	6.81	6.87	6.64	7.02	7.16				
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000028	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001				
Strontium (Sr)	mg/L	0.108	0.102	0.0894	0.0780	0.0682	0.0638	0.0528	0.0588	0.0539	0.0539	0.0472	0.0494	0.0479				
Sulphur (S)	mg/L	2.53	2.33	2.18	2.32	2.22	1.90	1.72	1.95	2.04	2.11	1.98	1.82	1.90				
Tellurium (Te)	mg/L																	
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Thorium (Th)	mg/L																	
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Titanium (Ti)	mg/L	<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				
Tungsten (W)	mg/L																	
Uranium (U)	mg/L	0.652	0.701	0.671	0.621	0.598	0.539	0.447	0.531	0.526	0.524	0.464	0.497	0.468				
Vanadium (V)	mg/L	0.0074	0.0064	0.0067	0.0065	0.0077	0.0075	0.0076	0.0068	0.0070	0.0072	0.0066	0.0083	0.0070				
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0058				
Zirconium (Zr)	mg/L																	

Table B52 – Main Zone waste rock column results, weeks 0 to 17.

Parameter	Units	MZ - SW																	
Sample Day		0	3	10	17	25	31	38	45	52	59	66	73	81	87	95	102	109	116
Sample Week		0.0	0.4	1.4	2.4	3.6	4.4	5.4	6.4	7.4	8.4	9.4	10.4	11.6	12.4	13.6	14.6	15.6	16.6
Volume Removed	L	0.12	0.12	0.12	1.32	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
pH	---	6.78	7.17	7.08	7.35	7.48	7.38	7.40	7.50	7.41	7.53	7.48	7.21	7.29	7.45	7.36	7.34	7.32	7.29
Conductivity	mS/cm	0.18	0.34	0.37	0.35	0.28	0.23	0.19	0.18	0.16	0.10	0.13	0.11	0.12	0.09	0.10	0.08	0.08	0.08
Sulphate (SO_4)	mg/L	48.6	100.2	100.2	110.4	80.4	62.4	50.4	39.6	33	27.66	23.25	20.31	17.25	14.85	13.68	12.99	12.12	10.83
Calcium (Ca)	mg/L	12	28	37	41.3	33.6	28.2	25.9	21.4	19.6	18.1	16.2	15.5	13.7	14.8	13.9	12.5	10.1	10.1
Magnesium (Mg)	mg/L	6.5	14	17	17.1	13.9	11.5	10.1	9.01	8.12	7.74	6.08	6.27	5.64	5.27	5.11	4.98	4.41	4.41
Potassium (K)	mg/L	9.4	14	15	15.6	13.8	12.4	11.2	10.6	10.0	9.61	8.47	8.39	7.75	7.45	7.67	7.22	6.39	6.40
Sodium (Na)	mg/L	10	17	18	16.7	13.8	11.7	10.3	8.90	8.08	7.75	6.70	6.17	5.63	5.03	4.67	4.66	4.09	3.81
Dissolved Metals																			
Aluminum (Al)	mg/L	0.083	0.067	0.095	0.0208	0.0187	0.0286	0.0268	0.0348	0.0285	0.0880	0.0487	0.0808	0.156	0.245	0.253	0.257	0.237	0.170
Antimony (Sb)	mg/L	<0.0005	<0.0005	0.0007	0.00037	0.00036	0.00034	0.00034	0.00036	0.00036	0.00035	0.00036	0.00037	0.00037	0.00037	0.00039	0.00039	0.00036	0.00038
Arsenic (As)	mg/L	0.007	0.01	0.012	0.0127	0.0108	0.00999	0.0104	0.00954	0.00893	0.00873	0.00783	0.00739	0.00653	0.00604	0.00584	0.00543	0.00518	0.00470
Barium (Ba)	mg/L	<0.005	0.01	0.013	0.0140	0.0108	0.00876	0.00796	0.00687	0.00594	0.00539	0.00481	0.00438	0.00420	0.00387	0.00395	0.00360	0.00292	0.00289
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)	mg/L	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)	mg/L	0.26	0.5	0.68	0.768	0.689	0.631	0.585	0.456	0.423	0.422	0.394	0.334	0.324	0.295	0.294	0.260	0.222	0.249
Cadmium (Cd)	mg/L	<0.0001	<0.0001	<0.0001	<0.0002	0.000142	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015	0.000144	<0.0001	<0.00008	<0.00007	<0.00005	<0.00007	<0.00006
Chromium (Cr)	mg/L	<0.005	<0.005	<0.005	<0.0001	0.00018	<0.0001	<0.0001	0.00010	0.00012	0.00016	<0.0002	0.00019	0.00042	0.00038	0.00028	0.00024	0.00029	0.00031
Cobalt (Co)	mg/L	0.0005	0.0009	0.0008	0.00059	0.00035	0.00026	0.00024	0.00017	0.00016	0.00016	<0.0002	0.00011	<0.0001	0.00011	0.00011	<0.0001	<0.0001	<0.0001
Copper (Cu)	mg/L	0.004	0.006	0.004	0.00149	0.00106	0.00112	0.00106	0.00095	0.00087	0.00077	<0.001	0.00064	0.00066	0.00096	0.00055	0.00071	0.00080	0.00080
Iron (Fe)	mg/L	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.030	<0.030	<0.03	<0.06	<0.03	0.022	0.033	0.029	0.015	0.023	0.020
Lead (Pb)	mg/L	<0.0005	0.0007	0.0009	0.000793	0.000578	0.000507	0.000535	0.000376	0.000563	0.000552	0.00045	0.000485	0.000570	0.000577	0.000587	0.000437	0.000423	0.000353
Lithium (Li)	mg/L	0.07	0.12	0.13	0.130	0.106	0.0911	0.0830	0.0689	0.0621	0.0583	0.055	0.0535	0.0518	0.0442	0.0444	0.0426	0.0330	0.0377
Manganese (Mn)	mg/L	0.01	0.024	0.041	0.0419	0.0340	0.0292	0.0252	0.0221	0.0192	0.0191	0.0164	0.0156	0.0141	0.0125	0.0123	0.0112	0.00976	0.00904
Molybdenum (Mo)	mg/L	0.38	0.77	1.1	1.13	1.01	0.886	0.861	0.824	0.746	0.697	0.699	0.601	0.540	0.479	0.461	0.407	0.364	0.347
Nickel (Ni)	mg/L	0.011	0.02	0.025	0.0241	0.0187	0.0145	0.0127	0.0103	0.00735	0.00613	0.0054	0.00431	0.00361	0.00359	0.00277	0.00242	0.00217	0.00216
Phosphorus (P)	mg/L	0.21	0.27	0.21	<0.3	<0.3	<0.3	<0.3	<0.30	<0.30	<0.3	<0.6	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Selenium (Se)	mg/L	0.026	0.043	0.046	0.0463	0.0358	0.0294	0.0245	0.0219	0.0196	0.0167	0.0155	0.0148	0.0133	0.0126	0.0133	0.0126	0.0124	0.0120
Silicon (Si)	mg/L	3.5	6.4	7.3	7.26	6.73	6.53	6.39	5.95	5.77	5.74	5.59	5.49	5.50	5.24	5.41	4.69	4.67	4.82
Silver (Ag)	mg/L	<0.0001	<0.0001	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Strontium (Sr)	mg/L	0.14	0.3	0.41	0.417	0.331	0.271	0.244	0.218	0.193	0.172	0.163	0.149	0.139	0.126	0.126	0.114	0.107	0.103
Sulphur (S)	mg/L	16.2	33.4	33.4	36.8	26.8	20.8	16.8	13.2	11.0	9.22	7.75	6.77	5.75	4.95	4.56	4.33	4.04	3.61
Tellurium (Te)	mg/L	<0.001	<0.001	<0.001															
Thallium (Tl)	mg/L	<0.00005	0.00005	0.00007	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (Th)	mg/L	<0.001	<0.001	<0.001															
Tin (Sn)	mg/L	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012	0.00012
Titanium (Ti)	mg/L	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tungsten (W)	mg/L	0.004	0.006	0.005															
Uranium (U)	mg/L	1.9	12	30	35.2	31.7	26.6	26.3	24.8	22.5	20.6	20.1	18.8	17.1	14.8	14.9	12.9	11.2	10.4
Vanadium (V)	mg/L	0.006	0.006	0.004	0.0030	0.0024	0.0022	0.0021	0.0020	0.0018	0.0019	<0.002	0.0018	0.0020	0.0022	0.0021	0.0018	0.0017	0.0016
Zinc (Zn)	mg/L	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.0030	<0.0030	<0.003	<0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zirconium (Zr)	mg/L	<0.001	<0.001	<0.001															

Table B53 – Main Zone laboratory waste rock column results, weeks 18 to 46.

Parameter	Units	MZ-SW																
Sample Day		123	130	137	146	151	158	165	179	193	210	221	235	252	270	291	305	319
Sample Week		17.6	18.6	19.6	20.9	21.6	22.6	23.6	25.6	27.6	30.0	31.6	33.6	36.0	38.6	41.6	43.6	45.6
Volume Removed	L	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
pH	---	7.28	7.30	7.22	7.24	7.28	7.24	7.29	7.11	7.23	7.94	7.81	7.95	7.82	7.72	7.77	7.71	7.67
Conductivity	mS/cm	0.08	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.09	0.08	0.08	0.08	0.09	0.08	0.08
Sulphate (SO_4)	mg/L	9.48	8.79	7.98	8.19	7.17	6.42	5.91	6.42	6.57	6.81	6.27	5.82	5.79				
Calcium (Ca)	mg/L	9.84	8.79	8.79	8.09	7.51	7.23	6.54	7.53	6.82	7.98	7.00	6.76	6.70				
Magnesium (Mg)	mg/L	4.01	3.50	3.71	3.44	3.27	3.23	2.94	3.06	3.00	3.19	3.03	3.09	3.20				
Potassium (K)	mg/L	6.71	5.74	6.12	5.69	5.71	5.52	5.45	5.20	5.36	5.28	5.33	5.34	5.34				
Sodium (Na)	mg/L	3.77	3.28	3.23	2.80	2.65	2.54	2.35	2.36	2.24	2.37	2.16	2.13	2.03				
Dissolved Metals																		
Aluminum (Al)	mg/L	0.0395	0.409	0.152	0.0662	0.124	0.106	0.107	0.111	0.0371	0.0980	0.0279	0.0295	0.0458				
Antimony (Sb)	mg/L	0.00035	0.00038	0.00041	0.00037	0.00038	0.00037	0.00042	0.00040	0.00037	0.00045	0.00044	0.00038	0.00039				
Arsenic (As)	mg/L	0.00479	0.00407	0.00439	0.00381	0.00350	0.00344	0.00328	0.00309	0.00293	0.00279	0.00278	0.00277	0.00285				
Barium (Ba)	mg/L	0.00261	0.00281	0.00243	0.00213	0.00211	0.00182	0.00194	0.00197	0.00185	0.00196	0.00182	0.00190	0.00178				
Beryllium (Be)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001				
Bismuth (Bi)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Boron (B)	mg/L	0.195	0.182	0.215	0.199	0.196	0.178	0.181	0.156	0.166	0.181	0.157	0.167	0.144				
Cadmium (Cd)	mg/L	0.000055	0.000047	<0.00005	<0.00005	<0.00007	0.000039	0.000032	<0.00005	0.000076	<0.00006	<0.00006	<0.00007	0.000045				
Chromium (Cr)	mg/L	0.00038	0.00088	0.00057	0.00046	0.00050	0.00051	0.00047	0.00050	0.00033	0.00032	0.00023	0.00014	0.00049				
Cobalt (Co)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Copper (Cu)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00061	<0.0005	0.00065	<0.0005	<0.0005				
Iron (Fe)	mg/L	<0.01	0.068	0.021	<0.01	0.015	<0.01	0.011	0.014	<0.01	0.013	<0.010	<0.01	<0.01				
Lead (Pb)	mg/L	0.000174	0.000785	0.000399	0.000266	0.000258	0.000220	0.000405	0.000363	0.000170	0.000436	0.000160	0.000151	0.000275				
Lithium (Li)	mg/L	0.0337	0.0328	0.0335	0.0342	0.0330	0.0320	0.0305	0.0296	0.0284	0.0309	0.0289	0.0286	0.0308				
Manganese (Mn)	mg/L	0.00893	0.00751	0.00758	0.00678	0.00642	0.00605	0.00563	0.00581	0.00553	0.00591	0.00568	0.00566	0.00535				
Molybdenum (Mo)	mg/L	0.264	0.272	0.266	0.251	0.226	0.223	0.209	0.232	0.227	0.261	0.244	0.257	0.255				
Nickel (Ni)	mg/L	0.00175	0.00170	0.00148	0.00122	0.00107	0.00109	0.00098	0.00096	0.00083	0.00087	0.00075	0.00074	0.00075				
Phosphorus (P)	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				
Selenium (Se)	mg/L	0.0115	0.0115	0.0106	0.0107	0.0101	0.00918	0.00984	0.00955	0.00922	0.00832	0.00866	0.00786	0.00796				
Silicon (Si)	mg/L	4.70	4.92	4.73	4.59	4.40	4.50	4.69	4.43	4.15	4.16	4.15	4.17	4.29				
Silver (Ag)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001				
Strontium (Sr)	mg/L	0.0834	0.0863	0.0865	0.0836	0.0760	0.0732	0.0708	0.0758	0.0726	0.0776	0.0706	0.0721	0.0668				
Sulphur (S)	mg/L	3.16	2.93	2.66	2.73	2.39	2.14	1.97	2.14	2.19	2.27	2.09	1.94	1.93				
Tellurium (Te)	mg/L																	
Thallium (Tl)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.000025				
Thorium (Th)	mg/L																	
Tin (Sn)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Titanium (Ti)	mg/L	<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				
Tungsten (W)	mg/L																	
Uranium (U)	mg/L	7.81	7.82	7.53	6.84	5.42	5.00	4.40	4.56	3.97	4.48	3.84	3.42	3.01				
Vanadium (V)	mg/L	0.0013	0.0024	0.0017	0.0013	0.0015	0.0012	0.0014	0.0013	0.0011	0.0014	0.0012	0.0012	0.0012				
Zinc (Zn)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Zirconium (Zr)	mg/L																	

ATTACHMENT C – COPC LEACH DATA TABLES

Table C1 - Summary of the mass of Cadmium leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	<0.02	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	0.02	<	<	<	<
ANDW-07-01 (200-200.5)	3:1	0.02	<	<	<	<
ANDW-07-01 (255-255.5)	20:1	<0.02	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	<0.02	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	0.02	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	0.02	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	0.02	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	<0.02	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	<0.02	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	<0.02	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	<0.02	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	0.02	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	0.02	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	<0.02	<	<	<	<
MZ-07-01 (20-20.5)	20:1	<0.02	<	<	<	<
MZ-07-01 (50-50.5)	20:1	<0.02	<	<	<	<
MZ-07-01 (94-94.5)	20:1	<0.02	<	<	<	<
MZ-07-01 (94-94.5)	3:1	<0.02	<	<	<	<
MZ-07-01 (105-105.5)	20:1	<0.02	<	<	<	<
MZ-07-03 (55-55.5)	20:1	<0.02	<	<	<	<
MZ-07-03 (100-100.5)	20:1	<0.02	<	<	<	<
MZ-07-03 (170-170.5)	20:1	<0.02	<	<	<	<
MZ-07-03 (170-170.5)	3:1	<0.02	<	<	<	<
MZ-07-03 (195-195.5)	20:1	<0.02	<	<	<	<
MZ-07-04 (20-20.5)	20:1	<0.02	<	<	<	<
MZ-07-04 (20-20.5)	3:1	<0.02	0.0019	0.0019	<	<
MZ-07-04 (30-30.5)	20:1	<0.02	<	<	<	<
MZ-07-04 (40-40.5)	20:1	<0.02	<	<	<	<
MZ-07-05 (31-31.5)	20:1	<0.02	<	<	<	<
MZ-07-05 (31-31.5)	3:1	<0.02	0.0003	0.0003	<	<
MZ-07-05 (38-38.5)	20:1	<0.02	<	<	<	<
MZ-07-05 (55-55.5)	20:1	0.08	<	<	<	<

Notes:

1 - Indicates the residual Cd content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C2 - Summary of the mass of Cobalt leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	6.4	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	2	<	<	<	<
ANDW-07-01 (200-200.5)	3:1	2	0.002	0.002	0.1%	0.1%
ANDW-07-01 (255-255.5)	20:1	4.7	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	6.4	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	25	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	25	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	4.8	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	2.3	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	2.3	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	8	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	1.3	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	11.1	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	11.1	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	9.9	<	<	<	<
MZ-07-01 (20-20.5)	20:1	13.2	<	<	<	<
MZ-07-01 (50-50.5)	20:1	5.4	<	<	<	<
MZ-07-01 (94-94.5)	20:1	6.8	<	<	<	<
MZ-07-01 (94-94.5)	3:1	6.8	<	<	<	<
MZ-07-01 (105-105.5)	20:1	8.3	<	<	<	<
MZ-07-03 (55-55.5)	20:1	13.7	<	<	<	<
MZ-07-03 (100-100.5)	20:1	11	<	<	<	<
MZ-07-03 (170-170.5)	20:1	31.5	<	<	<	<
MZ-07-03 (170-170.5)	3:1	31.5	<	<	<	<
MZ-07-03 (195-195.5)	20:1	6.9	<	<	<	<
MZ-07-04 (20-20.5)	20:1	5.6	0.02	0.88	0.4%	13.5%
MZ-07-04 (20-20.5)	3:1	5.6	0.006	0.006	0.1%	0.1%
MZ-07-04 (30-30.5)	20:1	6.1	<	<	<	<
MZ-07-04 (40-40.5)	20:1	23	<	<	<	<
MZ-07-05 (31-31.5)	20:1	10.4	<	<	<	<
MZ-07-05 (31-31.5)	3:1	10.4	0.002	0.002	0.0%	0.0%
MZ-07-05 (38-38.5)	20:1	5.6	<	<	<	<
MZ-07-05 (55-55.5)	20:1	51.7	<	<	<	<

Notes:

1 - Indicates the residual Co content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C3 - Summary of the mass of Copper leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	4.5	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	4.5	0.05	0.39	1.1%	8.0%
ANDW-07-01 (200-200.5)	3:1	4.5	0.009	0.009	0.2%	0.2%
ANDW-07-01 (255-255.5)	20:1	1.9	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	7.9	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	26.4	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	26.4	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	9.1	0.02	0.02	0.2%	0.2%
ANDW-07-02 (51-51.5)	20:1	1.9	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	1.9	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	3.3	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	16.4	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	18.9	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	18.9	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	31.7	0.02	2.36	0.1%	6.9%
MZ-07-01 (20-20.5)	20:1	49.5	0.00	0.87	0.0%	1.7%
MZ-07-01 (50-50.5)	20:1	3.6	<	<	<	<
MZ-07-01 (94-94.5)	20:1	2.6	<	<	<	<
MZ-07-01 (94-94.5)	3:1	2.6	0.06	0.06	2.3%	2.3%
MZ-07-01 (105-105.5)	20:1	4.9	<	<	<	<
MZ-07-03 (55-55.5)	20:1	239	0.06	0.24	0.0%	0.1%
MZ-07-03 (100-100.5)	20:1	28.1	0.00	0.17	0.0%	0.6%
MZ-07-03 (170-170.5)	20:1	12.5	0.00	0.17	0.0%	1.3%
MZ-07-03 (170-170.5)	3:1	12.5	0.09	0.09	0.7%	0.7%
MZ-07-03 (195-195.5)	20:1	9.7	<	<	<	<
MZ-07-04 (20-20.5)	20:1	3.2	0.03	3.98	0.5%	55.4%
MZ-07-04 (20-20.5)	3:1	3.2	0.015	0.015	0.5%	0.5%
MZ-07-04 (30-30.5)	20:1	16.6	0.00	0.32	0.0%	1.9%
MZ-07-04 (40-40.5)	20:1	10.3	0.03	0.03	0.3%	0.3%
MZ-07-05 (31-31.5)	20:1	4.8	<	<	<	<
MZ-07-05 (31-31.5)	3:1	4.8	0.045	0.045	0.9%	0.9%
MZ-07-05 (38-38.5)	20:1	3.4	0.03	0.03	1.0%	1.0%
MZ-07-05 (55-55.5)	20:1	96.9	<	<	<	<

Notes:

1 - Indicates the residual Cu content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C4 - Summary of the mass of Manganese leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	157	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	64	0.18	0.35	0.3%	0.5%
ANDW-07-01 (200-200.5)	3:1	64	0.087	0.087	0.1%	0.1%
ANDW-07-01 (255-255.5)	20:1	50	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	70	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	211	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	211	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	66	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	17	0.00	0.48	0.0%	2.7%
ANDW-07-02 (51-51.5)	3:1	17	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	200	0.00	0.34	0.0%	0.2%
ENDG-07-01 (20-20.5)	20:1	31	0.06	0.40	0.2%	1.3%
ENDG-07-01 (215-215.5)	20:1	402	0.09	1.56	0.0%	0.4%
ENDG-07-01 (215-215.5)	3:1	402	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	217	0.00	0.33	0.0%	0.2%
MZ-07-01 (20-20.5)	20:1	141	0.04	1.78	0.0%	1.2%
MZ-07-01 (50-50.5)	20:1	84	0.07	2.05	0.1%	2.4%
MZ-07-01 (94-94.5)	20:1	69	0.04	0.54	0.1%	0.8%
MZ-07-01 (94-94.5)	3:1	69	0.03	0.03	0.0%	0.0%
MZ-07-01 (105-105.5)	20:1	325	0.00	0.49	0.0%	0.2%
MZ-07-03 (55-55.5)	20:1	174	0.08	1.41	0.0%	0.8%
MZ-07-03 (100-100.5)	20:1	316	0.24	3.32	0.1%	1.0%
MZ-07-03 (170-170.5)	20:1	342	0.09	4.89	0.0%	1.4%
MZ-07-03 (170-170.5)	3:1	342	0.21	0.21	0.1%	0.1%
MZ-07-03 (195-195.5)	20:1	103	0.17	1.77	0.2%	1.7%
MZ-07-04 (20-20.5)	20:1	94	0.07	1.65	0.1%	1.7%
MZ-07-04 (20-20.5)	3:1	94	0.019	0.019	0.0%	0.0%
MZ-07-04 (30-30.5)	20:1	65	0.13	1.41	0.2%	2.1%
MZ-07-04 (40-40.5)	20:1	296	0.04	0.91	0.0%	0.3%
MZ-07-05 (31-31.5)	20:1	289	0.00	1.42	0.0%	0.5%
MZ-07-05 (31-31.5)	3:1	289	0.045	0.045	0.0%	0.0%
MZ-07-05 (38-38.5)	20:1	117	<	<	<	<
MZ-07-05 (55-55.5)	20:1	285	<	<	<	<

Notes:

1 - Indicates the residual Mn content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C5 - Summary of the mass of Molybdenum leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	0.9	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	0.9	<	<	<	<
ANDW-07-01 (200-200.5)	3:1	0.9	0.006	0.006	0.6%	0.6%
ANDW-07-01 (255-255.5)	20:1	0.4	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	0.8	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	0.9	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	0.9	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	0.8	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	0.3	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	0.3	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	0.5	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	0.4	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	0.3	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	0.3	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	2.8	<	<	<	<
MZ-07-01 (20-20.5)	20:1	3.4	0.06	0.06	1.7%	1.7%
MZ-07-01 (50-50.5)	20:1	1.8	0.04	0.04	2.1%	2.1%
MZ-07-01 (94-94.5)	20:1	1.0	0.08	0.08	7.8%	7.8%
MZ-07-01 (94-94.5)	3:1	1.0	0.09	0.09	8.7%	8.7%
MZ-07-01 (105-105.5)	20:1	1.8	0.02	0.02	1.1%	1.1%
MZ-07-03 (55-55.5)	20:1	56.7	0.04	0.04	0.1%	0.1%
MZ-07-03 (100-100.5)	20:1	33.3	0.10	0.10	0.3%	0.3%
MZ-07-03 (170-170.5)	20:1	8.3	0.21	0.21	2.5%	2.5%
MZ-07-03 (170-170.5)	3:1	8.3	0.24	0.24	2.8%	2.8%
MZ-07-03 (195-195.5)	20:1	5.7	0.19	0.19	3.3%	3.3%
MZ-07-04 (20-20.5)	20:1	1.0	<	<	<	<
MZ-07-04 (20-20.5)	3:1	1.0	0.89	0.89	46.1%	46.1%
MZ-07-04 (30-30.5)	20:1	1.3	0.10	0.10	7.4%	7.4%
MZ-07-04 (40-40.5)	20:1	1.8	0.31	0.31	14.7%	14.7%
MZ-07-05 (31-31.5)	20:1	2.4	0.08	0.08	3.2%	3.2%
MZ-07-05 (31-31.5)	3:1	2.4	0.07	0.07	3.0%	3.0%
MZ-07-05 (38-38.5)	20:1	1.6	<	<	<	<
MZ-07-05 (55-55.5)	20:1	5.9	0.24	0.24	3.8%	3.8%

Notes:

1 - Indicates the residual Mo content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C6 - Summary of the mass of Nickel leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	66.9	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	36.2	0.06	0.06	0.2%	0.2%
ANDW-07-01 (200-200.5)	3:1	36.2	0.05	0.05	0.1%	0.1%
ANDW-07-01 (255-255.5)	20:1	49.5	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	29.2	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	347	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	347	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	17.7	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	34.4	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	34.4	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	52.4	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	7.4	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	25.2	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	25.2	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	26.4	<	<	<	<
MZ-07-01 (20-20.5)	20:1	18.1	<	<	<	<
MZ-07-01 (50-50.5)	20:1	36	<	<	<	<
MZ-07-01 (94-94.5)	20:1	25.2	<	<	<	<
MZ-07-01 (94-94.5)	3:1	25.2	<	<	<	<
MZ-07-01 (105-105.5)	20:1	33.7	<	<	<	<
MZ-07-03 (55-55.5)	20:1	107	<	<	<	<
MZ-07-03 (100-100.5)	20:1	24.1	<	<	<	<
MZ-07-03 (170-170.5)	20:1	90.3	<	<	<	<
MZ-07-03 (170-170.5)	3:1	90.3	<	<	<	<
MZ-07-03 (195-195.5)	20:1	41.1	<	<	<	<
MZ-07-04 (20-20.5)	20:1	21.8	<	<	<	<
MZ-07-04 (20-20.5)	3:1	21.8	<	<	<	<
MZ-07-04 (30-30.5)	20:1	26.3	<	<	<	<
MZ-07-04 (40-40.5)	20:1	34.4	<	<	<	<
MZ-07-05 (31-31.5)	20:1	50.4	<	<	<	<
MZ-07-05 (31-31.5)	3:1	50.4	0.006	0.006	0.0%	0.0%
MZ-07-05 (38-38.5)	20:1	20.9	<	<	<	<
MZ-07-05 (55-55.5)	20:1	43.4	<	<	<	<

Notes:

1 - Indicates the residual Ni content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C7 - Summary of the mass of Lead leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	23.6	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	49.7	0.04	0.85	0.1%	1.7%
ANDW-07-01 (200-200.5)	3:1	49.7	0.006	0.006	0.0%	0.0%
ANDW-07-01 (255-255.5)	20:1	11	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	7.1	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	6.7	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	6.7	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	5.2	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	14.3	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	14.3	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	7.4	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	7.7	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	5.9	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	5.9	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	9.1	<	<	<	<
MZ-07-01 (20-20.5)	20:1	4.2	0.06	0.06	1.4%	1.4%
MZ-07-01 (50-50.5)	20:1	27.1	0.04	0.04	0.1%	0.1%
MZ-07-01 (94-94.5)	20:1	27.3	0.08	0.08	0.3%	0.3%
MZ-07-01 (94-94.5)	3:1	27.3	<	<	<	<
MZ-07-01 (105-105.5)	20:1	42.2	0.02	0.02	0.0%	0.0%
MZ-07-03 (55-55.5)	20:1	18.6	0.04	0.04	0.2%	0.2%
MZ-07-03 (100-100.5)	20:1	11.1	0.10	0.10	0.9%	0.9%
MZ-07-03 (170-170.5)	20:1	9.1	0.21	0.21	2.3%	2.3%
MZ-07-03 (170-170.5)	3:1	9.1	0.03	0.03	0.3%	0.3%
MZ-07-03 (195-195.5)	20:1	36.7	0.19	0.19	0.5%	0.5%
MZ-07-04 (20-20.5)	20:1	26.7	0.00	0.00	0.0%	0.0%
MZ-07-04 (20-20.5)	3:1	26.7	<	<	<	<
MZ-07-04 (30-30.5)	20:1	39.9	0.10	0.10	0.2%	0.2%
MZ-07-04 (40-40.5)	20:1	16.6	0.31	0.31	1.9%	1.9%
MZ-07-05 (31-31.5)	20:1	113.5	0.08	0.08	0.1%	0.1%
MZ-07-05 (31-31.5)	3:1	113.5	0.10	0.10	0.1%	0.1%
MZ-07-05 (38-38.5)	20:1	14.7	0.00	0.00	0.0%	0.0%
MZ-07-05 (55-55.5)	20:1	18.7	0.24	0.24	1.2%	1.2%

Notes:

1 - Indicates the residual Pb content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C8 - Summary of the mass of Antimony leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	0.07	0.18	1.76	9.8%	96.2%
ANDW-07-01 (200-200.5)	20:1	0.14	0.17	1.78	9.1%	92.7%
ANDW-07-01 (200-200.5)	3:1	0.14	<	<	<	<
ANDW-07-01 (255-255.5)	20:1	0.05	0.18	1.73	10.1%	97.2%
ANDW-07-01 (50-50.5)	20:1	0.14	0.18	1.59	10.4%	91.9%
ANDW-07-01 (80-80.5)	20:1	0.20	0.18	1.63	9.8%	89.1%
ANDW-07-01 (80-80.5)	3:1	0.20	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	0.18	0.19	1.88	9.0%	91.3%
ANDW-07-02 (51-51.5)	20:1	0.08	0.17	1.76	9.5%	95.6%
ANDW-07-02 (51-51.5)	3:1	0.08	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	0.05	0.18	1.86	9.6%	97.4%
ENDG-07-01 (20-20.5)	20:1	0.11	0.18	1.88	9.2%	94.5%
ENDG-07-01 (215-215.5)	20:1	0.05	0.19	1.82	9.9%	97.3%
ENDG-07-01 (215-215.5)	3:1	0.05	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	0.05	0.19	1.85	9.8%	97.4%
MZ-07-01 (20-20.5)	20:1	0.07	0.19	1.93	9.3%	96.5%
MZ-07-01 (50-50.5)	20:1	<0.05	0.19	1.83	-	-
MZ-07-01 (94-94.5)	20:1	0.08	0.18	1.84	9.5%	95.8%
MZ-07-01 (94-94.5)	3:1	0.08	<	<	<	<
MZ-07-01 (105-105.5)	20:1	0.06	0.18	1.81	9.8%	96.8%
MZ-07-03 (55-55.5)	20:1	0.13	0.19	1.82	9.7%	93.3%
MZ-07-03 (100-100.5)	20:1	0.05	0.19	1.89	9.6%	97.4%
MZ-07-03 (170-170.5)	20:1	0.07	0.19	1.84	9.8%	96.3%
MZ-07-03 (170-170.5)	3:1	0.07				
MZ-07-03 (195-195.5)	20:1	0.11	0.18	1.79	9.6%	94.2%
MZ-07-04 (20-20.5)	20:1	0.06	0.18	1.76	10.0%	96.7%
MZ-07-04 (20-20.5)	3:1	0.06	<	<	<	<
MZ-07-04 (30-30.5)	20:1	0.05	0.19	1.80	10.1%	97.3%
MZ-07-04 (40-40.5)	20:1	0.09	0.19	1.92	9.2%	95.5%
MZ-07-05 (31-31.5)	20:1	0.06	0.18	1.77	10.0%	96.7%
MZ-07-05 (31-31.5)	3:1	0.06	<	<	<	<
MZ-07-05 (38-38.5)	20:1	<0.05	0.18	1.91	-	-
MZ-07-05 (55-55.5)	20:1	0.06	0.18	1.57	10.8%	96.3%

Notes:

1 - Indicates the residual Sb content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C9 - Summary of the mass of Selenium leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	<1.0	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	<1.0	<	<	<	<
ANDW-07-01 (200-200.5)	3:1	<1.0	<	<	<	<
ANDW-07-01 (255-255.5)	20:1	<1.0	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	<1.0	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	1.0	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	1.0	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	<1.0	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	1.0	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	1.0	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	<1.0	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	1.0	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	<1.0	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	<1.0	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	1.0	0.18	0.18	15.3%	15.3%
MZ-07-01 (20-20.5)	20:1	<1.0	<	<	<	<
MZ-07-01 (50-50.5)	20:1	<1.0	<	<	<	<
MZ-07-01 (94-94.5)	20:1	<1.0	<	<	<	<
MZ-07-01 (94-94.5)	3:1	<1.0	<	<	<	<
MZ-07-01 (105-105.5)	20:1	1.0	<	<	<	<
MZ-07-03 (55-55.5)	20:1	1.0	<	<	<	<
MZ-07-03 (100-100.5)	20:1	<1.0	<	<	<	<
MZ-07-03 (170-170.5)	20:1	1.0	<	<	<	<
MZ-07-03 (170-170.5)	3:1	1.0	<	<	<	<
MZ-07-03 (195-195.5)	20:1	1.0	<	<	<	<
MZ-07-04 (20-20.5)	20:1	<1.0	<	<	<	<
MZ-07-04 (20-20.5)	3:1	<1.0	0.042	0.042	-	-
MZ-07-04 (30-30.5)	20:1	<1.0	<	<	<	<
MZ-07-04 (40-40.5)	20:1	<1.0	<	<	<	<
MZ-07-05 (31-31.5)	20:1	2.0	<	<	<	<
MZ-07-05 (31-31.5)	3:1	2.0	0.024	0.024	1.2%	1.2%
MZ-07-05 (38-38.5)	20:1	<1.0	<	<	<	<
MZ-07-05 (55-55.5)	20:1	1.0	<	<	<	<

Notes:

1 - Indicates the residual Se content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C10 - Summary of the mass of Strontium leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	19	0.73	3.25	3.3%	14.6%
ANDW-07-01 (200-200.5)	20:1	45.7	8.64	10.26	15.4%	18.3%
ANDW-07-01 (200-200.5)	3:1	45.7	9.12	9.12	16.6%	16.6%
ANDW-07-01 (255-255.5)	20:1	18	6.26	8.28	23.8%	31.5%
ANDW-07-01 (50-50.5)	20:1	31.8	0.00	1.15	0.0%	3.5%
ANDW-07-01 (80-80.5)	20:1	67.1	0.04	1.34	0.1%	2.0%
ANDW-07-01 (80-80.5)	3:1	67.1	0.03	0.03	0.0%	0.0%
ANDW-07-02 (26-26.5)	20:1	109	0.04	0.88	0.0%	0.8%
ANDW-07-02 (51-51.5)	20:1	388	0.00	0.80	0.0%	0.2%
ANDW-07-02 (51-51.5)	3:1	388	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	9.8	0.21	2.56	1.7%	20.7%
ENDG-07-01 (20-20.5)	20:1	149	0.11	0.80	0.1%	0.5%
ENDG-07-01 (215-215.5)	20:1	121	0.77	2.08	0.6%	1.7%
ENDG-07-01 (215-215.5)	3:1	121	0.48	0.48	0.4%	0.4%
ENDG-07-01 (50-50.5)	20:1	67.2	0.04	0.88	0.1%	1.3%
MZ-07-01 (20-20.5)	20:1	43.2	0.13	1.71	0.3%	3.8%
MZ-07-01 (50-50.5)	20:1	24.4	0.21	2.69	0.8%	9.9%
MZ-07-01 (94-94.5)	20:1	23	0.43	3.75	1.6%	14.0%
MZ-07-01 (94-94.5)	3:1	23	0.36	0.36	1.5%	1.5%
MZ-07-01 (105-105.5)	20:1	22.1	0.15	2.45	0.6%	10.0%
MZ-07-03 (55-55.5)	20:1	238	0.31	0.81	0.1%	0.3%
MZ-07-03 (100-100.5)	20:1	229	0.17	0.68	0.1%	0.3%
MZ-07-03 (170-170.5)	20:1	73.2	0.17	3.65	0.2%	4.8%
MZ-07-03 (170-170.5)	3:1	73.2	0.21	0.21	0.3%	0.3%
MZ-07-03 (195-195.5)	20:1	18.8	0.45	2.03	2.1%	9.8%
MZ-07-04 (20-20.5)	20:1	152	0.15	1.88	0.1%	1.2%
MZ-07-04 (20-20.5)	3:1	152	0.10	0.10	0.1%	0.1%
MZ-07-04 (30-30.5)	20:1	22.9	0.33	2.09	1.3%	8.3%
MZ-07-04 (40-40.5)	20:1	116	0.10	1.66	0.1%	1.4%
MZ-07-05 (31-31.5)	20:1	36.1	0.41	1.20	1.1%	3.2%
MZ-07-05 (31-31.5)	3:1	36.1	0.10	0.10	0.3%	0.3%
MZ-07-05 (38-38.5)	20:1	8	0.00	0.52	0.0%	6.1%
MZ-07-05 (55-55.5)	20:1	74	0.40	2.10	0.5%	2.8%

Notes:

1 - Indicates the residual Sr content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C11 - Summary of the mass of Uranium leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	268	0.96	7.57	0.3%	2.7%
ANDW-07-01 (200-200.5)	20:1	253	0.31	1.31	0.1%	0.5%
ANDW-07-01 (200-200.5)	3:1	253	0.19	0.19	0.1%	0.1%
ANDW-07-01 (255-255.5)	20:1	33.4	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	3.9	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	8.5	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	8.5	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	7.2	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	43.9	0.00	1.30	0.0%	2.9%
ANDW-07-02 (51-51.5)	3:1	43.9	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	28.5	0.20	1.88	0.7%	6.2%
ENDG-07-01 (20-20.5)	20:1	3.4	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	2.9	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	2.9	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	4.3	<	<	<	<
MZ-07-01 (20-20.5)	20:1	3.5	<	<	<	<
MZ-07-01 (50-50.5)	20:1	97.2	0.70	2.53	0.7%	2.5%
MZ-07-01 (94-94.5)	20:1	137	1.50	7.48	1.0%	5.2%
MZ-07-01 (94-94.5)	3:1	137	1.26	1.26	0.9%	0.9%
MZ-07-01 (105-105.5)	20:1	264	2.05	11.25	0.7%	4.1%
MZ-07-03 (55-55.5)	20:1	6.5	<	<	<	<
MZ-07-03 (100-100.5)	20:1	7.0	<	<	<	<
MZ-07-03 (170-170.5)	20:1	24.8	<	<	<	<
MZ-07-03 (170-170.5)	3:1	24.8	<	<	<	<
MZ-07-03 (195-195.5)	20:1	550	8.16	25.40	1.4%	4.4%
MZ-07-04 (20-20.5)	20:1	80.6	0.53	4.01	0.6%	4.7%
MZ-07-04 (20-20.5)	3:1	80.6	0.12	0.12	0.1%	0.1%
MZ-07-04 (30-30.5)	20:1	215	1.34	8.50	0.6%	3.8%
MZ-07-04 (40-40.5)	20:1	32.0	<	<	<	<
MZ-07-05 (31-31.5)	20:1	294	1.34	7.77	0.4%	2.6%
MZ-07-05 (31-31.5)	3:1	294	2.17	2.71	0.7%	0.9%
MZ-07-05 (38-38.5)	20:1	10.9	<	<	<	<
MZ-07-05 (55-55.5)	20:1	165	1.10	2.30	0.7%	1.4%

Notes:

1 - Indicates the residual U content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C12 - Summary of the mass of Vanadium leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	121	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	326	<	<	<	<
ANDW-07-01 (200-200.5)	3:1	326	<	<	<	<
ANDW-07-01 (255-255.5)	20:1	340	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	87	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	79	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	79	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	60	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	27	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	27	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	86	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	11	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	59	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	59	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	78	<	<	<	<
MZ-07-01 (20-20.5)	20:1	60	<	<	<	<
MZ-07-01 (50-50.5)	20:1	324	0.10	0.10	0.0%	0.0%
MZ-07-01 (94-94.5)	20:1	215	<	<	<	<
MZ-07-01 (94-94.5)	3:1	215	0.03	0.03	0.0%	0.0%
MZ-07-01 (105-105.5)	20:1	222	0.10	0.10	0.0%	0.0%
MZ-07-03 (55-55.5)	20:1	39	<	<	<	<
MZ-07-03 (100-100.5)	20:1	65	<	<	<	<
MZ-07-03 (170-170.5)	20:1	56	0.08	0.08	0.1%	0.1%
MZ-07-03 (170-170.5)	3:1	56	0.06	0.06	0.1%	0.1%
MZ-07-03 (195-195.5)	20:1	199	0.07	0.38	0.0%	0.2%
MZ-07-04 (20-20.5)	20:1	109	<	<	<	<
MZ-07-04 (20-20.5)	3:1	109	0.01	0.01	0.0%	0.0%
MZ-07-04 (30-30.5)	20:1	199	0.10	0.10	0.0%	0.0%
MZ-07-04 (40-40.5)	20:1	74	<	<	<	<
MZ-07-05 (31-31.5)	20:1	359	0.14	0.14	0.0%	0.0%
MZ-07-05 (31-31.5)	3:1	359	0.09	0.09	0.0%	0.0%
MZ-07-05 (38-38.5)	20:1	47	<	<	<	<
MZ-07-05 (55-55.5)	20:1	63	0.06	0.06	0.1%	0.1%

Notes:

1 - Indicates the residual V content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C13 - Summary of the mass of Zinc leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	24	0.06	0.06	0.2%	0.2%
ANDW-07-01 (200-200.5)	20:1	16	0.79	1.79	4.4%	10.1%
ANDW-07-01 (200-200.5)	3:1	16	<	<	<	<
ANDW-07-01 (255-255.5)	20:1	16	0.13	0.13	0.8%	0.8%
ANDW-07-01 (50-50.5)	20:1	9	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	130	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	130	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	12	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	9	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	9	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	40	0.12	0.12	0.3%	0.3%
ENDG-07-01 (20-20.5)	20:1	6	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	58	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	58	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	39	<	<	<	<
MZ-07-01 (20-20.5)	20:1	19	<	<	<	<
MZ-07-01 (50-50.5)	20:1	8	<	<	<	<
MZ-07-01 (94-94.5)	20:1	17	<	<	<	<
MZ-07-01 (94-94.5)	3:1	17	0.09	0.09	0.5%	0.5%
MZ-07-01 (105-105.5)	20:1	53	<	<	<	<
MZ-07-03 (55-55.5)	20:1	40	<	<	<	<
MZ-07-03 (100-100.5)	20:1	47	<	<	<	<
MZ-07-03 (170-170.5)	20:1	67	0.08	0.08	0.1%	0.1%
MZ-07-03 (170-170.5)	3:1	67	0.09	0.09	0.1%	0.1%
MZ-07-03 (195-195.5)	20:1	17	<	<	<	<
MZ-07-04 (20-20.5)	20:1	24	<	<	<	<
MZ-07-04 (20-20.5)	3:1	24	<	<	<	<
MZ-07-04 (30-30.5)	20:1	17	<	<	<	<
MZ-07-04 (40-40.5)	20:1	59	<	<	<	<
MZ-07-05 (31-31.5)	20:1	8	<	<	<	<
MZ-07-05 (31-31.5)	3:1	8	0.08	0.08	1.0%	1.0%
MZ-07-05 (38-38.5)	20:1	27	<	<	<	<
MZ-07-05 (55-55.5)	20:1	63	<	<	<	<

Notes:

1 - Indicates the residual Zn content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

Table C14 - Summary of the mass of Sulphate leached from Kiggavik rock samples drilled in 2007 and 2009.

Sample ID	Water:Solids Ratio	Residual Solids Content[1]	Water Leachable[2]	Total Leachable[2]	Water Leachable	Total Leachable
		(mg/kg)	(mg/kg)	(mg/kg)	(% of Total)	(% of Total)
ANDW-07-01 (185-185.5)	20:1	<300	<	<	<	<
ANDW-07-01 (200-200.5)	20:1	<300	<	<	<	<
ANDW-07-01 (200-200.5)	3:1	<300	18	18	5.7%	5.7%
ANDW-07-01 (255-255.5)	20:1	<300	<	<	<	<
ANDW-07-01 (50-50.5)	20:1	<300	<	<	<	<
ANDW-07-01 (80-80.5)	20:1	300	<	<	<	<
ANDW-07-01 (80-80.5)	3:1	300	<	<	<	<
ANDW-07-02 (26-26.5)	20:1	<300	<	<	<	<
ANDW-07-02 (51-51.5)	20:1	300	<	<	<	<
ANDW-07-02 (51-51.5)	3:1	300	<	<	<	<
ENDG-07-01 (140-140.5)	20:1	1200	<	<	<	<
ENDG-07-01 (20-20.5)	20:1	300	<	<	<	<
ENDG-07-01 (215-215.5)	20:1	300	<	<	<	<
ENDG-07-01 (215-215.5)	3:1	300	<	<	<	<
ENDG-07-01 (50-50.5)	20:1	5400	<	<	<	<
MZ-07-01 (20-20.5)	20:1	19500	<	<	<	<
MZ-07-01 (50-50.5)	20:1	<300	<	<	<	<
MZ-07-01 (94-94.5)	20:1	1200	<	<	<	<
MZ-07-01 (94-94.5)	3:1	1200	<	<	<	<
MZ-07-01 (105-105.5)	20:1	<300	<	<	<	<
MZ-07-03 (55-55.5)	20:1	41100	<	<	<	<
MZ-07-03 (100-100.5)	20:1	7800	<	<	<	<
MZ-07-03 (170-170.5)	20:1	300	<	<	<	<
MZ-07-03 (170-170.5)	3:1	300	<	<	<	<
MZ-07-03 (195-195.5)	20:1	3300	120	120	3.5%	3.5%
MZ-07-04 (20-20.5)	20:1	600	<	<	<	<
MZ-07-04 (20-20.5)	3:1	600	23	23	3.7%	3.7%
MZ-07-04 (30-30.5)	20:1	1500	60	60	3.8%	3.8%
MZ-07-04 (40-40.5)	20:1	600	<	<	<	<
MZ-07-05 (31-31.5)	20:1	<300	<	<	<	<
MZ-07-05 (31-31.5)	3:1	<300	<	<	<	<
MZ-07-05 (38-38.5)	20:1	<300	<	<	<	<
MZ-07-05 (55-55.5)	20:1	8400	<	<	<	<

Notes:

1 - Indicates the residual SO_4 content of the sample after leaching based on analysis of remnant solids for 20:1 leaches and difference between original and amount leached for 3:1 leaches.

2 - Values with "less than" symbols (<) indicate that concentrations in the leachate were below detection limits. All values less than detection limits were assigned a value of zero. Refer to Appendix B for leachate chemistry results.

ATTACHMENT D – HUMIDTY CELL TESTS COPC PLOTS

Table D1 – Type I Andrew Lake and Main Zone waste rock humidity cell COPC plots.

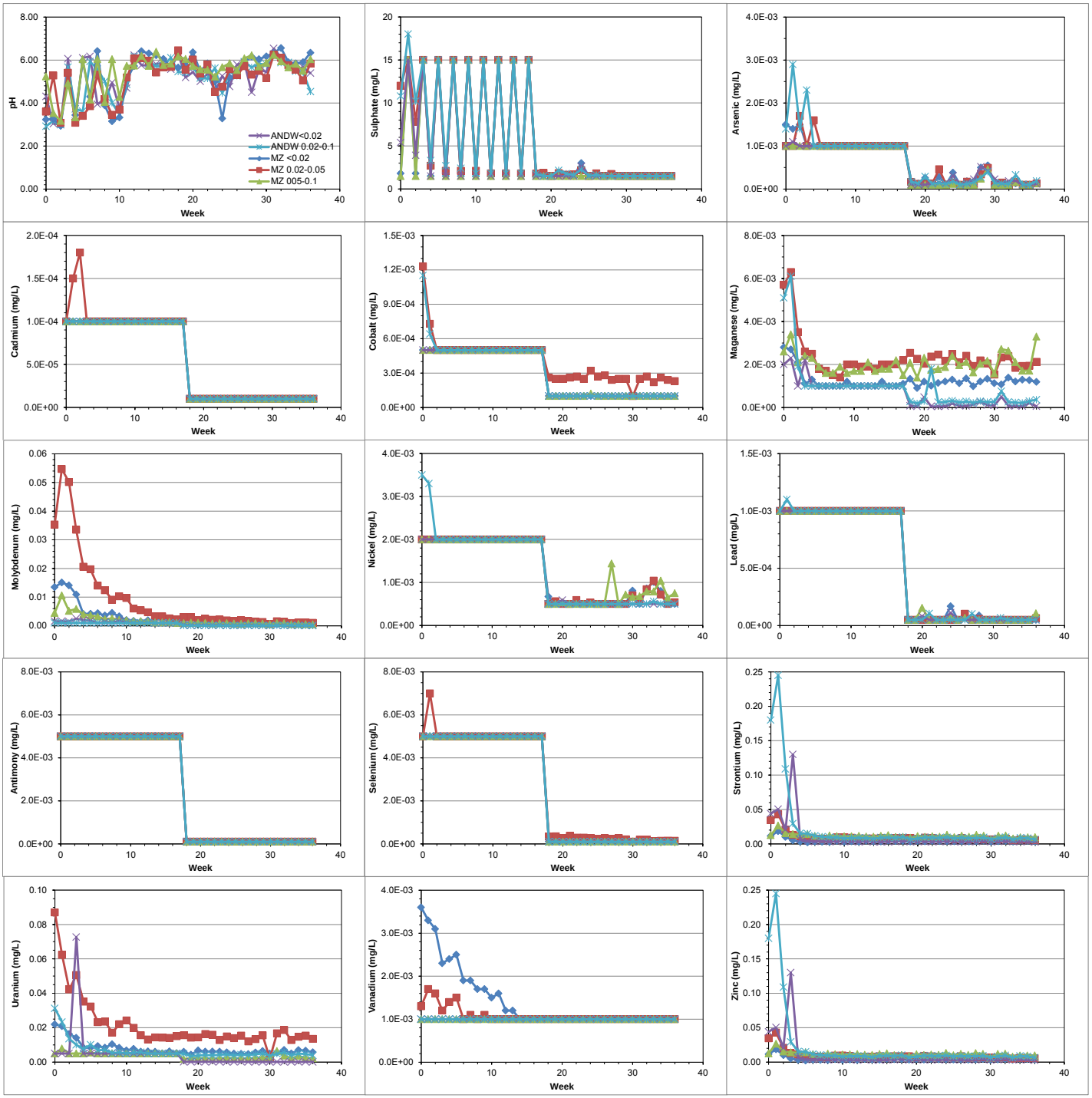
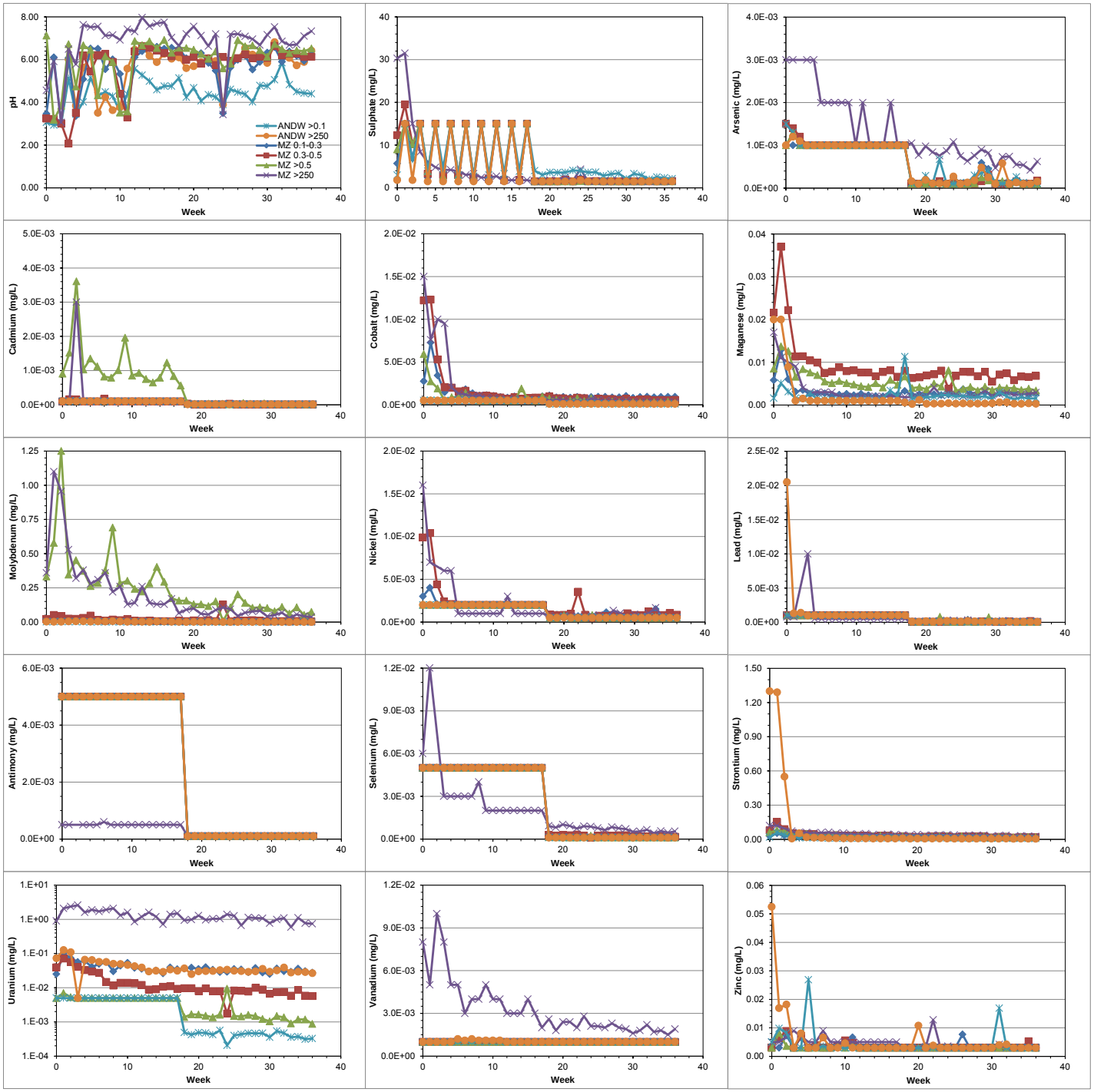
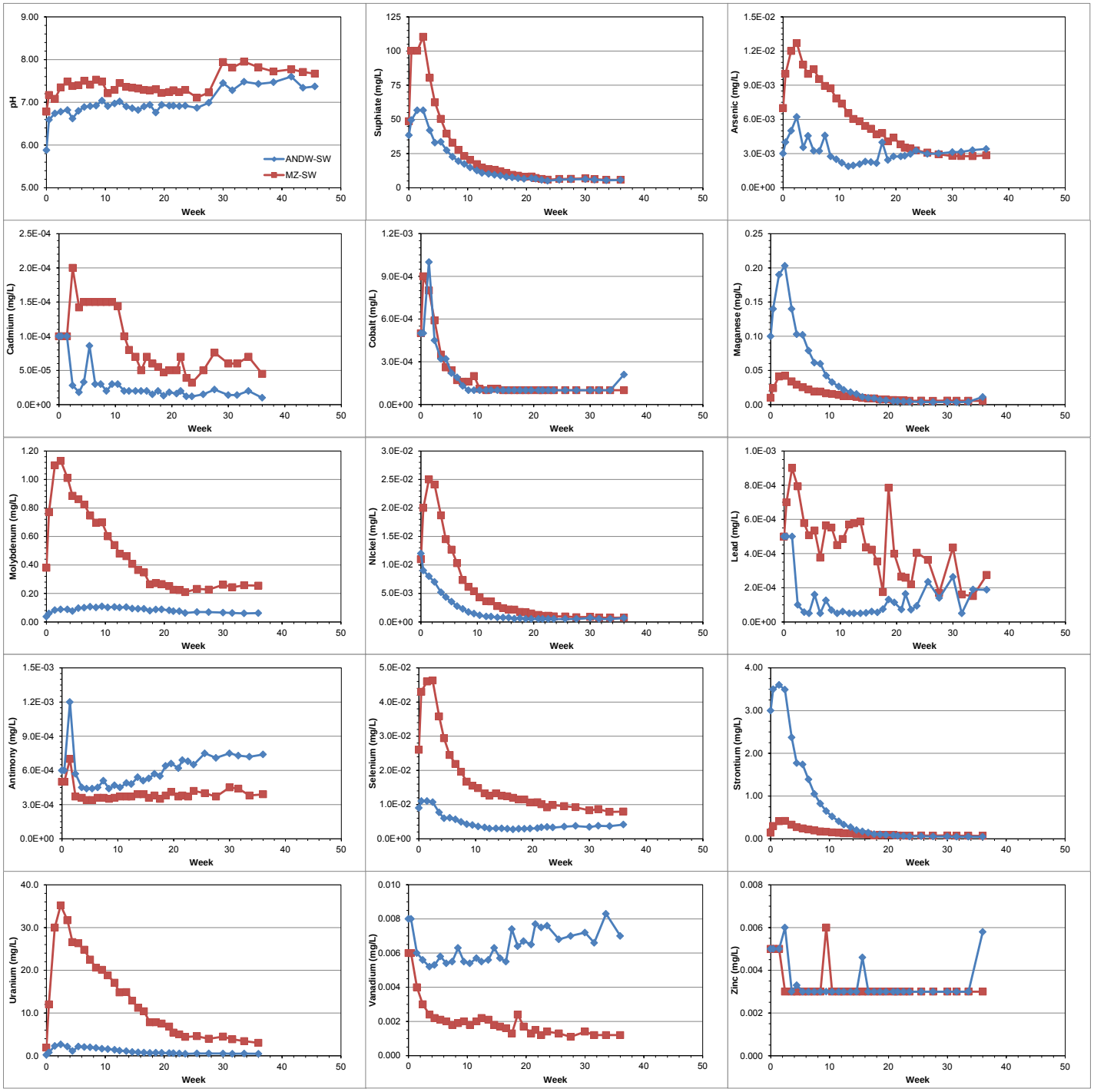


Table D2 – Type III Andrew Lake and Main Zone waste rock humidity cell COPC plots.



ATTACHMENT E – SUBMERGED WASTE ROCK COLUMN DATA

Table E1 –Andrew Lake and Main Zone waste rock submerged column COPC plots.



ATTACHMENT F – ASSESSMENT OF WATER QUALITY EFFECTS OF IN PIT STORAGE OF TAILINGS AND MINE ROCK AT THE PROPOSED KIGGAVIK URANIUM MINE

Assessment of Water Quality Effects of In-Pit Storage of Tailings and Mine Rock at the Proposed Kiggavik Uranium Mine

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Reference : 13-2067
September 2014

Assessment of Water Quality Effects of In-Pit Storage of Tailings and Mine Rock at the Proposed Kiggavik Uranium Mine

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EXECUTIVE SUMMARY

AREVA Resources Canada Inc. has completed an Environmental Assessment (EA) of the Kiggavik Uranium Project in Nunavut. As part of the EA, EcoMetrix Incorporated was retained by AREVA to complete a geochemical assessment of potential mine rock and tailings materials including an evaluation of water quality effects associated with the proposed in-pit tailings management facility (TMF) that will also contain Type 3 mine rock. The expected surface water quality effects of the in-pit storage of tailings and mine rock were assessed.

Permanent storage of tailings and Type 3 (potentially reactive) mine rock in the East and Centre Zone pits is planned in order to isolate those materials from humans and the environment. The conceptual model for the TMF includes tailings at the bottom of the open pit that are overlain by rock with very little to no flow through the tailings or rock because of the low permeability of the surrounding rock. The pore waters within the tailings and rock will have elevated concentrations of some constituents of potential concern (COPC). Within this “bathtub” model, the transport of COPCs will be controlled by molecular diffusion from the zones of elevated concentrations within the pore water upward toward the low concentrations in water near the ground surface that originates from rain and snowmelt,. The diffusive flux contributions of some COPCs will be dominated by transport from tailings while others will be dominated by those from submerged Type 3 mine rock, depending upon their respective pore water concentrations.

This assessment has shown that, except for uranium, all COPCs are expected to remain below levels that are protective of local water quality and the environment, including humans. A conservative assessment demonstrated that the Type 3 mine rock with elevated uranium contents may result in elevated uranium concentrations above CCME and Heath Canada guidelines in the shallow pit water if no mitigation is applied to the Type 3 mine rock. Assuming the most conservative upper-bound uranium concentration in the pore water within Type 3 rock resulted in a predicted uranium concentration in surface water of 0.1 mg/L or approximately 7 times greater than the most sensitive water quality criterion of 0.015 mg/L.

Uranium leaching is directly correlated with bulk uranium content of the mine rock and the estimated chemical make-up of the proposed Type 3 mine rock stockpiles was not certain at the time of report writing. However; if the uranium content of the Type 3 mine rock stockpile materials differs substantially from that in the materials used in humidity cell and submerged column tests considered in this assessment, then predicted water concentrations will be re-evaluated. If the bulk uranium contents of Type 3 rock used in the analytical testing are representative, then additional mitigation may be required to meet uranium water quality criteria in surface water at the Kiggavik site.

Mitigation measures such as treatment of the rock before or during relocation or covering the rock with organic material in the pit are expected to be effective for reducing uranium concentrations in the surface water to levels that would meet water quality standards.

Uranium concentrations can be controlled using pH adjustment with lime or the addition of ferric sulphate. These reagents can be added to the mine rock in liquid form in order to get good mixing prior to placement of the rock in the pit. Dosing of these reagents would be based on test results that determined the soluble masses of uranium requiring treatment. Efficient removal of uranium from the pore water may require a combination of lime and ferric sulphate addition.

Chemical attenuation represents an alternative mitigation strategy. At the closed Cluff Lake uranium mine in northern Saskatchewan, it has been demonstrated that uranium is permanently attenuated when water with elevated uranium concentrations migrates through organic lake sediments. The Type 3 rock can be covered by organic materials that will originate from areas prepared for pit excavation. This approach can effectively prevent uranium transport to the shallow water in the pit and therefore also prevent elevated uranium in the surface water outflow from the pit.

With mitigation measures it is predicted that the in-pit TMF uranium concentrations could be managed to meet water quality criteria in downstream surface water. If the updated mine rock characteristics show that mitigation of the relocated Type 3 rock is required, a test program will be designed and implemented to develop the appropriate design criteria for effective mitigation.

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1.0 Introduction

AREVA Resources Canada Inc. (AREVA) has completed an Environmental Assessment (EA) of the Kiggavik Uranium Project in Nunavut. As part of the EA, EcoMetrix Incorporated (EcoMetrix) was retained by AREVA to complete a geochemical assessment of potential mine rock and tailings materials in order to characterize the water quality effects associated with the proposed in-pit tailings management facility (TMF) that will also contain Type 3 mine rock.

1.1 Overview

Mining activities at the Kiggavik Uranium Project are expected to produce materials necessitating long-term storage and management. A preliminary assessment of these materials indicated that in-pit TMFs could provide safe long-term storage of mine materials (AREVA, 2011a). Materials requiring storage and management include tailings and mineralized (Type 3) mine rock. The characterization and test programs completed on the tailings and mine rock are described in detail in Appendices J (AREVA, 2011a) and F (AREVA, 2011b), respectively of the EIS. The descriptions of, and criteria for classification, of the three rock types are summarized in **Table 1-1**.

Placement of potentially reactive mine rock and tailings in mined out open pits or other mine openings is the preferred approach for safe long term storage at uranium mines in Canada (CNSC, 2012). The water quality effects of such storage, however, need to be demonstrated. The expected water quality effects of the in-pit storage of tailings and mine rock were therefore assessed and the results are presented in this report.

Table 1-1: Mine Rock Classification

Mine Rock Type	Criteria (uranium and sulphur contents)	Comments
1	Uranium less than 80 mg/kg Sulphur less than 0.1 %S	Will be suitable for construction.
2	Uranium less than 250 mg/kg and Sulphur less than 0.1 %S	Will be suitable for on-land storage with no water quality impairment. Not to be used for construction
3	Uranium greater than 250 mg/kg or Sulphur greater than 0.1 %S	Will require underwater storage over the long term to prevent risks to water quality impairment.

1.2 Conceptual Site Model

The proposed TMF configurations for the East and Centre Zone pits from AREVA (2011a) were used for the development of the conceptual site model as presented in **Figure 1-1 and 1-2**. The conceptual model was developed to assess water quality effects on the surface water environment resulting from the in-pit management of tailings and Type 3 mine rock. As shown in Figure 1-1, tailings will be deposited in mined out pits. The rock surrounding the pits has a very low hydraulic conductivity and will not readily transmit water and will practically behave as a bathtub. The hydraulic conductivity of the tailings will be relatively low and that of backfilled rock above the tailings will be higher. The active zone represents a layer, a few metres thick, at surface that will freeze and thaw annually and this zone

will have active horizontal flow on surface and/or in the shallow subsurface during the non-frozen season.

The tailings and backfilled mine rock will have elevated concentrations of some COPCs in the pore waters that fill the voids in these flooded materials. There will be very little to no flow through the tailings or rock in the pit because of the hydraulic characteristics of the surrounding rock. Therefore the transport of COPCs will be controlled by molecular diffusion from the zones of elevated concentrations in pore water of the tailings and rock upward toward the low concentrations in overlying water in the active zone that will originate from rain and snowmelt. Type 3 mine rock will be relocated to a layer above the tailings for permanent storage. The pits will either contain only tailings or will have tailings overlain by Type 3 rock. In either case, a final layer of clean Type 2 rock will be placed in the pit to surface. In the conceptual in-pit storage model it is assumed that a clean mine rock layer will be placed over the Type 3 mine rock or tailings as shown in Figures 1-2 and 1-3.. The layer of clean mine rock will have negligible concentrations of COPCs in the pore water in comparison to the pore water in tailings and Type 3 mine rock materials. A clean water layer within the upper zone or above the clean mine rock within the overlying till represents the location where constituents will be transported to by diffusion and where COPCs can potentially enter the active horizontal flow zone before entering the surface water environment as shown in **Figure 1-2** and **Figure 1-3**. The pore water in either the tailings or in the Type 3 mine rock under the clean Type 1 or 2 mine rock will represent the source concentrations of COPCs, that can be transported upward by diffusion through the pore water in the clean rock layer to the active subsurface flow regime near the water table. Diffusive transport occurs from zones of high concentration to zones of lower concentrations. The diffusive flux contributions of some COPCs can therefore be dominated by transport from tailings while others will be dominated by those from Type 3 mine rock, depending on the pore water concentrations present in the pore waters of either material.

Only the main zone TMF has been proposed as being a storage destination for the Type 3 mine rock. Other pits will store tailings overlain by clean Type 1 or 2 mine rock (AREVA 2011a). The use of Type 3 mine rock rather than Type 2 mine rock as the layer above the tailings materials would produce a more conservative estimate of overlying water concentrations. The Type 1 or 2 mine rock will have concentrations of constituents of potential concern (COPCs) that are much less than those in the Type 3 mine rock layer.

Estimates of the concentrations in the pore waters in the tailings and Type 3 rock were required to evaluate the diffusion of COPC through the clean Type 1 or Type 2 rock layer and the final concentrations in the shallow pit water. Estimates of the diffusion coefficients were also required. These estimates were developed with a combination of laboratory tests on tailings and Type 3 rock as well as calculated vales that were based on measured leaching rates from humidity cell tests on Type 3 rock.

Diffusion through the layers of rock were simulated using column tests that maintained a fixed height of water overtop a mass of tailings that was in-turn overlain by a layer of Type 1 mine rock. Pore water within both the tailings layer and the mine rock were measured at the start and end of the tests. In the layered column tests non-reactive constituents were used to estimate effective diffusion coefficients for constituent transport through the layer of Type 1 mine rock without any chemical attenuation.

The COPC concentrations in pore water within the Type 3 mine rock were estimated as the highest values associated with measured or calculated values. One test involved Type 3 mine rock materials submerged in a column that was closed to the atmosphere. Pore water concentrations were also estimated for weathered Type 3 rock using the results of humidity cell tests to predict leaching rates

and by assuming that the rock weathered on surface for 10 years prior to relocating the rock to the pit at closure. In that scenario it was assumed that the entire soluble mass accumulated during weathering of the temporary stockpile will dissolve and be released to the pore water when the temporary mine rock pile is relocated to the in-pit TMF and flooded. The different approaches to estimating COPC concentrations in pore water were used to assess the range of possible values in the Type 3 mine rock pore water and its effects on the surface water quality of the in-pit TMF.

The COPC concentrations in tailings pore water were determined from pore water concentrations measured in the layered tailings column test.

The fluxes (F) of COPCs from the pore water in tailings and Type 3 mine rock were then calculated as steady state values using Fick's First Law that is given as;

$$F = D_e (C_{pw} – C_{sw})/Z$$

in which D_e is the effective diffusion coefficient in the pore water, C_{pw} is the COPC concentration in the pore water of either the tailings or Type 3 mine rock, C_{sw} is the COPC concentration in the shallow water at the water table and Z is the thickness of the Type 1 or 2 mine rock overlying the tailings or Type 3 rock. As a conservative measure, the value of C_{sw} was assumed to be zero when calculating the upward flux of COPCs through the clean Type 1 or Type 2 rock layer.

The flux represents the mass (mg) of COPC that migrates up though the Type 1 or 2 mine rock across a horizontal area (square metres) per unit time (second). The total rate of mass transferred up to the top of the clean rock is therefore the flux multiplied by the total area of the top of the rock layer, given as mass (mg) per second. This mass is transported to the water flowing through the upper layer near ground surface that is a function of the rate of infiltration of rain and snowmelt. The mass that is transferred to the active flow zone will then mix with the shallow infiltrating water and therefore, the mass transfer rate can be divided by the infiltration rate to estimate the resulting concentration in the shallow water migrating horizontally through the pit.

Direct precipitation to the in-pit TMF was assumed to be the only source of water available to assimilate the flux of COPCs from the tailings and mine rock in the flooded pit. Additional water inflow sources such as local surface runoff would serve to further reduce predicted concentrations but were not considered in this assessment in order to remain conservative.

Support fillers, including sand and rock, proposed to be placed atop the tailings materials during filling of the in-pit TMFs were not included as a component of this model. Those layers were not considered here in order to remain conservative because detailed design of the layers that will be completed during licensing were not available at the time of this assessment. However, these sand and rock materials would serve to further retard diffusive transport of COPCs from the underlying tailings and would result in lower predicted concentrations in surface water, than those predicted here.

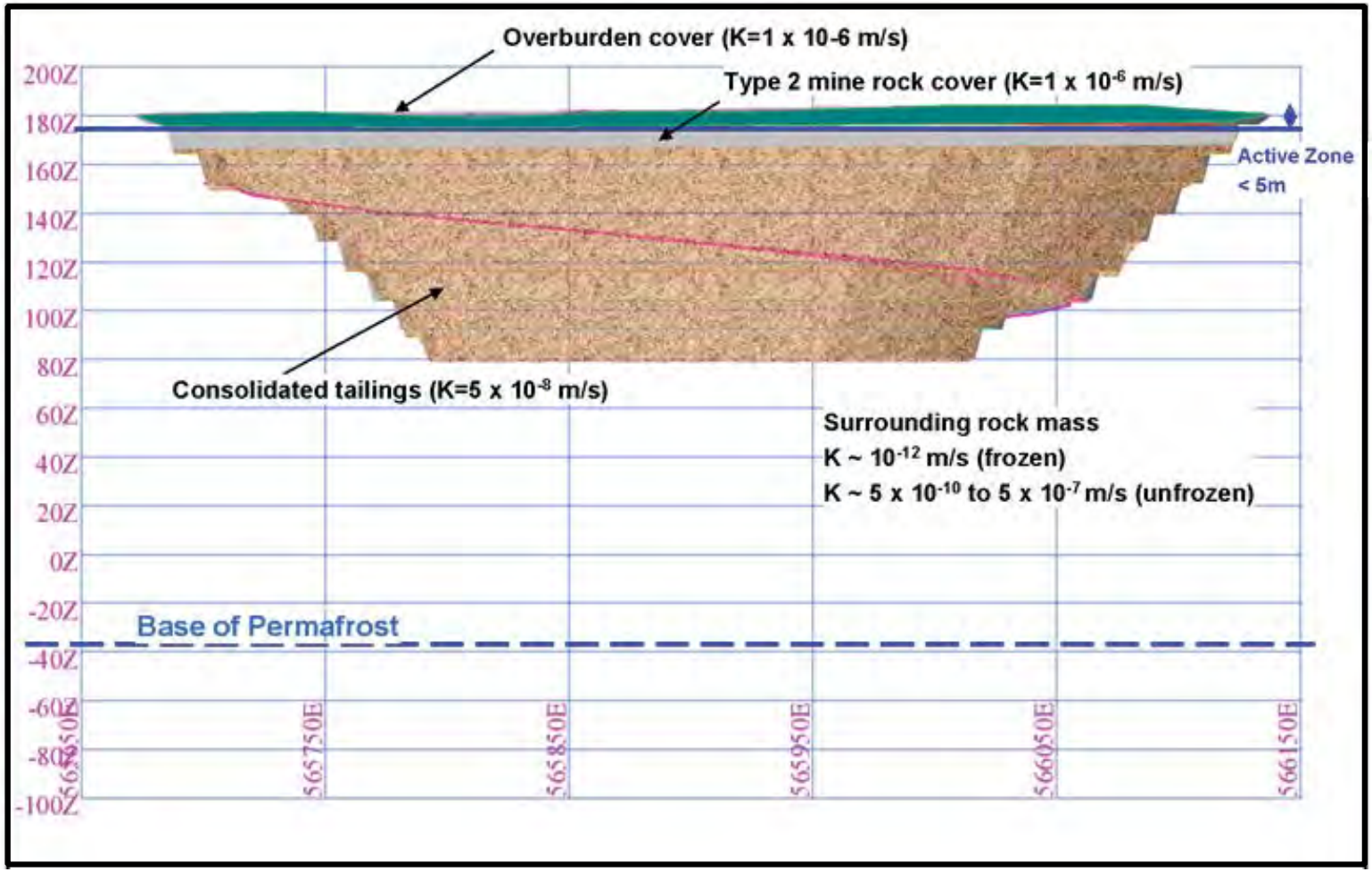

Figure 1-1: Conceptual Tailings Management Facility (AREVA 2011a)

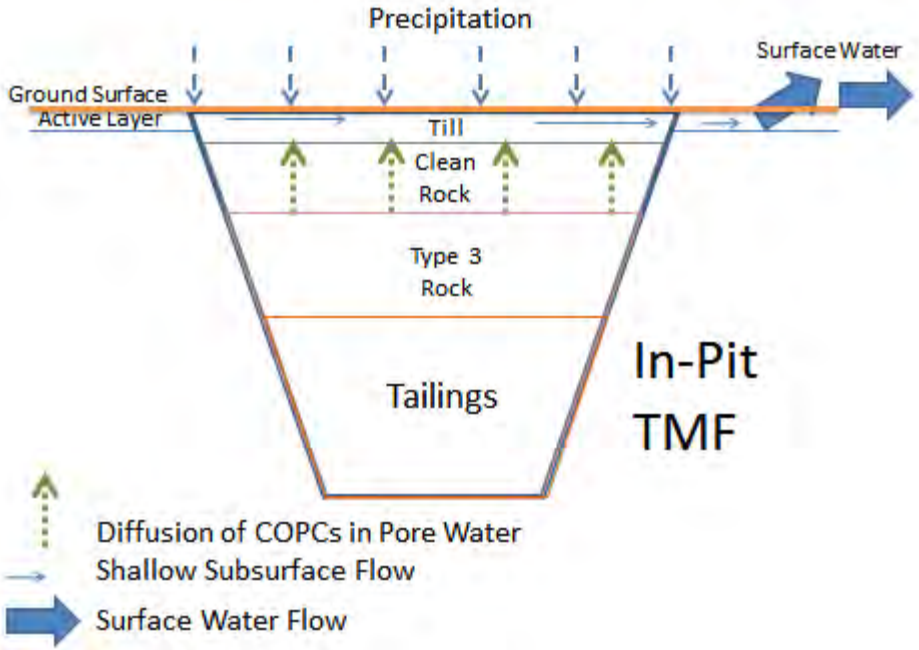

Figure 1-2: Conceptual Transport from Type 3 Mine Rock

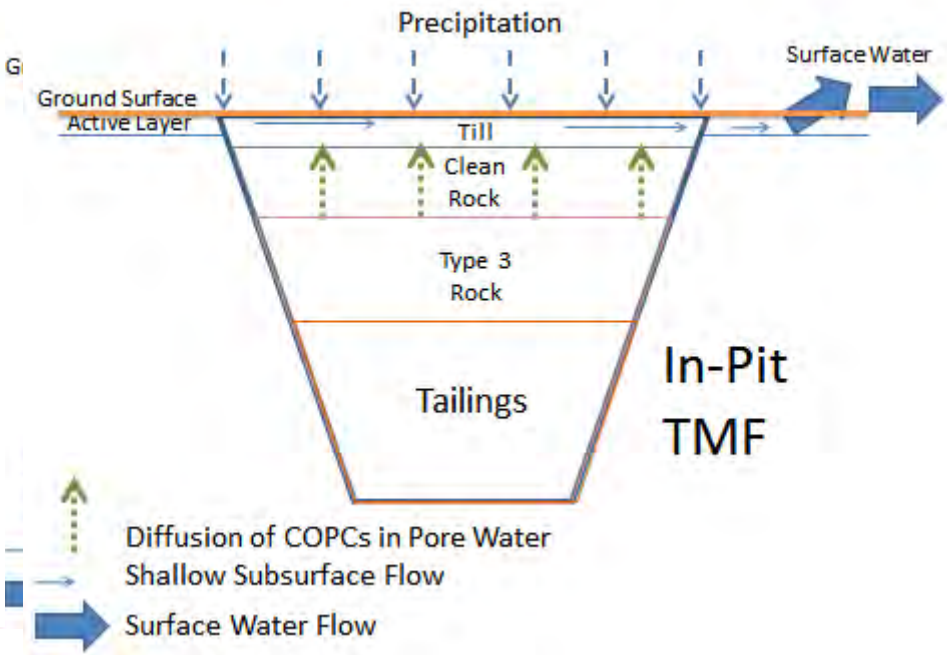

Figure 1-3: Conceptual Transport from Tailings

1.3 Objectives and Scope

Experimental testing was undertaken to generate the data needed to develop an understanding of the water quality effects on the environment and to produce source terms associated with tailings and mine rock that will be permanently stored underwater in mined out pits at the Kiggavik site. Data obtained from these tests, along with data from humidity cell tests on Type 3 mine rock, performed by EcoMetrix, (AREVA, 2011b), provided a basis for assessing water quality effects in the environment. Under the proposed in-pit TMF concept, surface water quality is expected to be governed by the diffusion of soluble constituents from the submerged tailings and the mine rock in the pit(s).

The scope of work for this geochemical assessment included the characterization of mine rock and tailings solids as well as the assessment of water quality associated with those solids during underwater storage. This report provides additional geochemical evaluation of the Type 3 mine rock, containing elevated sulphur and/or uranium contents, and tailings materials as well as a prediction of water quality associated with the proposed TMFs.

In addition to those documented in AREVA (2011b), other kinetic tests were performed to provide information on potential TMF water quality. One test, performed on Type 3 mine rock, incorporated fully submerged Type 3 mine rock materials from Kiggavik to assess the water quality source term associated with submerged Type 3 rock. A second test involved a layer of Kiggavik tailings overlain by Type 1 mine rock that were submerged and had an overlying column of water to assess diffusion rates and water quality resulting from underwater storage of tailings. The layered kinetic testing with tailings was intended to simulate the proposed TMFs that are planned to have tailings materials overlain by mine rock, which may be subsequently overlain by clean overburden/till at surface.

Although the focus of the testing was on the COPCs, other constituents, including calcium, magnesium, potassium and sodium were also assessed to determine diffusion coefficients for the in-pit scenarios. The additional constituents were considered to be non-reactive and therefore provide diffusion coefficients in the pore water with no chemical attenuation. Other COPCs are expected to be affected by chemical attenuation and the degree of attenuation can be estimated by comparing the results to those of the non-reactive constituents.

2.0 Laboratory Testing

The mine rock and tailings characterization study involved the selection and testing of representative materials from the tailings and the Type 3 mine rock that are proposed to be disposed of in TMFs at the Kiggavik site. Kinetic testing was performed on the submerged Type 3 mine rock materials in an acrylic column that was closed to the atmosphere except when samples were collected (**Figure 2-1**). The tailings materials were tested in duplicate columns that were overlain with Type 1 mine rock and an overlying water column that was exposed to air at the surface, see **Figure 2-2**. Humidity cell kinetic tests, originally documented in AREVA (2011b), were performed to assess the leaching properties of the Type 3 mine rock. Results from those humidity cells were then used to estimate potential loadings from the Type 3 mine rock.

A summary of the acid base accounting (ABA) characteristics and the solids content for select constituents for the mine materials used in the experimental setups are presented in **Table 2-1.** Full ABA characteristics and solids contents are presented in **Attachment A-1**. With the exception of uranium and selenium, the solids contents of most constituents in the tailings are similar to, or greater than the Type 3 mine rock. The uranium content of the Type 3 mine rock is approximately 50 times greater than that in the tailings. The higher uranium content in the mine rock compared to that in tailings is expected because the Type 3 mine rock has sub-economic uranium contents and the tailings represents materials in which the economic value of uranium has been extracted. The Type 1 mine

rock has lower constituent contents for most COPCs and is designated as clean waste rock that can be used as a construction material.

Figure 2-1: Type 3 Mine Rock Submerged Kinetic Test Configuration

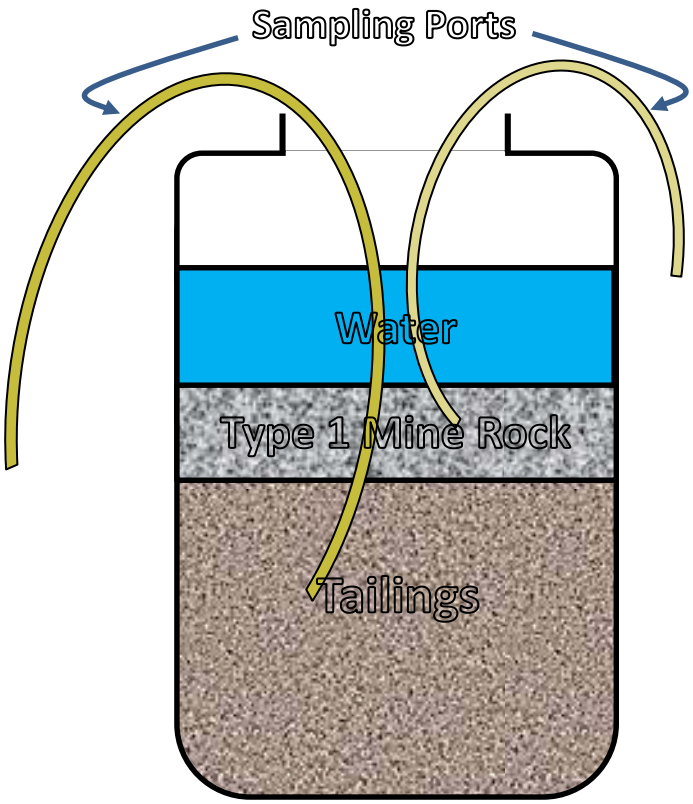

Figure 2-2: Layered Tailings and Type 1 Mine Rock Column Schematic

Table 2-1: Solids Chemistry Summary – Mine Rock and Tailings Materials

Constituent	Units	Submerged Column Test Material	Layered Column Test Materials	
		Type 3 Mine Rock	Tailings	Type 1 Mine Rock
Paste pH	--	8.1	7.9	8.4
Sobek Neutralization Potential	kg $CaCO_3$/tonne	4.6	9.6	4.9
Carbonate Neutralization Potential	kg $CaCO_3$/tonne	0.6	5.0	1.1
Acidification Potential	kg $CaCO_3$/tonne	0.31	0.62	0.31
Total Sulphur	% as S	0.007	3.42	<0.01
Sulphate (SO_4^{2-})	% as S	<0.01	3.40	<0.02
Sulphide (S^{2-})	% as S	0.01	0.02	<0.01
Total Carbon (C)	% as C	0.02	0.1	0.01
Carbonate (CO_3^{2-})	% as C	0.007	0.06	<0.01
Aluminum (Al)	mg/kg	11000	17000	8017
Arsenic (As)	mg/kg	0.7	15	<0.6
Cadmium (Cd)	mg/kg	0.09	0.09	<0.02
Calcium (Ca)	mg/kg	950	39000	495
Chromium (Cr)	mg/kg	32	380	6.6
Cobalt (Co)	mg/kg	5	10	1.2
Copper (Cu)	mg/kg	18	440	1.5
Iron (Fe)	mg/kg	14000	19000	16583
Potassium (K)	mg/kg	4300	6600	5217
Magnesium (Mg)	mg/kg	3800	4300	1563
Manganese (Mn)	mg/kg	55	110	17
Molybdenum (Mo)	mg/kg	21	48	0.9
Sodium (Na)	mg/kg	100	--	<100
Nickel (Ni)	mg/kg	20	220	7.3
Lead (Pb)	mg/kg	150	150	5.5
Antimony (Sb)	mg/kg	<0.8	<0.8	<0.55
Selenium (Se)	mg/kg	6.2	3.1	<0.57
Strontium (Sr)	mg/kg	22	66	23
Uranium (U)	mg/kg	1400	29	14
Vanadium (V)	mg/kg	66	180	17
Zinc (Zn)	mg/kg	20	86	3.2

2.1 Column Test on Submerged Type 3 Mine Rock

Kinetic testing on submerged rock was performed in a closed column to provide information on potential pore water chemistry related to Type 3 mine rock that is stored underwater. An acrylic column with an inner diameter of 15 cm and a height of 31 cm was filled with 6.8 kilograms of selected Type 3 crushed mine rock from Kiggavik drill core samples (**Figure 2-1**). The column was then completely filled with deionized water. Water in the column was circulated through the rock material prior to sampling to produce homogeneous samples representative of the pore water of the submerged rock. Each sample volume was replaced by the same volume of deionized water and the column sample ports were closed until the next sampling event. The column was sampled weekly for 24 weeks and bi-weekly for weeks 24 to 36. From weeks 4 to 36, one litre of water was removed for sampling resulting in a pore water residence time of approximately 27 days. Additional details of this phase of the Type 3 mine rock submerged column setup are presented in Appendix 5F of the AREVA EIS (2011b).

No samples were collected between weeks 36 and 126. During this time the columns were undisturbed and the mine rock remained submerged.

Sampling was re-initiated at week 126 with smaller sampling volumes (100 mL) to assess the mechanism controlling the pore water concentrations. Samples were collected weekly from weeks 126 to 149. During the second phase of sampling the residence time for pore water in the column was approximately 273 days.

All water samples were submitted to ALS-Vancouver for analysis of metals. The pH and conductivity of the samples were measured on the leachate immediately after collection.

2.2 Column Tests on Layered Tailings and Type 1 Mine Rock

The tailings column tests were performed to aid in the evaluation of leaching and diffusive transport of dissolved constituents in tailings pore water through a mine rock layer into the overlying water under a limited-to-no flow through condition in order to simulate an in-pit storage scenario. In this test the water level in the column was maintained at a fixed height over the tailings and mine rock to mimic the proposed TMF management strategy. Within the TMF, water near the water table surface, that is expected to be very close to the natural ground surface around the pit, will represent the active flow system through which water can migrate in and out of the backfilled pit as explained in more detail, below. Overlying water samples were therefore collected and analysed to simulate the TMF system. After sampling, deionized water was added to the overlying water layer to replace the sample volume.

These column tests were completed in duplicate, identified as Columns A and B. The general setup consisted of a known mass of tailings in a container overlain by a known mass of Type 1 mine rock. Pore water sampling ports were installed within both the tailings layer and the mine rock layer to measure pore water concentrations at the start and end of the tests (**Figure 2-2**). Pore water samples were collected and analyzed at the initialization of the test to assess initial conditions.

The columns were sampled weekly from weeks 1 to 33. Samples were submitted for analysis weekly from weeks 1 to 15. From weeks 15 to 29 samples were analysed bi-weekly. From weeks 1 to 17 the sample volume was 70 mL and from weeks 18 to 33 the sample volume was increased to 500 mL. At the termination of testing at week 48, final samples of overlying water and pore waters from the rock and tailings layers were collected and submitted for analysis.

All water samples were submitted to ALS-Vancouver for analysis of metals. The pH and conductivity of all samples were measured immediately after collection.

2.3 Humidity Cell Test on Type 3 Mine Rock

Data from humidity cell tests were used to predict potential pore water concentrations of the Type 3 mine rock. Details of the humidity cell test program were presented in AREVA (2011b).

Humidity cell testing was performed on Type 3 materials with an average uranium content of approximately 450 mg/kg and an average sulphur content of 0.18%. The humidity cell contained approximately 1 kg of Type 3 mine rock and was flushed weekly with 1.25 L of distilled water for 36 weeks. Leachate samples were submitted weekly for analysis.

3.0 Laboratory Results Summary

A summary of the column test results for the submerged Type 3 mine rock are presented in **Section 3.1**, results from layered tailings column tests are presented in **Section 3.2**, and pore water concentrations predicted from the humidity cell test are presented in **Section 3.3**.

3.1 Type 3 Mine Rock Submerged Column Kinetic Testing

The Type 3 mine rock test results can be divided into three phases. Phase One, from weeks 0 to 4, represented the initial flush of soluble constituents into the pore water of the flooded rock, this Phase is generally associated with the highest observed concentrations for most constituents.

Phase Two occurred after the initial flush period from weeks 4 to 36. Phase Two is demonstrative of pore water concentrations that would be expected after flushing by clean water with an approximate residence time of one month.

Phase Three was the final phase of testing from weeks 126 to 149 with a sampling volume of 100mL. This phase represented pore water concentrations after prolonged contact with the water and subsequent flushing with clean water with a residence time of about 40 weeks.

Results of the laboratory analysis on samples from the test are presented in **Attachment A-2**. **Attachment A-3** presents the calculated loading rates for all analysed constituents.

3.1.1 Phases One (Weeks 0-4) and Two (Week 4-36)

The time-trend concentration plots from testing for select COPCs during Phase One and Phase Two of testing are presented in **Figure 3-1** and the balance of COPCs are presented in **Attachment A-4**.

As seen in **Figure 3-1** and **Attachment A-4**, for the majority of COPCs, with the sole exception of aluminum, the most elevated concentrations were associated with the initial flush of COPCs in Phase One and concentrations steadily declined until approximately week 20 when relatively steady concentrations were observed. The maximum aluminum concentration in pore water was measured at week 19 of testing. The maximum pore water concentrations from the first four weeks of analysis, representing the initial flush of the rock's soluble load, and the average pore water concentrations from the final five weeks of Phase Two analysis, weeks 28 to 36 are presented in **Table 3-1**.

3.1.2 Phase Three (Weeks 126 to 149)

The time-trend concentration plots for select COPCs during Phase Three of testing are presented in **Figure 3-2** and the balance of COPCs are presented in **Attachment A-5**.

As presented in **Figure 3-2** and **Attachment A-5**, the majority of COPCs developed fairly stable concentrations during Phase Three of the test. The uranium concentrations initially demonstrated decreasing trends and began to stabilize in the latter weeks of testing. Sulphate concentrations initially exhibited increasing concentrations and began to stabilize in the latter weeks of testing. The aluminum concentrations were more variable during this Phase of testing but did not demonstrate either increasing or decreasing concentration trends.

The average pore water concentrations from the final five weeks of Phase Three testing, weeks 145 to 149, are presented in **Table 3-1**.

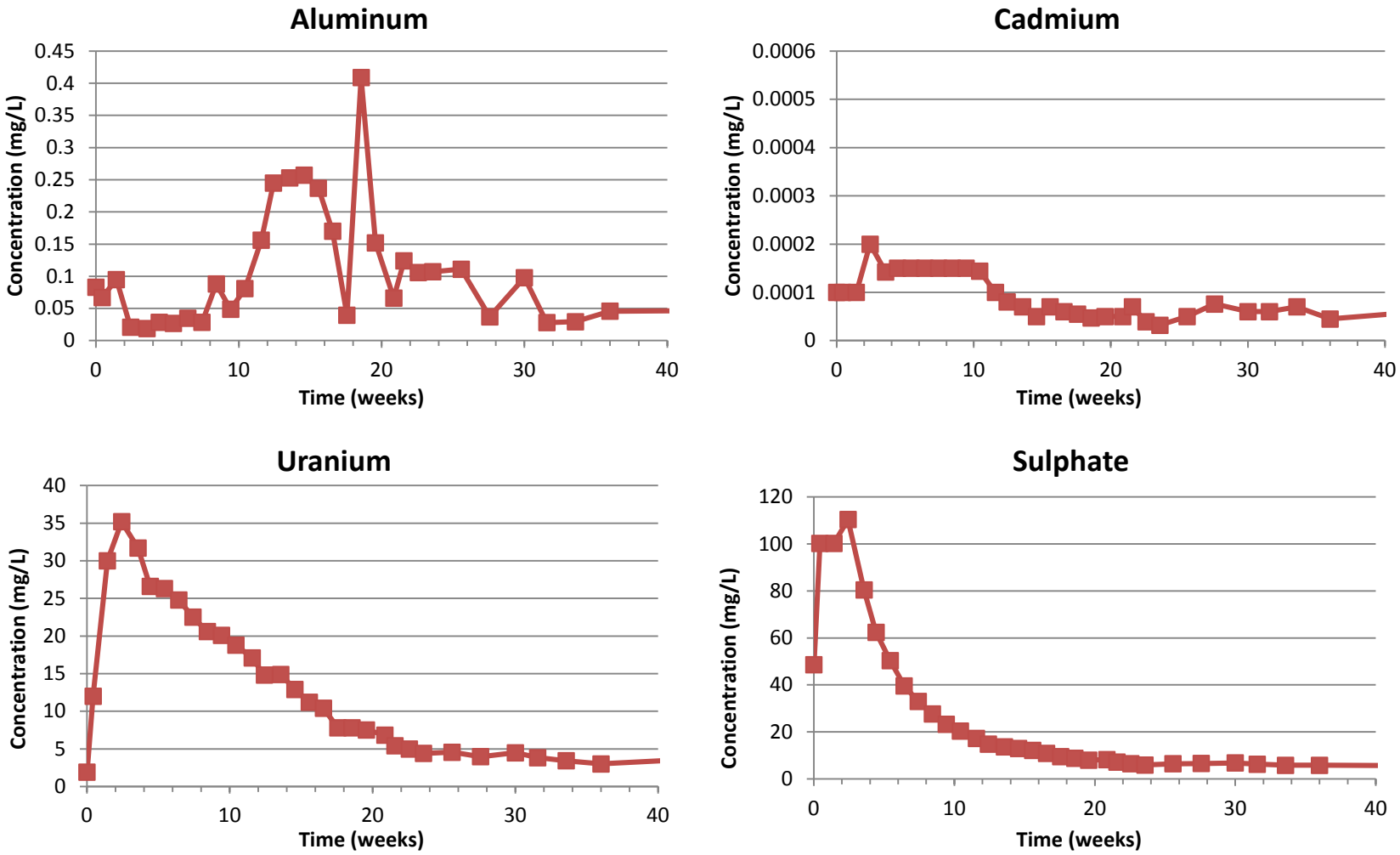

Figure 3-1 Submerged Column Kinetic Testing for Phase One and Phase Two – Aluminum, Cadmium, Uranium, and Sulphate Concentrations

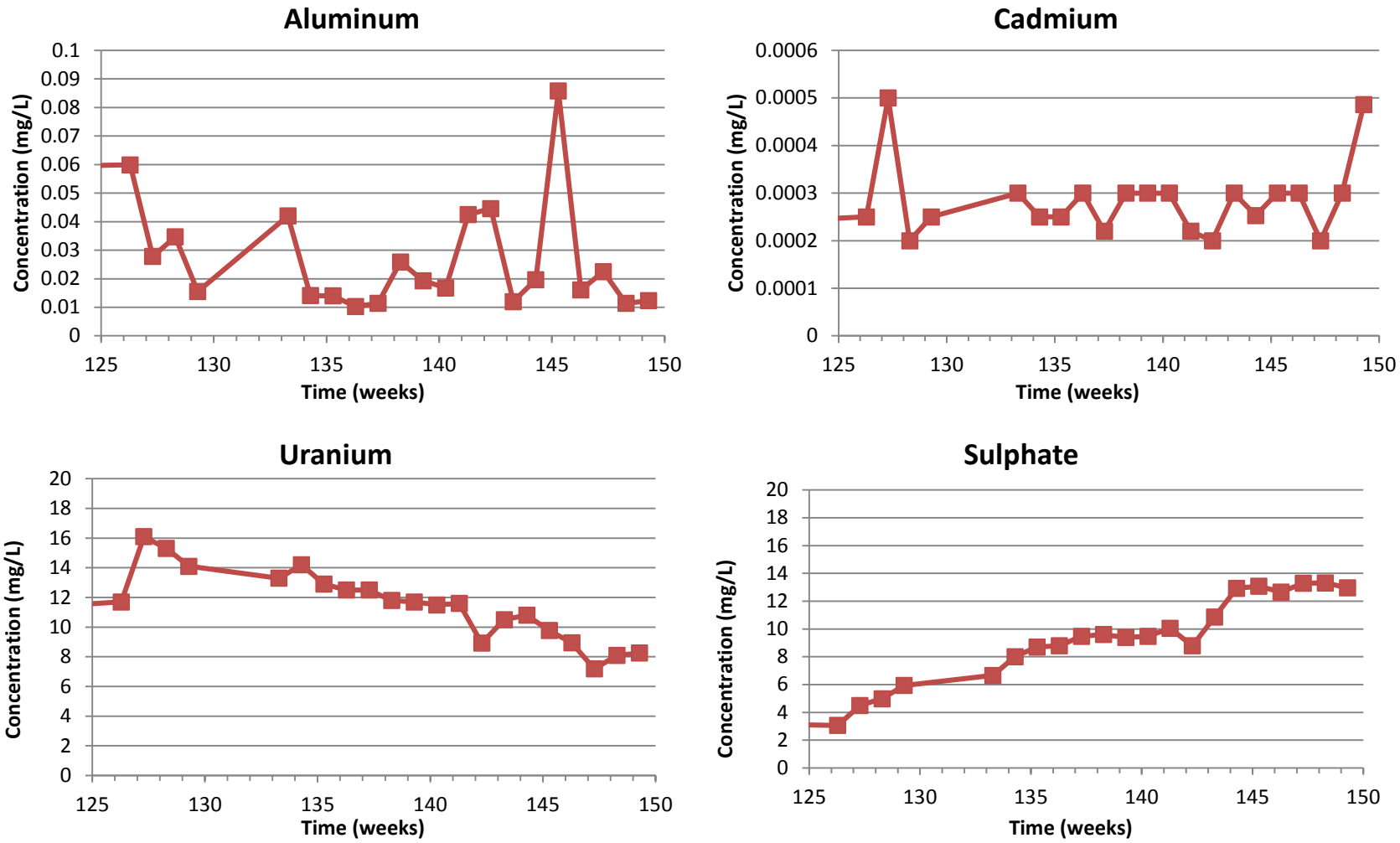

Figure 3-2 Submerged Column Kinetic Testing for Phase Three – Aluminum, Cadmium, Uranium, and Sulphate Concentrations

Table 3-1: Type 3 Mine Rock Submerged Column - Pore Water

Constituent	Units	Type 3 Mine Rock			
		Phase One Initial Soluble Load Flush	Phase Two Average from Weeks 28 to 36	Phase Three Average from Weeks 145 to 149	Upper-Bound Concentration
Sulphate (SO_4^{2-})	mg/L	110	6	13	110
Aluminum (Al)	mg/L	0.1	0.05	0.03	0.4
Arsenic (As)	mg/L	0.01	0.003	0.003	0.01
Calcium (Ca)	mg/L	41	7	14	41
Cadmium (Cd)	mg/L	<0.0002	<0.00006	<0.0003	<0.0005
Chromium (Cr)	mg/L	<0.005	0.0003	<0.0002	<0.005
Cobalt (Co)	mg/L	0.0009	<0.0001	<0.0002	0.0009
Copper (Cu)	mg/L	0.006	<0.0006	<0.0008	0.006
Iron (Fe)	mg/L	<0.1	<0.01	<0.02	<0.1
Potassium (K)	mg/L	16	5	7	16
Magnesium (Mg)	mg/L	17	3	6	17
Manganese (Mn)	mg/L	0.04	0.006	0.03	0.04
Molybdenum (Mo)	mg/L	1	0.2	0.9	1
Sodium (Na)	mg/L	18	2	3	18
Nickel (Ni)	mg/L	0.03	0.0008	<0.001	0.03
Lead (Pb)	mg/L	<0.0009	0.0002	0.0005	0.001
Antimony (Sb)	mg/L	0.0007	0.0004	<0.0002	0.0007
Selenium (Se)	mg/L	0.05	0.008	0.003	0.05
Strontium (Sr)	mg/L	0.4	0.07	0.2	0.4
Uranium (U)	mg/L	35	4	8	35
Vanadium (V)	mg/L	0.006	0.001	<0.002	0.006
Zinc (Zn)	mg/L	<0.005	<0.003	<0.003	<0.006

The steady concentrations observed during Phase Two of the test were likely low as a result of the constituent dilution resulting from the deionized water sample volume replacement and short residence time of water within the column (27 days). For the purposes of further analysis, the Phase Three average pore water concentrations as presented in **Table 3-1** were used as representative quasi-equilibrium concentrations for the submerged Type 3 mine rock. The Phase Three pore water concentrations represent pore water after prolonged contact with the Type 3 mine rock and subsequent clean water flushing with a residence time of approximately 40 weeks. Additionally, for conservatism, the maximum pore water concentrations measured at any point of this test were selected as conservative upper-bound values. These upper-bound concentrations are presented in **Table 3-1**. For the majority of COPCs, with the exception of aluminum, cadmium, lead, and zinc, this upper-bound concentrations were associated with the initial flush (Phase One) during the test.

3.2 Column Tests on Layered Tailings and Type 1 Mine Rock

The results of the laboratory analysis on the overlying water for all analysed constituents from Columns A and B of the test on the layered tailings are presented in **Attachment B-1** and **Attachment B-2**, respectively. **Attachment B-3** and **Attachment B-4** present the calculated mass flux rates in Columns

A and B, respectively. The sampling volume was adjusted from 70 mL to 500 mL at week 18. For many constituents, concentrations after week 18 exhibited decreases. This effect was largely due to the increased sample volumes and the required increase in dilution arising from overlying water replenishment. The sampling volumes were increased during the test deliberately to determine the sensitivity of the fluxes to the lower concentrations in the overlying water. The estimates of loading rates and fluxes of constituents are more conservative for the conditions of lower concentrations in the overlying water.

The time-trend concentrations and mass flux rate plots for select COPCs are shown in **Figure 3-2** and **Figure 3-4** and the full listing of COPCs are presented in **Attachment B-5** and **Attachment B-6**, respectively.

As seen in **Figure 3-4** and **Attachment B-5** for most COPCs the results from both columns are similar. While there were notable differences in the observed arsenic, manganese, and molybdenum concentration, the results of the calculated loading rates for both tests are similar for all COPCs.

The concentrations of many COPCs increased during the initial weeks of the tests in response to the small sample volumes and long residence time of the tests. The concentrations of a few COPCs were approaching steady state at or before week 15. After week 18, when the sample volume was increased to 500 mL, concentrations in the overlying water decreased, as expected, and many constituents approached new lower steady state values reflecting the larger replacement volumes and shorter residence time in the overlying water. The concentrations of most constituents approached steady state during the final weeks of testing. However, the selenium, strontium, uranium, and sulphate concentrations in both columns continued to decrease during the final weeks.

A tailings pore water sample was collected at the start of test and submitted for analysis. At week 48 final samples of overlying water and of pore waters from the tailings and Type 1 mine rock layers were also collected and analyzed. The results for all constituents are presented in **Attachment B-7**. The average concentrations from the start and end of the test were selected as representative of the tailings pore water concentration. The pore water concentrations in the Type 1 mine rock layer were only available from Column B because the sampling port in Column A was inoperable. The average pore water concentrations in the tailings and the in the Type 1 Mine Rock layer for selected COPCs are presented in **The layered** tailings tests were also used to estimate an effective diffusion coefficient for constituent transport through the layer of Type 1 mine rock using the observed flux rates for the non-reactive constituents, sulphate and magnesium. The effective diffusion coefficients for these two non-reactive constituents were found to be in good agreement with an overall effective diffusion coefficient of 1.8×10^{-10} m^2/s.

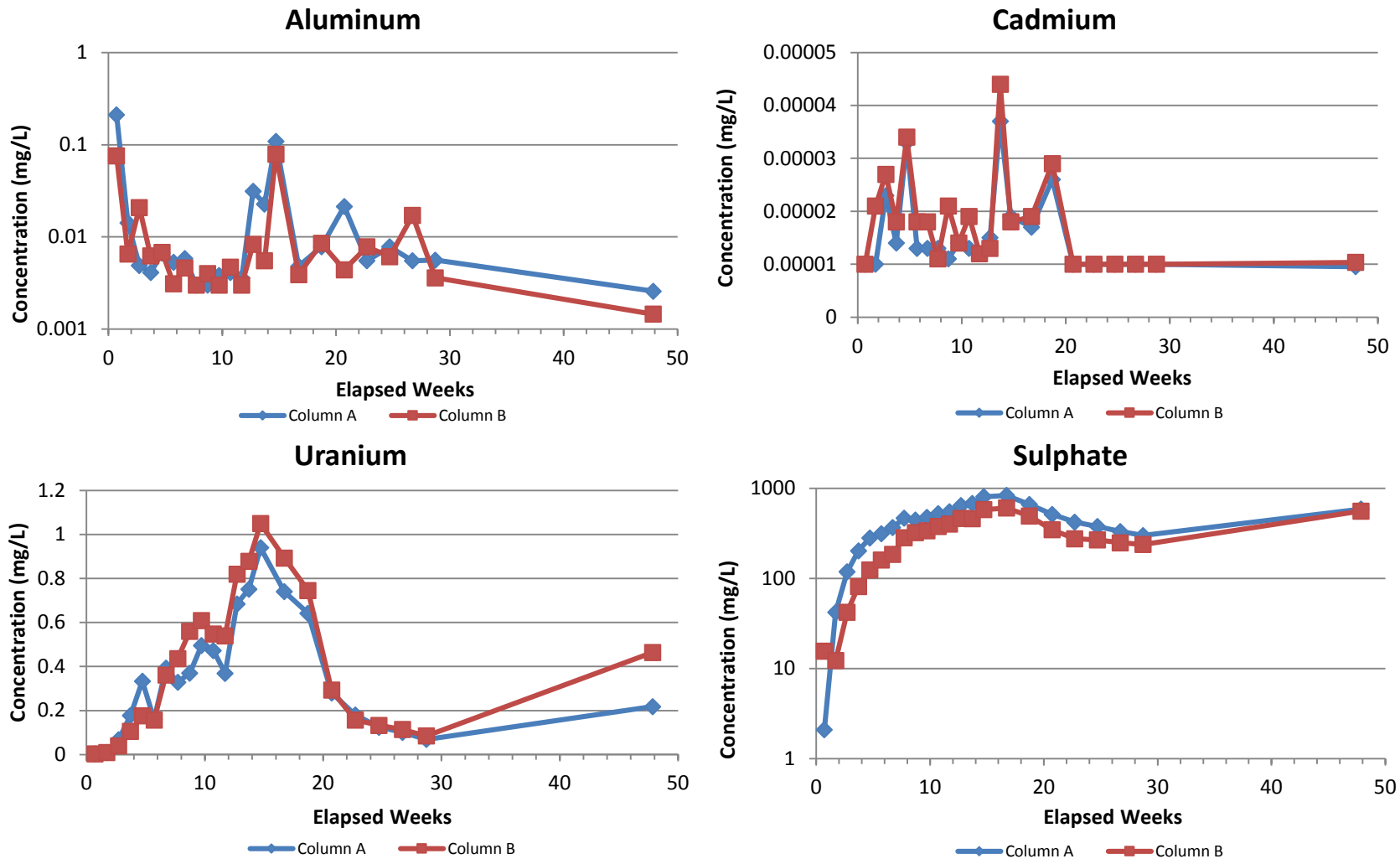

Figure 3-3 Layered Column Kinetic Testing – Overlying Water Aluminum, Cadmium, Uranium, and Sulphate Concentrations

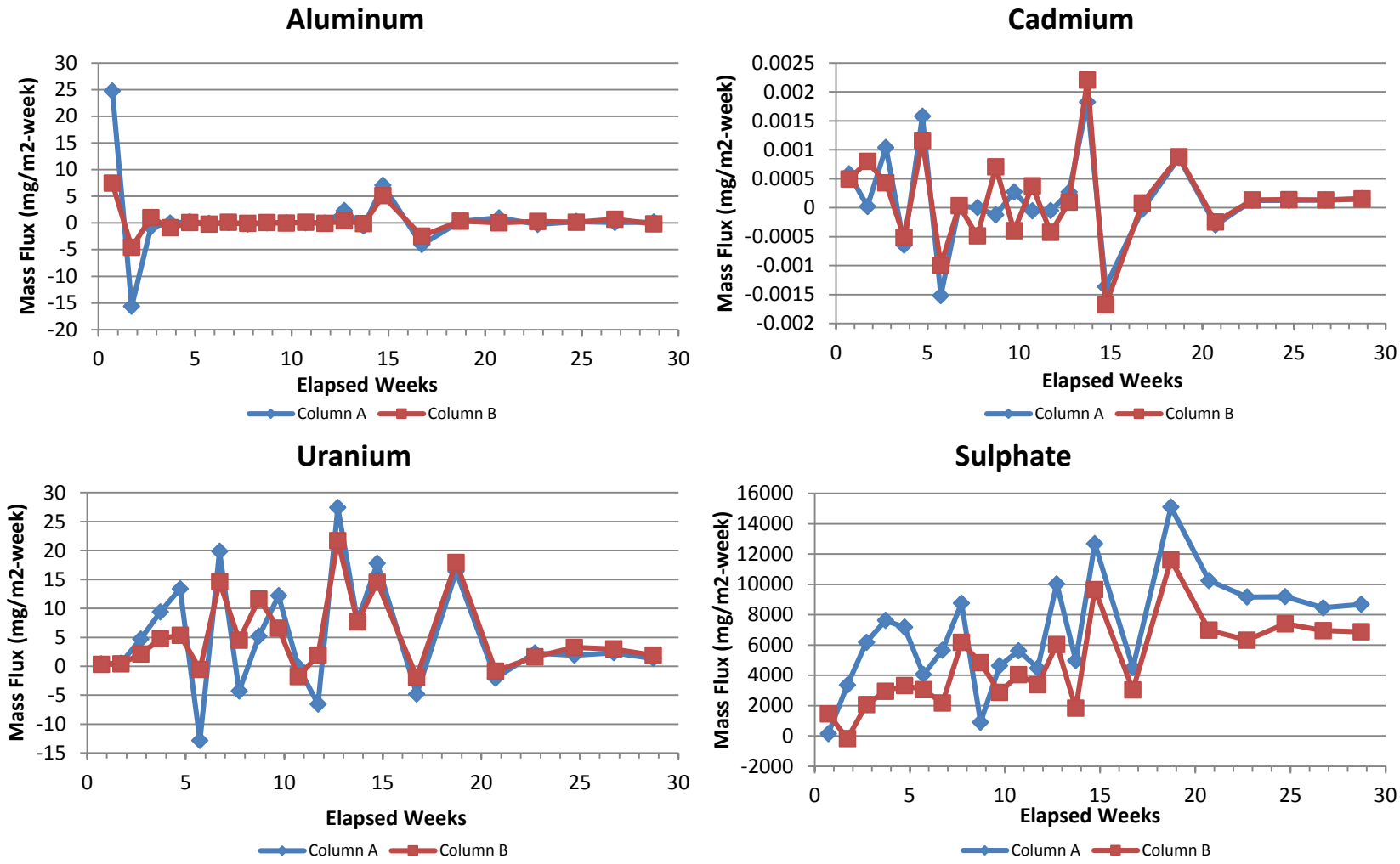

Figure 3-4 Layered Column Kinetic Testing – Overlying Water Aluminum, Cadmium, Uranium, and Sulphate Mass Flux Rates

Table 3-2.

The layered tailings tests were also used to estimate an effective diffusion coefficient for constituent transport through the layer of Type 1 mine rock using the observed flux rates for the non-reactive constituents, sulphate and magnesium. The effective diffusion coefficients for these two non-reactive constituents were found to be in good agreement with an overall effective diffusion coefficient of 1.8 x 10^{-10} m^2/s.

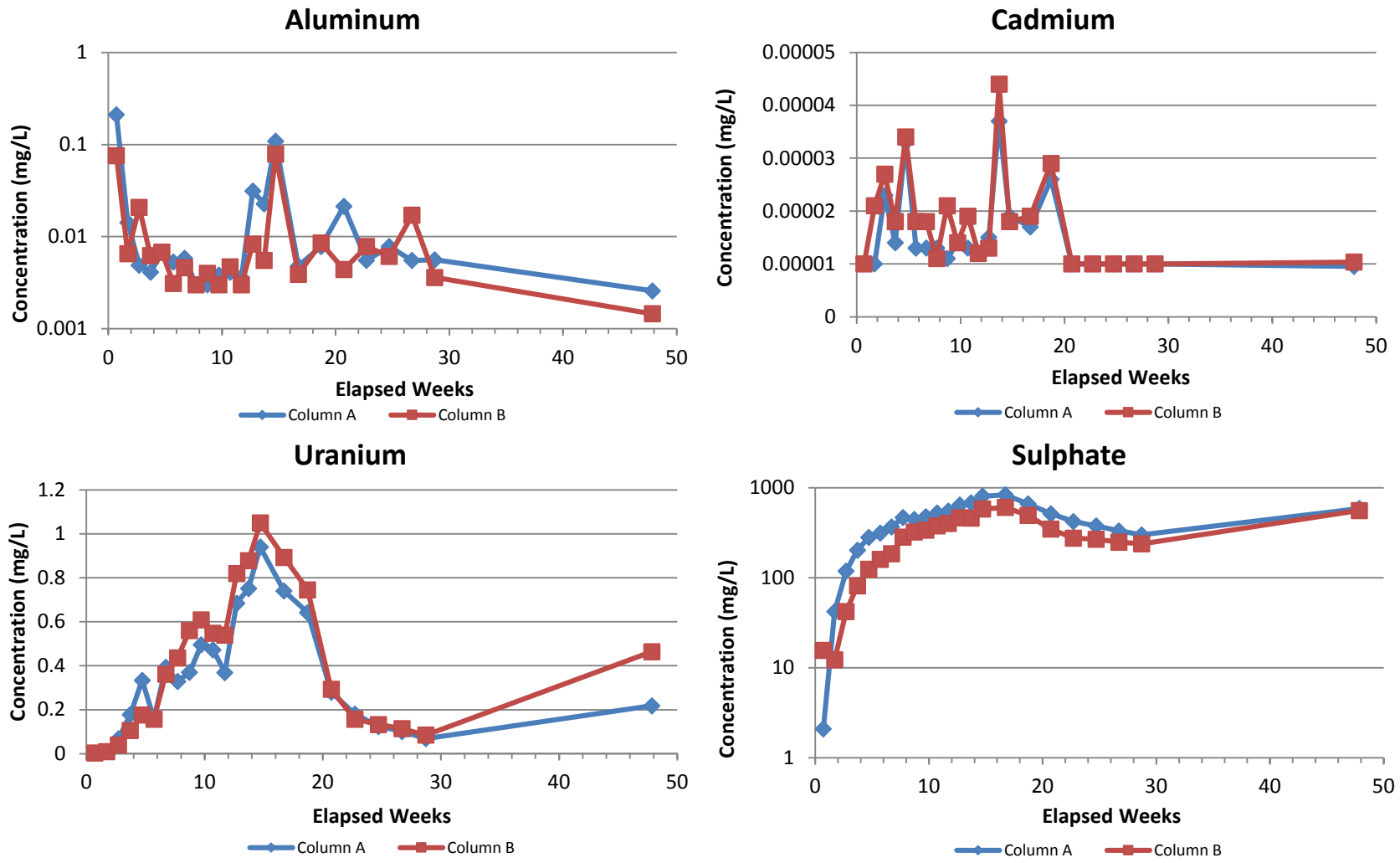

Figure 3-3 Layered Column Kinetic Testing – Overlying Water Aluminum, Cadmium, Uranium, and Sulphate Concentrations

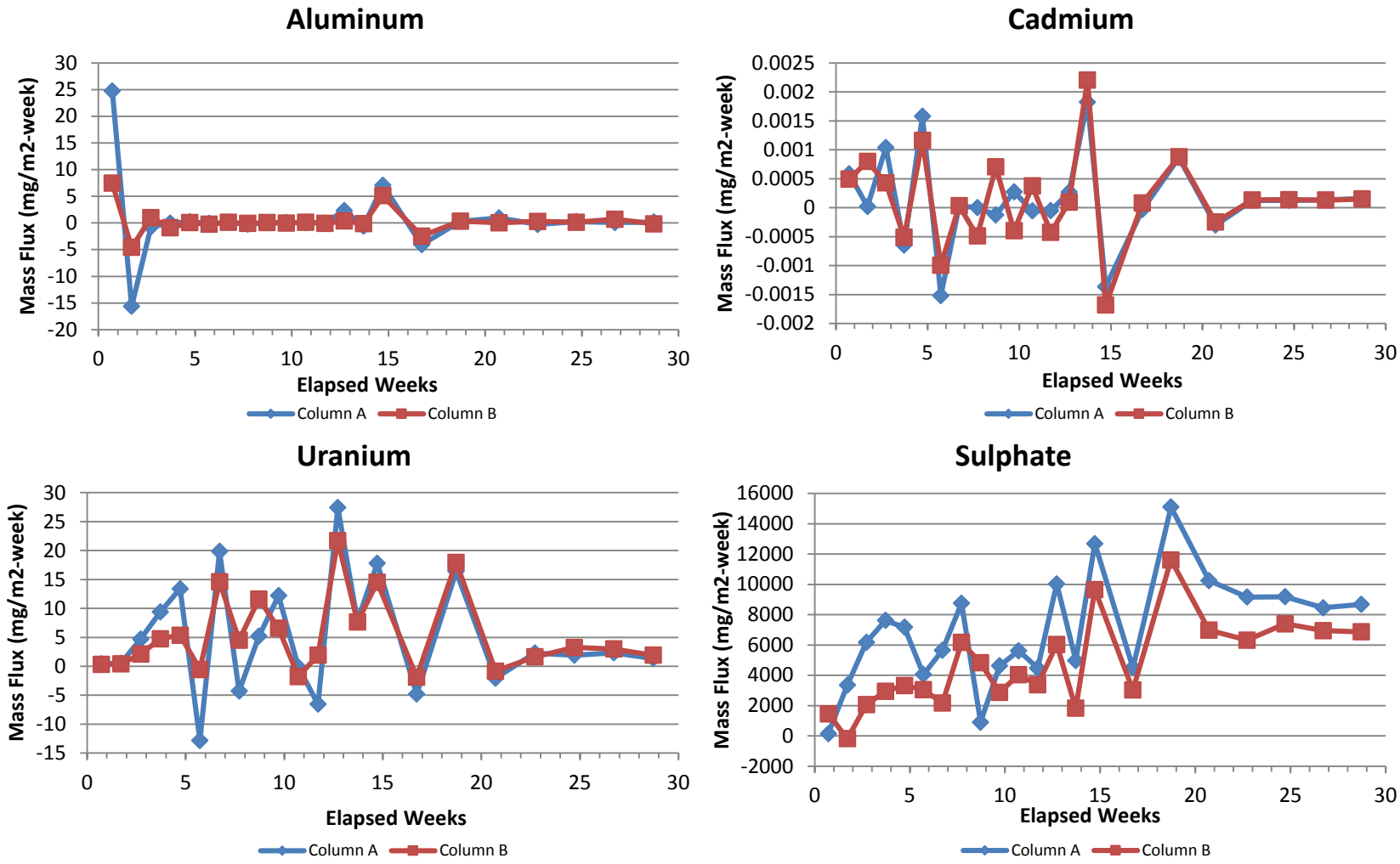

Figure 3-4 Layered Column Kinetic Testing – Overlying Water Aluminum, Cadmium, Uranium, and Sulphate Mass Flux Rates

Table 3-2: Pore Water – Tailings and Type 1 Mine Rock Materials

Constituent	Units	Layered Column Test Materials		
		Tailings		Type 1 Mine Rock
		Test Initialization	Test Termination	Test Termination
Sulphate (SO_4^{2-})	mg/L	9360	5055	1278
Aluminum (Al)	mg/L	<0.06	<0.009	<0.002
Arsenic (As)	mg/L	0.002	0.002	0.0003
Calcium (Ca)	mg/L	420	473	165
Cadmium (Cd)	mg/L	<0.0002	0.0001	<0.00002
Chromium (Cr)	mg/L	<0.002	<0.0008	<0.0002
Cobalt (Co)	mg/L	0.007	0.005	<0.0002
Copper (Cu)	mg/L	0.03	0.008	0.0004
Iron (Fe)	mg/L	<0.2	<0.08	<0.02
Potassium (K)	mg/L	704	224	116
Magnesium (Mg)	mg/L	2310	1065	286
Manganese (Mn)	mg/L	6	4	0.03
Molybdenum (Mo)	mg/L	0.3	0.3	0.07
Sodium (Na)	mg/L	51	25	13
Nickel (Ni)	mg/L	<0.01	<0.004	<0.001
Lead (Pb)	mg/L	0.002	0.001	<0.0001
Antimony (Sb)	mg/L	<0.002	<0.0008	<0.0002
Selenium (Se)	mg/L	0.02	0.01	0.001
Strontium (Sr)	mg/L	2	2	1
Uranium (U)	mg/L	0.2	0.1	0.9
Vanadium (V)	mg/L	0.05	0.1	<0.002
Zinc (Zn)	mg/L	<0.06	0.07	0.007

3.3 Humidity Cell Testing

Details of the humidity cell testing are provided in AREVA (2011b). The results of the laboratory analysis on the humidity cell leachate for all analysed constituents are presented in **Attachment C-1**. The time-trend concentration plots for select COPCs are shown in **Figure 3-5** and all COPCs are shown in **Attachment C-2**.

As can be seen in **Figure 3-5** and **Attachment C-2**, the concentrations of most COPCs slowly decreased over the first 19 weeks of testing and that from weeks 20 to 36 the concentrations of most constituents were roughly constant. The aluminum concentrations are an exception to this trend where the observed concentrations were largely constant over the duration of testing. These two time periods were used to develop loading rates representative of two phases of the humidity cell. The first phase, weeks 0-19, represents the initial flush of the humidity cell where oxidation products on the surface of the rock samples are readily removed. The second phase, weeks 20 to 36, is the steady-state period during which leachate concentrations and therefore, loading rates are roughly constant. Constituent

loadings from weeks 0-19 was selected to be representative of the initial flush of soluble loads while average values from weeks 20-36 were selected to be representative of steady state loading rates.

Laboratory loading rates derived from the humidity cell test were transformed into field loading rates by accounting for temperature and grain-size differences between the laboratory and field settings. A temperature correction factor is required because the laboratory testing was conducted at room temperature (20 to 25°C) while field temperatures for the stockpile will be approximately equal to the air temperatures at the Kiggavik site. At the site, the mean annual air temperature is -12° C and the mean annual surface temperature is -7° C (SRK, 2011). It was conservatively assumed that the temperatures within the rock stockpiles will be 5°C for eight months of the year and 0°C for the remaining months. In consideration of the difference in temperature and in the resulting change in reaction rate a correction factor of 0.117 was applied to the laboratory loading rates to estimate field loading rates.

A grain-size correction factor was used because the laboratory testing was conducted on fine grained crushed rock with higher specific surface areas than the materials that are expected to make up the Kiggavik rock stockpile. It was assumed that 5% of the material that makes up the Kiggavik rock stockpile will be of similar size as the material used in the humidity cell. For practical purposes, the fine grained material controls the loading rates of COPCs in waste rock stockpiles. Therefore, a factor of 0.05 was applied to the Kiggavik laboratory loading rates to estimate field loading rates in the temporary waste rock stockpiles.

Steady-state laboratory and field loading rates along with the initial soluble mass loads for COPCs as well as calcium, magnesium, potassium, and sodium are presented in **Table 3-3**. Additional details regarding the selection of the applied correction factors are documented in AREVA (2011b).

The field loading rates were then used to estimate the accumulated amount of soluble mass that will be released from the stockpile when the Type 3 mine rock is flooded. It is assumed that the Type 3 mine rock pile will be subjected to weathering on the land surface for 10 years (520 weeks) before being relocated to the pit(s) and flooded. It is also assumed that no soluble mass will be lost from the stockpile during these 10 years and that the entire soluble mass that accumulates during weathering of the temporary stockpile will dissolve in the pore water of the mine rock when it is relocated to the in-pit TMF and is flooded.

The total soluble mass (mg_{COPC}/kg) was estimated from the initial soluble mass load plus the sum of the steady-state loading rate applied for 520 weeks. This soluble mass was then converted to an equivalent pore water concentration by multiplying the soluble mass load by an estimated bulk density of 2000 kg/m^3 and divided by an estimated volumetric porosity of 0.4 for the flooded rock. The following equation illustrates the calculation used to predict the concentrations of COPCs in the pore water of the flooded rock after relocation.

$$Pore\ Water\ Concentration\ \left(\frac{mg}{L}\right) = \frac{(Mass\ Load_{Steady\ State} + Mass\ Load_{Initial\ Flush})\left(\frac{mg}{kg}\right) * Bulk\ Density\ \left(\frac{kg}{m^3}\right)}{Volumetric\ Porosity * \frac{1000L}{m^3}}$$

Table 3-4 presents the pore water concentrations for COPCs that are expected to develop within the Type 3 mine rock when the material is flooded after relocation.

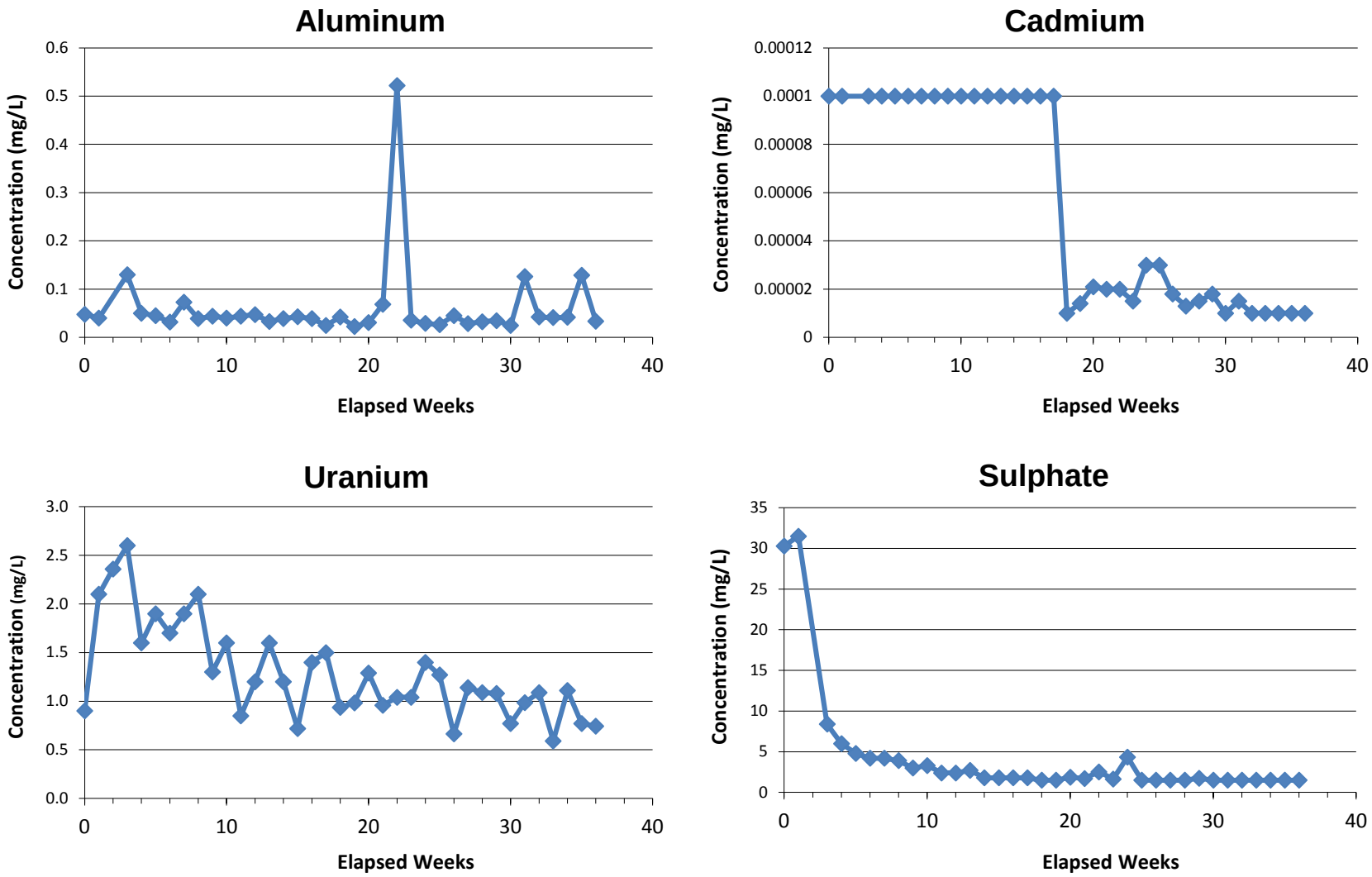

Figure 3-5 Humidity Cell Test on Type 3 Rock – Aluminum, Cadmium, Uranium, and Sulphate Concentrations

Table 3-3: Type 3 Mine Rock – Laboratory and Field Loading Rates

Constituent	Laboratory Loading Rates	Adjusted Field Loading Rates[1]	
	Steady State Loading Rate[2]	Steady State Loading Rate	Initial Soluble Mass[3]
	(mg/(kg-week))	(mg/(kg-week))	mg/kg
Sulphate (SO_4^{2-})	<2	<0.01	<1
Aluminum (Al)	0.06	0.0004	0
Antimony (Sb)	<0.0001	<7E-07	<0.0004
Arsenic (As)	0.0009	5E-06	<0.0002
Cadmium (Cd)	<0.00002	<1E-07	<0.00003
Calcium (Ca)	6	0.03	0.2
Chromium (Cr)	<0.0002	<1E-06	<0.0006
Cobalt (Co)	0.0005	3E-06	<0.0003
Copper (Cu)	<0.001	<6E-06	<0.0002
Iron (Fe)	<0.03	<0.0002	<0.01
Lead (Pb)	0.0002	1E-06	<0.0002
Magnesium (Mg)	1	0.006	<0.1
Manganese (Mn)	0.003	0.00002	<0.0002
Molybdenum (Mo)	0.08	0.0005	0.03
Nickel (Ni)	<0.001	<6E-06	<0.0003
Potassium (K)	0.6	0.004	<0.2
Selenium (Se)	0.0009	0.00001	<0.0006
Sodium (Na)	0.2	0.001	<0.1
Strontium (Sr)	0.04	0.0002	0.003
Uranium (U)	1	0.007	0.07
Vanadium (V)	0.003	0.00001	<0.0003
Zinc (Zn)	<0.004	<0.00002	<0.0004

Notes: 1) Grain size correction factor of 0.05 and temperature correction factor of approximately 0.117 were applied to convert from laboratory loading rate to adjusted field loading rate.
2) Steady state loading rate is the average loading rate from weeks 20-36 of humidity cell analysis.
3) Initial soluble mass was calculated from the first 19 weeks of humidity cell analysis.

Table 3-4: Estimated Concentrations in the Pore Water of the Type 3 Flooded Mine Rock

Constituent	Humidity Cell Type 3 Mine Rock
	mg/L
Sulphate (SO_4^{2-})	<38
Aluminum (Al)	0.9
Antimony (Sb)	<0.004
Arsenic (As)	<0.01
Cadmium (Cd)	<0.0005
Calcium (Ca)	84
Chromium (Cr)	<0.006
Cobalt (Co)	<0.01
Copper (Cu)	<0.02
Iron (Fe)	<0.5
Lead (Pb)	<0.004
Magnesium (Mg)	<15
Manganese (Mn)	<0.05
Molybdenum (Mo)	1
Nickel (Ni)	<0.02
Potassium (K)	<11
Selenium (Se)	<0.02
Sodium (Na)	<4
Strontium (Sr)	0.6
Uranium (U)	20
Vanadium (V)	<0.04
Zinc (Zn)	<0.06

4.0 Site Model Source Terms

Under the proposed "bathtub" in-pit TMF conceptual site model the surface water quality is governed by the diffusion of soluble constituents from the upper interface of either the tailings or from the Type 3 mine rock pore water, where we have high COPC concentrations, to the overlying water that will originate from rain and snowmelt, where we have lower COPC concentrations. The tailings will either be covered by a layer of Type 3 or Type 1 or 2 mine rock. Type 3 mine rock will, in turn, be covered by a layer of Type 1 or 2 mine rock that will be below a final layer of till at surface. Therefore, the pore water in either the tailings or in the Type 3 mine rock under the clean Type 1 or 2 mine rock will represent the source concentrations of COPCs, that can be transported upward by diffusion through the pore water in the clean rock layer to the active subsurface flow regime near the water table. The diffusive flux contributions of some COPCs will be dominated by transport from tailings while others will be dominated by those from Type 3 mine rock, depending on the pore water concentrations.

In the conceptual in-pit storage model it is assumed that a 10 m deep layer of clean mine rock (Type 1 or 2) will be placed over the Type 3 mine rock or tailings. The 10 m deep layer of clean mine rock will have negligible concentrations of COPCs in comparison to the tailings and Type 3 mine rock sources. A clean water layer within the upper zone or above the clean mine rock within the till represents the location where constituents will be transported to by diffusion and where COPCs will enter an active horizontal flow zone before entering the surface water environment. Under these conditions constituents in the pore water of either the tailings or Type 3 mine rock will diffuse through 10 m of clean Type 1 or 2 mine rock to enter the active flow of shallow subsurface water within the till layer. Prior to diffusion, the clean shallow water atop the clean mine rock layer is assumed to contain no COPCs (0 mg/L) and would provide a maximum flux from the tailings or Type 3 mine rock.

In the layered column tests, sulphate and magnesium were identified as non-reactive constituents that can be used to estimate effective diffusion coefficients for constituent transport through the layer of Type 1 mine rock without any chemical attenuation. The effective diffusion coefficients for these two non-reactive constituents was found to be 1.8×10^{-10} m^2/s. The use of these two non-reactive constituents to define an effective diffusion coefficient is conservative as alternative reactive constituents would be anticipated to have diffusion rates that would be affected by chemical retardation and would yield lower effective diffusion coefficients and lower flux values. The diffusion coefficient of 1.8×10^{-10} m^2/s was then applied to the other constituents to predict fluxes from the pore waters of both the tailings and the Type 3 mine rock. This diffusion coefficient was then applied to Fick's First law to determine flux rates for all COPCs under varying pore water concentration assumptions.

When the concentrations were based on their respective detection limits in the column tests, it was conservatively assumed that the concentration was equal to the detection limits reported.

Direct precipitation to the in-pit TMF was assumed to be the only source of water available to assimilate the flux of constituents from the tailings and mine rock in the flooded pit. Annual infiltration of 161.8 mm (or 162 $L/m^2/a$), calculated from the annual precipitation of 344.6 mm and annual evaporation of 182.8 mm, was adopted from AREVA (2011b). Additional water inflow sources such as local surface runoff would serve to further reduce predicted concentrations but were not considered in this assessment in order to remain conservative.

4.1 Pore Water Concentrations in Tailings and Flooded Type 3 Mine Rock

The pore water concentrations for the dominant loadings sources, tailings and Type 3 mine rock, are presented in **Table 4-1**. Tailings pore water concentrations were used directly as measured at the conclusion of the layered column test as originally presented in **Table 3-2**. Differing methods were used to estimate the potential chemistry of pore water in submerged Type 3 mine rock and this resulted in a range of potential concentrations for the COPCs. A summary of these approaches and the resulting concentrations is presented below:

- The conservative "Upper-Bound" pore water concentrations are the maximum concentrations measured at any point in time during the submerged Type 3 mine rock testing and are largely based on concentrations measured during the first 4 weeks of the column test. These pore water concentrations represent a reasonable upper-bound that can be used to predict the pore water in the Type 3 mine rock in the in-pit TMF.

- The "Quasi-Equilibrium" pore water concentrations are the average concentrations from weeks 145 to 149 of the submerged Type 3 mine rock test. These results represent quasi-equilibrium controlled steady state concentrations. These pore water concentrations represent a reasonable long-term steady state condition that can be used to predict long-term in-pit TMF water concentrations.

- The "Flooded Mine Rock from Temporary Rock Pile" pore water concentrations are the predicted concentrations from the soluble mass load that will be released from the Type 3 mine rock stockpile after the stockpile is subjected to weathering during 10 years of on-land storage and is then subsequently relocated to the pit and flooded. Those concentrations were estimated from the humidity cell loading rates.

The three estimates of pore water concentrations were used in the calculation of mass transport and in the prediction of water quality in drainage from the pit post-closure as discussed in **Section 5.0**.

Table 4-1: Summary of Concentrations in Pore Water in Tailings and Type 3 Mine Rock

Constituent	Units	Tailings	Type 3 Mine Rock		
			Column Testing		Humidity Cell Testing
		Layered Column Test[1]	Upper-Bound[2]	Quasi-Equilibrium[3]	Flooded Mine Rock from Temporary Rock Pile[4]
Sulphate (SO_4^{2-})	mg/L	5055	110	13	<38
Aluminum (Al)	mg/L	<0.009	0.4	0.03	0.9
Arsenic (As)	mg/L	0.002	0.01	0.003	<0.01
Calcium (Ca)	mg/L	473	41	14	84
Cadmium (Cd)	mg/L	0.0001	<0.0005	<0.0003	<0.0005
Chromium (Cr)	mg/L	<0.0008	<0.005	<0.0002	<0.006
Cobalt (Co)	mg/L	0.005	0.0009	<0.0002	<0.01
Copper (Cu)	mg/L	0.008	0.006	<0.0008	<0.02
Iron (Fe)	mg/L	<0.075	<0.1	<0.02	<0.5
Potassium (K)	mg/L	224	16	7	<11
Magnesium (Mg)	mg/L	1065	17	6	<15
Manganese (Mn)	mg/L	4	0.04	0.03	<0.05
Molybdenum (Mo)	mg/L	0.3	1	0.9	1
Sodium (Na)	mg/L	25	18	3	<4
Nickel (Ni)	mg/L	<0.004	0.03	<0.001	<0.02
Lead (Pb)	mg/L	0.001	0.001	0.0005	<0.004
Antimony (Sb)	mg/L	<0.0008	0.0007	<0.0002	<0.004
Selenium (Se)	mg/L	0.01	0.05	0.003	<0.02
Strontium (Sr)	mg/L	2	0.4	0.2	0.6
Uranium (U)	mg/L	0.1	35	8	20
Vanadium (V)	mg/L	0.1	0.006	<0.002	<0.04
Zinc (Zn)	mg/L	0.07	<0.006	<0.003	<0.06

Notes: 1) Pore water samples taken at the decommissioning of the Layered Tailings and Type 1 Mine Rock Column testing.

2) Upper-Bound concentration is the maximum concentration measured at any point during the Type 3 Mine Rock Submerged Column tests.

3) Quasi-Equilibrium concentration is the average concentration measured between weeks 145 to 149 of the Type 3 Mine Rock Submerged Column.

4) Concentrations calculated for Flooded Mine Rock from Temporary Rock Pile pore water use a volumetric porosity of 0.4, bulk density of 2000 kg/m^3, steady-state loading rates for a 10 year mine life, and an initial soluble mass load.

5.0 Results and Discussion

As originally presented in **Section 1.2,** the fluxes (F) of COPCs from the pore water in tailings and Type 3 mine rock were calculated as steady state values using Fick's First Law that is given as;

$$F = D_e (C_{pw} – C_{sw})/Z$$

in which D_e is the effective diffusion coefficient in the pore water, C_{pw} is the COPC concentration in the pore water of either the tailings or Type 3 mine rock, C_{sw} is the COPC concentration in the shallow water at the water table and Z is the thickness of the Type 1 or 2 mine rock overlying the tailings or Type 3 rock.

The predicted fluxes to the overlying water for each COPC are presented in **Table 5-1**. Fluxes for all constituents are presented in **Attachment D-1**. The uncertainty in the potential pore water concentrations of the flooded Type 3 mine rock results in a range of fluxes of COPCs.

In consideration of the range of potential Type 3 mine rock pore water concentrations it was found that the fluxes of aluminum, arsenic, cadmium, molybdenum, and uranium were always greatest from the Type 3 mine rock pore water regardless which pore water assumptions were used. Conversely, sulphate, manganese, strontium, vanadium, and zinc fluxes were always greatest from the tailings materials. The dominant source of antimony, chromium, cobalt, copper, iron, lead, nickel, lead, and selenium fluxes were found to be alternate between tailings and Type 3 mine rock depending on which Type 3 mine rock pore water concentrations were used to calculate the flux.

Table 5-1: Predicted Flux Rates

Constituent	Tailings	Type 3 Mine Rock		
		Column Testing		Humidity Cell Testing
		Upper-Bound	Quasi-Equilibrium	Flooded Mine Rock from Temporary Rock Pile
	(mg/m^2-s)			
Sulphate (SO_4^{2-})	9.3E-05	2.0E-06	2.4E-07	7.0E-07
Aluminum (Al)	1.7E-10	7.5E-09	5.4E-10	1.7E-08
Arsenic (As)	3.7E-11	2.3E-10	6.1E-11	2.7E-10
Cadmium (Cd)	2.3E-12	9.2E-12	5.8E-12	8.3E-12
Chromium (Cr)	1.4E-11	9.2E-11	3.5E-12	1.1E-10
Cobalt (Co)	8.7E-11	1.7E-11	3.3E-12	1.8E-10
Copper (Cu)	1.5E-10	1.1E-10	1.5E-11	2.8E-10
Iron (Fe)	1.4E-09	1.8E-09	3.4E-10	8.8E-09
Manganese (Mn)	7.3E-08	7.7E-10	5.2E-10	9.2E-10
Molybdenum (Mo)	6.0E-09	2.4E-08	1.7E-08	2.6E-08
Nickel (Ni)	7.6E-11	4.6E-10	1.9E-11	3.1E-10
Lead (Pb)	1.9E-11	1.9E-11	1.0E-11	7.0E-11
Antimony (Sb)	1.4E-11	1.3E-11	3.9E-12	6.9E-11
Selenium (Se)	1.8E-10	8.5E-10	5.0E-11	3.0E-10
Strontium (Sr)	3.1E-08	7.7E-09	2.9E-09	1.2E-08
Uranium (U)	2.4E-09	6.5E-07	1.6E-07	3.6E-07
Vanadium (V)	2.1E-09	1.1E-10	3.5E-11	7.4E-10
Zinc (Zn)	1.4E-09	1.1E-10	4.8E-11	1.1E-09

The COPCs that diffuse upward will mix with the net precipitation resulting in concentrations in the surface water outflow from the pit as shown in **Table 5-2**. The predicted concentrations represent conservative estimates in the outflow from a pit of any size because both the flux of COPCs upward from the submerged tailings or mine rock and the precipitation are “per unit area” quantities across the area of the pit. Predicted outflow concentrations for all constituents are presented in **Attachment D-2**.

As shown in **Table 5-2**, if the COPC source is the tailings pore water then all surface water concentrations are below both the CCME concentrations for the Protection of Freshwater Aquatic Life and the Health Canada guidelines for Canadian Drinking Water. If the COPC source is the Type 3 mine rock pore water then all COPCs, with the sole exception of uranium, are predicted to be below both the CCME concentrations for the Protection of Freshwater Aquatic Life and the Health Canada guidelines for Canadian Drinking Water at the in-pit TMF regardless of the approach used to determine the type 3 pore water concentration. Using the most conservative upper-bound uranium pore water concentrations in Type 3 mine rock, the surface water concentration was estimated to be 0.1 mg/L or approximately 7 times greater than the most sensitive water quality criteria of 0.015 mg/L.

The uranium concentration in the shallow water outflow from the pit is predicted to exceed both the Water Quality Guidelines for the Protection of Freshwater Aquatic Life and the Health Canada Guidelines for Canadian Drinking Water for Type 3 mine rock below the Type 1 or 2 rock layer. However, uranium leaching is directly correlated with bulk uranium content of the mine rock and Type

3 mine rock uranium content may occur within a range between 250 and 1500 mg/kg. If the bulk uranium contents of Type 3 rock used in the analytical testing are representative, then additional mitigation may be required to meet water quality criteria with respect to uranium. If the uranium content of the Type 3 material is lower than those in the tested materials, then the predicted concentrations in the pit outflow could also be lower than those predicted here and may not require additional mitigation.

5.1 Potential Mitigation Measures

The elevated concentration of uranium in the pore water of the flooded Type 3 rock is the primary driver for predicting elevated concentrations in the pit outflow water. The primary and dominant transport mechanism for uranium and other COPCs from the Type 3 pore water to the shallow water that will be actively flowing out of the pit is diffusion that is controlled by the concentration difference between the pore water and the shallow pit water. The predicted flux was based on a measured diffusion coefficient that does not account for chemical attenuation. Mitigation strategies to decrease the flux of uranium from pore water to the shallow active water in the pit should therefore focus on the controlling the concentration in the pore water or limiting the upward flux by effective chemical attenuation of the uranium flux. There are several potential mitigation methods that are based on those strategies.

Control of uranium concentrations in the flooded Type 3 rock can be achieved by treatment of the Type 3 rock before or as it is being relocated to the pit for final and permanent storage. Soluble uranium and other constituents will form in the moisture on the rock surfaces while the rock weathers during temporary storage on-land prior to the end of mining. The rock can be tested, before being relocated, to quantify the amounts of soluble uranium and other constituents. The results of the tests will provide a basis to determine the concentrations in the pore water after relocation to the pit and flooding of the rock. If the concentrations are high enough to cause undesirable effects in the surface water drainage from the pit, then the rock would be treated prior to or during relocation. Treatment to remove uranium from water can consist of pH adjustment with lime, for example, that will precipitate the uranium as a solid on the rock surfaces. Uranium removal can also be accomplished by addition of ferric sulphate. The iron in the ferric sulphate will precipitate and the uranium will sorb to the iron oxyhydroxide solids. These reagents can be added to the rock in liquid form in order to get good mixing prior to placement of the rock in the pit. For example, spray bars can be used to spray the reagents onto the rock in the trucks while being hauled to the pit. The required doses of reagents would be based on test results that determined the soluble masses of uranium that required treatment. Efficient removal of uranium may require a combination of lime and ferric sulphate addition. The treatment and other mitigation methods can be tested in the laboratory, initially, to select a preferred method and then refined during the operation on rock at the field scale to confirm the treatment performance.

Chemical attenuation is another approach that can be applied to reduce uranium concentrations in the surface water outflow from the pit. At the closed Cluff Lake uranium mine in northern Saskatchewan, it has been demonstrated that uranium is chemically attenuated as water with elevated uranium concentrations migrates through organic lake sediments. The organic carbon in the sediments causes a change in the redox form of uranium from the +6 to the +4 oxidation state and results in precipitation of the uranium as a UO_2 solid. This process can form the basis of mitigating uranium from the Type 3 rock.

After relocation to the pit, the Type 3 rock can be covered by organic materials that will originate from areas prepared for pit excavation. Those materials will be stockpiled at the start of the operation and will be available for use. The elevated uranium in pore water in the Type 3 rock will diffuse upward into the cover where the redox transformation and precipitation will occur. This will effectively prevent

uranium transport to the shallow water in the pit and therefore also prevent elevated uranium in the surface water outflow from the pit. Again, this method can be tested in the laboratory to determine preferred approaches and can then be tested at the site during operations to refine methods and verify performance.

With mitigation measures it is predicted that the in-pit TMF uranium concentrations could be managed to meet water quality criteria in downstream surface water. If the updated mine rock characteristics show that mitigation of the relocated Type 3 rock is required, a test program will be designed to develop the appropriate design criteria for effective mitigation.

Table 5-2: Predicted Surface Water Concentrations in Outflow from the Backfilled Pit

Constituent	Units	Water Quality Guideline for the Protection of Freshwater Aquatic Life[1] (mg/L)	Health Canada Guidelines for Canadian Drinking Water[2] (mg/L)	Tailings	Type 3 Mine Rock		
					Column Testing		Humidity Cell Testing
					Upper-Bound	Quasi-Equilibrium	Flooded Mine Rock from Temporary Rock Pile
Sulphate (SO_4^{2-})	mg/L	N/A	500	18	0.4	0.05	0.1
Aluminum (Al)	mg/L	0.005	0.1	0.00003	0.001	0.0001	0.003
Arsenic (As)	mg/L	0.005	0.01	0.000007	0.00005	0.00001	0.00005
Cadmium (Cd)	mg/L	5E-06[3]	0.005	0.0000004	0.000002	0.000001	0.000002
Chromium (Cr)	mg/L	0.0089	0.05	0.000003	0.00002	0.0000007	0.00002
Cobalt (Co)	mg/L	N/A	N/A	0.00002	0.000003	0.0000006	0.00003
Copper (Cu)	mg/L	0.002	1	0.00003	0.00002	0.000003	0.00005
Iron (Fe)	mg/L	0.3	0.3	0.0003	0.0004	0.00007	0.002
Manganese (Mn)	mg/L	N/A	0.05	0.01	0.0002	0.0001	0.0002
Molybdenum (Mo)	mg/L	0.073	N/A	0.001	0.005	0.003	0.005
Nickel (Ni)	mg/L	0.025	N/A	0.00001	0.00009	0.000004	0.00006
Lead (Pb)	mg/L	0.001	0.01	0.000004	0.000004	0.000002	0.00001
Antimony (Sb)	mg/L	N/A	0.006	0.000003	0.000003	0.0000008	0.00001
Selenium (Se)	mg/L	0.001	0.01	0.00003	0.0002	0.00001	0.00006
Strontium (Sr)	mg/L	N/A	N/A	0.006	0.001	0.0006	0.002
Uranium (U)	mg/L	0.015	0.02	0.0005	**0.1**	**0.03**	**0.07**
Vanadium (V)	mg/L	N/A	N/A	0.0004	0.00002	0.000007	0.0001
Zinc (Zn)	mg/L	0.03	5	0.0003	0.00002	0.000009	0.0002

Notes:

1) Canadian Council of Ministers of the Environment (CCME) – Water Quality Guidelines for the Protection of Aquatic Life (CCME 2013).
2) Health Canada Guidelines for Canadian Drinking Water Quality - Summary Table (HC 2012).
3) Cadmium Water Quality Guideline for the Protection of Freshwater Aquatic Life concentration calculated using a water hardness of 10 mg/L as $CaCO_3$.

6.0 Conclusions

This assessment has shown that, except for uranium, all COPCs are expected to remain below levels that are protective of local water quality and the environment. A conservative assessment showed that the Type 3 mine rock with elevated uranium contents may result in elevated uranium concentrations in the shallow pit pore water and pit outflow that may exceed water quality guidelines for the protection of aquatic life unless additional mitigation measures are employed when the rock is relocated to the pit for permanent storage.

The uranium contents of the Type 3 mine rock in the stockpiles will be refined with additional characterization and testing during the operation of the mine. It is recognized that if the uranium content of the Type 3 mine rock stockpile materials differs substantially from the materials used in humidity cell and submerged column tests considered in this assessment, then the predicted uranium concentration at the in-pit TMF surface water may need to be re-evaluated and refined as well. If the materials analysed in the humidity cell and submerged column are representative of the proposed Type 3 mine rock then mitigation measures may be necessary to manage surface water quality at the proposed in-pit TMFs.

Mitigations measures such as treatment of the rock before or during relocation or covering the rock by organics in the pit are expected to be effective for reducing uranium concentrations in the surface water to levels that would meet water quality standards.

7.0 References

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ATTACHMENT A-1

Solids Chemistry Summary – Mine Rock and Tailings Materials

Solids Chemistry Summary - Mine Rock and Tailings Materials

Parameter	Units	Submerged Column Test	Layered Column Test Materials	
		Type 3 Mine Rock	Tailings	Type 1 Mine Rock
Paste pH	--	8.1	7.9	8.4
Fizz Rate	--	1	3	3
Sample weight	g	2.03	2.02	2.07
HCl added	mL	20	35.1	20
HCl	Normality	0.1	0.1	0.1
NaOH	Normality	0.1	0.1	0.1
Vol NaOH to pH=8.3	mL	18.12	31.20	17.98
Final pH	--	1.18	1.84	0.95
Sobek Neutralization Potential	kg $CaCO_3$/tonne	4.60	9.60	4.90
Carbonate Neutralization Potential	kg $CaCO_3$/tonne	0.6	5.0	<1.1
Acidification Potential	kg $CaCO_3$/tonne	0.31	0.62	0.31
Net Neutralization Potential	kg $CaCO_3$/tonne	4.29	8.98	4.59
Net Carbonate Neutralization Potential	kg $CaCO_3$/tonne	0.3	4.4	0.8
Neutralization Potential / Acidification Potential	--	14.8	15.4	15.8
Carbonate Neutralization Potential / Acidification	--	1.9	8.1	<3.7
Total Sulphur	% as S	0.01	3.42	<0.015
Sulphate (SO_4^{2-})	%	<0.01	3.40	<0.015
Sulphide (S^{2-})	% as S	0.01	0.02	<0.01
Total Carbon (C)	% as C	0.02	0.1	0.01
Carbonate (CO_3^{2-})	% as C	0.01	0.06	<0.014
Total Organic Carbon	% as C	--	0.03	<0.01
Ag	mg/kg	--	0.8	0.05
Al	mg/kg	11000	17000	8017
As	mg/kg	0.7	15	<0.6
Au	mg/kg	--	--	<0.2
B	mg/kg	--	--	40
Ba	mg/kg	33	250.00	13
Be	mg/kg	1.4	2.4	0.8
Bi	mg/kg	14	8.4	0.2
Ca	mg/kg	950	39000	495
Cd	mg/kg	0.09	0.09	<0.02
Ce	mg/kg	--	--	110
Co	mg/kg	5	10	1.2
Cr	mg/kg	32	380	6.6
Cs	mg/kg	--	--	3.3
Cu	mg/kg	18	440	1.5
Fe	mg/kg	14000	19000	16583
Ga	mg/kg	--	--	5.5
Ge	mg/kg	--	--	<0.05
Hf	mg/kg	--	--	0.5
Hg	mg/kg	<0.1	--	0.03
In	mg/kg	--	--	<0.005
K	mg/kg	4300	6600	5217
La	mg/kg	--	--	65

Solids Chemistry Summary - Mine Rock and Tailings Materials

Parameter	Units	Submerged Column Test	Layered Column Test Materials	
		Type 3 Mine Rock	Tailings	Type 1 Mine Rock
Li	mg/kg	27	61	16
Mg	mg/kg	3800	4300	1563
Mn	mg/kg	55	110	17
Mo	mg/kg	21	48	0.9
Na	mg/kg	100	--	<100
Nb	mg/kg	--	--	<0.05
Ni	mg/kg	20	220	7.3
P	mg/kg	130	--	80
Pb	mg/kg	150	150	5.5
Rb	mg/kg	--	--	42
Re	mg/kg	--	--	0.001
S	mg/kg	--	32000	286
Sb	mg/kg	<0.8	<0.8	<0.6
Sc	mg/kg	--	--	2
Se	mg/kg	6.2	3.1	<0.6
Si	mg/kg	1800	--	--
Sn	mg/kg	<0.5	1.8	<0.4
Sr	mg/kg	22	66	23
Ta	mg/kg	--	--	<0.01
Tb	mg/kg	--	--	--
Te	mg/kg	--	--	0.04
Th	mg/kg	--	--	14
Ti	mg/kg	76	91	<61
Tl	mg/kg	0.2	0.29	0.29
U	mg/kg	1400	29	14
V	mg/kg	66	180	17
W	mg/kg	--	--	0.8
Y	mg/kg	11	19	1.1
Zn	mg/kg	20	86	3.2
Zr	mg/kg	--	--	20

ATTACHMENT A-2

Submerged Column - Concentration Summary

Submerged Column - Concentration Summary

Mass of Water in Column	3895	g
Volume of Water in Column	3.90	L
Initial Mass of Rock in Column	6.80	kg

Parameter		MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW
Day		0	3	10	17	25	31	38	45	52	59	66	73	81	87	95	102	109	116
Week		0.0	0.4	1.4	2.4	3.6	4.4	5.4	6.4	7.4	8.4	9.4	10.4	11.6	12.4	13.6	14.6	15.6	16.6
Volume Water Removed (L)		0.12	0.12	0.12	1.32	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mass of Rock in Column (kg)		6.80392	6.80392	6.80392	6.78191	6.72699	6.70615	6.70230	6.74361	6.75538	6.77145	6.75156	6.75858	6.76029	6.76631	6.74417	6.75584	6.75990	6.76106
Volume Water Added at Sampling (L)																			
	Units																		
pH	---	6.78	7.17	7.08	7.35	7.48	7.38	7.40	7.50	7.41	7.53	7.48	7.21	7.29	7.45	7.36	7.34	7.32	7.29
Conductivity	mS	0.18	0.34	0.37	0.35	0.28	0.23	0.19	0.18	0.16	0.10	0.13	0.11	0.12	0.09	0.10	0.08	0.08	0.08
Aluminum (Al)-Dissolved	mg/L	0.083	0.067	0.095	0.0208	0.0187	0.0286	0.0268	0.0348	0.0285	0.0880	0.0487	0.0808	0.156	0.245	0.253	0.257	0.237	0.170
Antimony (Sb)-Dissolved	mg/L	<0.0005	<0.0005	0.0007	0.00037	0.00036	0.00034	0.00034	0.00036	0.00036	0.00035	0.00036	0.00037	0.00037	0.00037	0.00039	0.00039	0.00036	0.00038
Arsenic (As)-Dissolved	mg/L	0.007	0.01	0.012	0.0127	0.0108	0.00999	0.0104	0.00954	0.00893	0.00873	0.00783	0.00739	0.00653	0.00604	0.00584	0.00543	0.00518	0.00470
Barium (Ba)-Dissolved	mg/L	<0.005	0.01	0.013	0.0140	0.0108	0.00876	0.00796	0.00687	0.00594	0.00539	0.00481	0.00438	0.00420	0.00387	0.00395	0.00360	0.00292	0.00289
Beryllium (Be)-Dissolved	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bismuth (Bi)-Dissolved	mg/L	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron (B)-Dissolved	mg/L	0.26	0.5	0.68	0.768	0.689	0.631	0.585	0.456	0.423	0.422	0.394	0.334	0.324	0.295	0.294	0.260	0.222	0.249
Cadmium (Cd)-Dissolved	mg/L	<0.0001	<0.0001	<0.0001	<0.0002	0.000142	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015	0.000144	<0.0001	<0.00008	<0.00007	<0.00005	<0.00007	<0.00006
Calcium (Ca)-Dissolved	mg/L	12	28	37	41.3	33.6	28.2	25.9	21.4	19.6	18.1	16.2	15.5	13.7	14.8	13.9	12.5	10.1	10.1
Chromium (Cr)-Dissolved	mg/L	<0.005	<0.005	<0.005	<0.0001	0.00018	<0.0001	<0.0001	0.00010	0.00012	0.00016	<0.0002	0.00019	0.00042	0.00038	0.00028	0.00024	0.00029	0.00031
Cobalt (Co)-Dissolved	mg/L	0.0005	0.0009	0.0008	0.00059	0.00035	0.00026	0.00024	0.00017	0.00016	0.00016	<0.0002	0.00011	<0.0001	0.00011	0.00011	<0.0001	<0.0001	<0.0001
Copper (Cu)-Dissolved	mg/L	0.004	0.006	0.004	0.00149	0.00106	0.00112	0.00106	0.00095	0.00087	0.00077	<0.001	0.00064	0.00066	0.00096	0.00055	0.00071	0.00080	0.00080
Iron (Fe)-Dissolved	mg/L	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.030	<0.030	<0.03	<0.06	<0.03	0.022	0.033	0.029	0.015	0.023	0.020
Lead (Pb)-Dissolved	mg/L	<0.0005	0.0007	0.0009	0.000793	0.000578	0.000507	0.000535	0.000376	0.000563	0.000552	0.00045	0.000485	0.000570	0.000577	0.000587	0.000437	0.000423	0.000353
Lithium (Li)-Dissolved	mg/L	0.07	0.12	0.13	0.130	0.106	0.0911	0.0830	0.0689	0.0621	0.0583	0.055	0.0535	0.0518	0.0442	0.0444	0.0426	0.0330	0.0377
Magnesium (Mg)-Dissolved	mg/L	6.5	14	17	17.1	13.9	11.5	10.1	9.01	8.12	7.74	6.08	6.27	5.64	5.27	5.11	4.98	4.41	4.41
Manganese (Mn)-Dissolved	mg/L	0.01	0.024	0.041	0.0419	0.0340	0.0292	0.0252	0.0221	0.0192	0.0191	0.0164	0.0156	0.0141	0.0125	0.0123	0.0112	0.00976	0.00904
Molybdenum (Mo)-Dissolved	mg/L	0.38	0.77	1.1	1.13	1.01	0.886	0.861	0.824	0.746	0.697	0.699	0.601	0.540	0.479	0.461	0.407	0.364	0.347
Nickel (Ni)-Dissolved	mg/L	0.011	0.02	0.025	0.0241	0.0187	0.0145	0.0127	0.0103	0.00735	0.00613	0.0054	0.00431	0.00361	0.00359	0.00277	0.00242	0.00217	0.00216
Phosphorus (P)-Dissolved	mg/L	0.21	0.27	0.21	<0.3	<0.3	<0.3	<0.3	<0.30	<0.30	<0.3	<0.6	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium (K)-Dissolved	mg/L	9.4	14	15	15.6	13.8	12.4	11.2	10.6	10.0	9.61	8.47	8.39	7.75	7.45	7.67	7.22	6.39	6.40
Selenium (Se)-Dissolved	mg/L	0.026	0.043	0.046	0.0463	0.0358	0.0294	0.0245	0.0219	0.0196	0.0167	0.0155	0.0148	0.0133	0.0126	0.0133	0.0126	0.0124	0.0120
Silicon (Si)-Dissolved	mg/L	3.5	6.4	7.3	7.26	6.73	6.53	6.39	5.95	5.77	5.74	5.59	5.49	5.50	5.24	5.41	4.69	4.67	4.82
Silver (Ag)-Dissolved	mg/L	<0.0001	<0.0001	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium (Na)-Dissolved	mg/L	10	17	18	16.7	13.8	11.7	10.3	8.90	8.08	7.75	6.70	6.17	5.63	5.03	4.67	4.66	4.09	3.81
Strontium (Sr)-Dissolved	mg/L	0.14	0.3	0.41	0.417	0.331	0.271	0.244	0.218	0.193	0.172	0.163	0.149	0.139	0.126	0.126	0.114	0.107	0.103
Sulfur (S)-Dissolved	mg/L	16.2	33.4	33.4	36.8	26.8	20.8	16.8	13.2	11.0	9.22	7.75	6.77	5.75	4.95	4.56	4.33	4.04	3.61
Dissolved Tellurium (Te)	mg/L	<0.001	<0.001	<0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium (Tl)-Dissolved	mg/L	<0.00005	0.00005	0.00007	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Thorium (Th)	mg/L	<0.001	<0.001	<0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tin (Sn)-Dissolved	mg/L	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00012	0.00012
Titanium (Ti)-Dissolved	mg/L	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Tungsten (W)	mg/L	0.004	0.006	0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium (U)-Dissolved	mg/L	1.9	12	30	35.2	31.7	26.6	26.3	24.8	22.5	20.6	20.1	18.8	17.1	14.8	14.9	12.9	11.2	10.4
Vanadium (V)-Dissolved	mg/L	0.006	0.006	0.004	0.0030	0.0024	0.0022	0.0021	0.0020	0.0018	0.0019	<0.002	0.0018	0.0020	0.0022	0.0021	0.0018	0.0017	0.0016
Zinc (Zn)-Dissolved	mg/L	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	<0.003	<0.0030	<0.0030	<0.003	<0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Dissolved Zirconium (Zr)	mg/L	<0.001	<0.001	<0.001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulphate (SO4) - Calculated	mg/L	48.6	100.2	100.2	110.4	80.4	62.4	50.4	39.6	33	27.66	23.25	20.31	17.25	14.85	13.68	12.99	12.12	10.83

Submerged Column - Concentration Summary

Mass of Water in Column	3895	g
Volume of Water in Column	3.90	L
Initial Mass of Rock in Column	6.80	kg

Parameter		MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW
Day		123	130	137	146	151	158	165	179	193	210	221	235	252	884	891	898	905	933
Week		17.6	18.6	19.6	20.9	21.6	22.6	23.6	25.6	27.6	30.0	31.6	33.6	36.0	126.3	127.3	128.3	129.3	133.3
Volume Water Removed (L)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.10	0.10	0.10	0.10	0.10
Mass of Rock in Column (kg)		6.76645	6.77054	6.75661	6.76908	6.76921	6.77157	6.77186	6.77308	6.77569	6.77519	6.77552	6.77669	6.78191	6.78191	6.78191	6.78191	6.78132	6.78171
Volume Water Added at Sampling (L)															0.06	0.00	0.04	0.02	0.04
	Units																		
pH	---	7.28	7.30	7.22	7.24	7.28	7.24	7.29	7.11	7.23	7.94	7.81	7.95		7.66	7.66	7.73	7.61	7.64
Conductivity	mS	0.08	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.09	0.08		0.16	0.15	0.15	0.15	0.15
Aluminum (Al)-Dissolved	mg/L	0.0395	0.409	0.152	0.0662	0.124	0.106	0.107	0.111	0.0371	0.0980	0.0279	0.0295	0.0458	0.0599	0.0278	0.0347	0.0155	0.0420
Antimony (Sb)-Dissolved	mg/L	0.00035	0.00038	0.00041	0.00037	0.00038	0.00037	0.00042	0.00040	0.00037	0.00045	0.00044	0.00038	0.00039	<0.0002	0.00023	0.00022	<0.0005	0.00022
Arsenic (As)-Dissolved	mg/L	0.00479	0.00407	0.00439	0.00381	0.00350	0.00344	0.00328	0.00309	0.00293	0.00279	0.00278	0.00277	0.00285	0.00444	0.00482	0.00395	0.0039	0.0038
Barium (Ba)-Dissolved	mg/L	0.00261	0.00281	0.00243	0.00213	0.00211	0.00182	0.00194	0.00197	0.00185	0.00196	0.00182	0.00190	0.00178	0.00439	0.00447	0.00407	0.0042	0.0043
Beryllium (Be)-Dissolved	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002
Bismuth (Bi)-Dissolved	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.0025	<0.001
Boron (B)-Dissolved	mg/L	0.195	0.182	0.215	0.199	0.196	0.178	0.181	0.156	0.166	0.181	0.157	0.167	0.144	0.219	0.239	0.226	0.2530	0.265
Cadmium (Cd)-Dissolved	mg/L	0.000055	0.000047	<0.00005	<0.00005	<0.00007	0.000039	0.000032	<0.00005	0.000076	<0.00006	<0.00006	<0.00007	0.000045	<0.00025	<0.0005	<0.0002	<0.00025	<0.0003
Calcium (Ca)-Dissolved	mg/L	9.84	8.79	8.79	8.09	7.51	7.23	6.54	7.53	6.82	7.98	7.00	6.76	6.70	14.1	15.3	14.8	15.2000	14.7
Chromium (Cr)-Dissolved	mg/L	0.00038	0.00088	0.00057	0.00046	0.00050	0.00051	0.00047	0.00050	0.00033	0.00032	0.00023	0.00014	0.00049	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002
Cobalt (Co)-Dissolved	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002
Copper (Cu)-Dissolved	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00061	<0.0005	0.00065	<0.0005	<0.0005	0.0004	<0.0004	<0.0004	<0.001	<0.0004
Iron (Fe)-Dissolved	mg/L	<0.01	0.068	0.021	<0.01	0.015	<0.01	0.011	0.014	<0.01	0.013	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02
Lead (Pb)-Dissolved	mg/L	0.000174	0.000785	0.000399	0.000266	0.000258	0.000220	0.000405	0.000363	0.000170	0.000436	0.000160	0.000151	0.000275	0.00046	0.00039	0.00058	0.0004	0.0005
Lithium (Li)-Dissolved	mg/L	0.0337	0.0328	0.0335	0.0342	0.0330	0.0320	0.0305	0.0296	0.0284	0.0309	0.0289	0.0286	0.0308	0.0371	0.0377	0.0361	0.0372	0.0393
Magnesium (Mg)-Dissolved	mg/L	4.01	3.50	3.71	3.44	3.27	3.23	2.94	3.06	3.00	3.19	3.03	3.09	3.20	6.02	5.83	6.06	6.0500	5.81
Manganese (Mn)-Dissolved	mg/L	0.00893	0.00751	0.00758	0.00678	0.00642	0.00605	0.00563	0.00581	0.00553	0.00591	0.00568	0.00566	0.00535	0.0318	0.0329	0.0303	0.0300	0.0307
Molybdenum (Mo)-Dissolved	mg/L	0.264	0.272	0.266	0.251	0.226	0.223	0.209	0.232	0.227	0.261	0.244	0.257	0.255	1.29	1.31	1.26	1.29	1.13
Nickel (Ni)-Dissolved	mg/L	0.00175	0.00170	0.00148	0.00122	0.00107	0.00109	0.00098	0.00096	0.00083	0.00087	0.00075	0.00074	0.00075	0.0013	0.0013	0.0012	<0.0025	0.0011
Phosphorus (P)-Dissolved	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.6	<0.6	<0.6	<1.5	<0.6
Potassium (K)-Dissolved	mg/L	6.71	5.74	6.12	5.69	5.71	5.52	5.45	5.20	5.36	5.28	5.33	5.34	5.34	7.16	6.36	6.31	6.3000	6.64
Selenium (Se)-Dissolved	mg/L	0.0115	0.0115	0.0106	0.0107	0.0101	0.00918	0.00984	0.00955	0.00922	0.00832	0.00866	0.00786	0.00796	0.00213	0.00268	0.00228	0.0028	0.00199
Silicon (Si)-Dissolved	mg/L	4.70	4.92	4.73	4.59	4.40	4.50	4.69	4.43	4.15	4.16	4.15	4.17	4.29	4.17	4.01	3.73	3.9300	3.99
Silver (Ag)-Dissolved	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00062	0.000038	0.000286	<0.00005	<0.00002
Sodium (Na)-Dissolved	mg/L	3.77	3.28	3.23	2.80	2.65	2.54	2.35	2.36	2.24	2.37	2.16	2.13	2.03	2.96	2.80	2.84	2.7700	2.7
Strontium (Sr)-Dissolved	mg/L	0.0834	0.0863	0.0865	0.0836	0.0760	0.0732	0.0708	0.0758	0.0726	0.0776	0.0706	0.0721	0.0668	0.164	0.166	0.160	0.1650	0.161
Sulfur (S)-Dissolved	mg/L	3.16	2.93	2.66	2.73	2.39	2.14	1.97	2.14	2.19	2.27	2.09	1.94	1.93	1.02	1.50	1.66	1.98	2.22
Dissolved Tellurium (Te)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium (Tl)-Dissolved	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.000025	0.000033	0.000035	0.000045	<0.00005	0.000037
Dissolved Thorium (Th)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tin (Sn)-Dissolved	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002
Titanium (Ti)-Dissolved	mg/L	<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	<0.02	<0.02	<0.02	<0.05	<0.02
Dissolved Tungsten (W)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium (U)-Dissolved	mg/L	7.81	7.82	7.53	6.84	5.42	5.00	4.40	4.56	3.97	4.48	3.84	3.42	3.01	11.7	16.1	15.3	14.1	13.3
Vanadium (V)-Dissolved	mg/L	0.0013	0.0024	0.0017	0.0013	0.0015	0.0012	0.0014	0.0013	0.0011	0.0014	0.0012	0.0012	0.0012	0.0028	<0.002	<0.002	<0.005	<0.002
Zinc (Zn)-Dissolved	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0023	0.0028	<0.002	<0.005	<0.002
Dissolved Zirconium (Zr)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulphate (SO4) - Calculated	mg/L	9.48	8.79	7.98	8.19	7.17	6.42	5.91	6.42	6.57	6.81	6.27	5.82	5.79	3.06	4.5	4.98	5.94	6.66

Submerged Column - Concentration Summary

Mass of Water in Column	3895	g
Volume of Water in Column	3.90	L
Initial Mass of Rock in Column	6.80	kg

Parameter		MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW
Day		940	947	954	961	968	975	982	989	996	1003	1010	1017	1024	1031	1038	1045
Week		134.3	135.3	136.3	137.3	138.3	139.3	140.3	141.3	142.3	143.3	144.3	145.3	146.3	147.3	148.3	149.3
Volume Water Removed (L)		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Mass of Rock in Column (kg)		6.78171	6.78174	6.78191	6.78146	6.78180	6.78172	6.78184	6.78189	6.78178	6.78191	6.78116	6.78191	6.78152	6.78178	6.78191	6.78191
Volume Water Added at Sampling (L)		0.04	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.07	0.04	0.03	0.03	0.03	0.03	0.03	0.03
	Units																
pH	---	7.71	7.63	7.60	7.95	7.83	7.80	7.89	7.92	7.90	7.71	7.92	7.87	7.91	7.75	7.69	7.04
Conductivity	mS	0.16	0.15	0.15	0.16	0.15	0.16	0.16	0.15	0.13	0.15	0.15	0.15	0.15	0.15	0.16	0.15
Aluminum (Al)-Dissolved	mg/L	0.0141	0.014	0.0103	0.0114	0.0259	0.0193	0.0168	0.0425	0.0446	0.012	0.0197	0.0858	0.0161	0.0225	0.0114	0.0123
Antimony (Sb)-Dissolved	mg/L	<0.0005	0.00024	0.00022	0.00021	0.00021	0.00022	0.0002	0.00022	0.00017	0.00021	0.00023	0.00022	0.00022	<0.0002	0.00021	0.00022
Arsenic (As)-Dissolved	mg/L	0.00352	0.00351	0.00352	0.00336	0.00345	0.0033	0.00294	0.00327	0.00377	0.00318	0.00315	0.00293	0.00317	0.00314	0.00379	0.00363
Barium (Ba)-Dissolved	mg/L	0.00441	0.00456	0.00418	0.00448	0.00422	0.00463	0.00446	0.00442	0.00346	0.00423	0.0044	0.0048	0.00461	0.00422	0.00411	0.00447
Beryllium (Be)-Dissolved	mg/L	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth (Bi)-Dissolved	mg/L	<0.0025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001
Boron (B)-Dissolved	mg/L	0.253	0.228	0.258	0.252	0.218	0.256	0.235	0.237	0.199	0.218	0.246	0.237	0.228	0.234	0.256	0.256
Cadmium (Cd)-Dissolved	mg/L	<0.00025	<0.00025	<0.0003	<0.00022	<0.0003	<0.0003	<0.0003	<0.00022	<0.0002	<0.0003	0.000253	<0.0003	<0.0003	<0.0002	<0.0003	0.000486
Calcium (Ca)-Dissolved	mg/L	15.8	15	14.8	15.3	14	15.2	15.1	15.3	11.5	14.2	15.1	14.7	15	13.2	14.1	14.6
Chromium (Cr)-Dissolved	mg/L	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	0.00025	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	0.00014	<0.0002	<0.0002	<0.0002	<0.0002
Cobalt (Co)-Dissolved	mg/L	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
Copper (Cu)-Dissolved	mg/L	<0.001	0.0007	0.00051	<0.0004	0.00043	0.00073	0.00144	0.00061	0.00076	0.00064	0.00056	0.0008	0.00071	0.00103	<0.0004	0.00123
Iron (Fe)-Dissolved	mg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	0.012	<0.02	<0.02	<0.02	<0.02
Lead (Pb)-Dissolved	mg/L	0.00041	0.00069	0.00042	0.00047	0.00045	0.00102	0.0007	0.00064	0.000432	0.000602	0.000538	0.000703	0.00056	0.00038	0.00046	0.00062
Lithium (Li)-Dissolved	mg/L	0.0387	0.0372	0.0428	0.0404	0.0353	0.0413	0.0414	0.0399	0.0324	0.0379	0.0429	0.0421	0.0406	0.0392	0.0467	0.0418
Magnesium (Mg)-Dissolved	mg/L	6.22	6.09	6.16	5.7	6.4	6.29	6.02	5.92	4.82	5.93	5.9	5.97	6.03	5.87	6.2	6.02
Manganese (Mn)-Dissolved	mg/L	0.0326	0.0315	0.0297	0.0295	0.0304	0.0316	0.0302	0.0315	0.0234	0.0291	0.0301	0.029	0.03	0.0272	0.0274	0.0289
Molybdenum (Mo)-Dissolved	mg/L	1.23	1.09	1.14	1.08	1.03	1.05	1.08	1.03	0.802	0.977	0.964	0.948	0.945	0.835	0.856	0.91
Nickel (Ni)-Dissolved	mg/L	<0.0025	0.0012	0.001	<0.001	0.0011	0.0013	<0.001	0.001	0.00148	0.00132	0.0011	0.00101	0.001	<0.001	<0.001	0.0011
Phosphorus (P)-Dissolved	mg/L	<1.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.3	<0.3	<0.3	<0.3	<0.6	<0.6	<0.6	<0.6
Potassium (K)-Dissolved	mg/L	6.47	6.68	5.97	6.51	6.35	6.92	7.19	7.99	5.37	6.02	6.58	6.52	6.28	6.82	6.47	6.5
Selenium (Se)-Dissolved	mg/L	0.00244	0.00266	0.00285	0.00232	0.00267	0.00222	0.00256	0.00238	0.00196	0.00278	0.00322	0.00284	0.00283	0.0027	0.00274	0.00246
Silicon (Si)-Dissolved	mg/L	3.76	3.76	3.7	3.71	3.59	3.82	3.53	3.58	3.07	3.59	3.81	3.88	3.6	3.63	3.76	3.81
Silver (Ag)-Dissolved	mg/L	<0.00005	0.00002	<0.00002	<0.00002	<0.00002	0.000088	0.00192	0.000074	0.000012	<0.00001	0.000011	0.000012	<0.00002	<0.00002	<0.00002	0.000029
Sodium (Na)-Dissolved	mg/L	2.96	2.87	2.9	2.98	2.92	3.05	2.79	2.69	2.43	2.86	2.8	2.81	2.61	2.67	2.9	2.78
Strontium (Sr)-Dissolved	mg/L	0.168	0.162	0.166	0.17	0.156	0.162	0.159	0.16	0.127	0.158	0.164	0.163	0.163	0.147	0.159	0.159
Sulfur (S)-Dissolved	mg/L	2.67	2.9	2.93	3.16	3.2	3.13	3.16	3.35	2.93	3.62	4.31	4.36	4.22	4.43	4.44	4.32
Dissolved Tellurium (Te)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium (Tl)-Dissolved	mg/L	<0.00005	0.000034	0.000034	0.000041	0.000033	0.000037	0.000034	0.000033	0.000031	0.000035	0.00004	0.000038	0.000041	0.000042	0.000037	0.000039
Dissolved Thorium (Th)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tin (Sn)-Dissolved	mg/L	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
Titanium (Ti)-Dissolved	mg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02
Dissolved Tungsten (W)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium (U)-Dissolved	mg/L	14.2	12.9	12.5	12.5	11.8	11.7	11.5	11.6	8.92	10.5	10.8	9.77	8.94	7.19	8.09	8.25
Vanadium (V)-Dissolved	mg/L	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0013	0.0011	0.0013	0.0015	<0.002	<0.002	<0.002	<0.002
Zinc (Zn)-Dissolved	mg/L	<0.005	<0.002	<0.002	<0.002	<0.002	0.0039	0.0022	0.0021	0.0024	0.0031	0.0019	0.002	<0.002	<0.002	<0.002	0.005
Dissolved Zirconium (Zr)	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulphate (SO4) - Calculated	mg/L	8.01	8.7	8.79	9.48	9.6	9.39	9.48	10.05	8.79	10.86	12.93	13.08	12.66	13.29	13.32	12.96

ATTACHMENT A-3

Submerged Column - Loading Summary

Submerged Column - Loading Summary

Mass of Water in Column	3895	g
Volume of Water in Column	3.90	L
Initial Mass of Rock in Column	6.80	kg

Parameter		MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW
Day		0	3	10	17	25	31	38	45	52	59	66	73	81	87	95	102	109	116	123
Week		0.0	0.4	1.4	2.4	3.6	4.4	5.4	6.4	7.4	8.4	9.4	10.4	11.6	12.4	13.6	14.6	15.6	16.6	17.6
Volume Water Removed (L)		0.12	0.12	0.12	1.32	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mass Removed (g)		0.00	0.00	22.01	54.92	32.50	67.11	14.86	15.31	10.46	30.35	23.33	21.62	15.60	37.74	26.07	22.01	20.85	15.46	11.37
Mass Replenished (g)		0.00	0.00	0.00	0.00	11.66	63.26	56.17	27.08	26.53	10.46	30.35	23.33	21.62	15.60	37.74	26.07	22.01	20.85	15.46
Mass of Rock in Column (kg)		6.80392	6.80392	6.80392	6.78191	6.72699	6.70615	6.70230	6.74361	6.75538	6.77145	6.75156	6.75858	6.76029	6.76631	6.74417	6.75584	6.75990	6.76106	6.76645
Volume Water Added at Sampling (L)																				
	Units																			
pH	---	6.78	7.17	7.08	7.35	7.48	7.38	7.40	7.50	7.41	7.53	7.48	7.21	7.29	7.45	7.36	7.34	7.32	7.29	7.28
Conductivity	mS	0.18	0.34	0.37	0.35	0.28	0.23	0.19	0.18	0.16	0.10	0.13	0.11	0.12	0.09	0.10	0.08	0.08	0.08	0.08
Aluminum (Al)-Dissolved	mg/L	0.083	0.067	0.095	0.0208	0.0187	0.0286	0.0268	0.0348	0.0285	0.0880	0.0487	0.0808	0.156	0.245	0.253	0.257	0.237	0.170	0.0395
Mass Loaded	mg	0.3238574	-0.0524703	0.1172931	-0.2781207	0.019262	0.0573288	0.0215766	0.0580152	0.0102181	0.2606628	-0.0653445	0.1739509	0.3742226	0.5032688	0.2762152	0.2686076	0.1789621	-0.0244271	-0.3391975
Aluminum Loading Rate	mg/kg/wk	0.3331905	-0.0179942	0.017239	-0.0410092	0.0025055	0.0099735	0.0032193	0.008603	0.0015126	0.0384944	-0.0096784	0.0257378	0.0484365	0.0867751	0.0358366	0.0397593	0.0264741	-0.0036129	-0.0501293
Antimony Loading Rate	mg/kg/wk	0.0020072	2.058E-05	0.0001235	-0.0001775	5.845E-05	4.905E-05	5.073E-05	6.199E-05	5.329E-05	4.74E-05	5.762E-05	5.904E-05	4.789E-05	6.38E-05	5.813E-05	5.773E-05	4.038E-05	6.479E-05	3.886E-05
Arsenic Loading Rate	mg/kg/wk	0.0281004	0.0043024	0.0013233	0.0006151	0.0012162	0.001329	0.0017292	0.0010446	0.0010599	0.0012035	0.0007729	0.0009045	0.0005222	0.0007963	0.0006824	0.0006276	0.000659	0.0004891	0.0007465
Barium Loading Rate	mg/kg/wk	0.0200717	0.0068963	0.0018968	0.0008054	0.0007796	0.0004941	0.0008413	0.0005497	0.0004798	0.0005603	0.0004631	0.0004634	0.000476	0.0005022	0.0005426	0.0003825	0.00014	0.0004146	0.0002656
Beryllium Loading Rate	mg/kg/wk	0.0020072	2.058E-05	8.818E-06	8.847E-06	8.585E-05	8.698E-05	7.46E-05	7.414E-05	7.402E-05	7.384E-05	0.000363	-0.0001407	6.472E-05	8.621E-05	6.487E-05	7.401E-05	7.397E-05	7.395E-05	7.389E-05
Bismuth Loading Rate	mg/kg/wk	0.0040143	4.115E-05	1.764E-05	-0.00027	8.585E-05	8.698E-05	7.46E-05	7.414E-05	7.402E-05	7.384E-05	0.000363	-0.0001407	6.472E-05	8.621E-05	6.487E-05	7.401E-05	7.397E-05	7.395E-05	7.389E-05
Boron Loading Rate	mg/kg/wk	1.0	0.3318472	0.1120444	0.0626618	0.0917679	0.080494	0.0673668	0.0121086	0.048441	0.0618919	0.0463222	0.0236568	0.0381801	0.0363545	0.0377676	0.0238809	0.016528	0.0484171	0.0056599
Cadmium Loading Rate	mg/kg/wk	0.0004014	4.115E-06	1.764E-06	5.93E-05	4.902E-06	3.013E-05	2.238E-05	2.224E-05	2.22E-05	2.215E-05	2.222E-05	1.873E-05	-3.583E-06	3.787E-06	5.317E-06	-1.19E-06	1.894E-05	4.582E-06	5.984E-06
Calcium Loading Rate	mg/kg/wk	48	22	5.7	3.1	3.2	2.2	2.9	1.2	2.1	2.0	1.6	2.0	1.1	3.1	1.5	1.2	0.4638306	1.5	1.3
Chromium Loading Rate	mg/kg/wk	0.0200717	0.0002058	8.818E-05	-0.0027307	5.777E-05	-2.299E-05	1.492E-05	1.483E-05	2.635E-05	4.077E-05	4.682E-05	2.382E-05	0.0001407	4.551E-05	-1.322E-06	1.834E-05	6.436E-05	5.443E-05	8.618E-05
Cobalt Loading Rate	mg/kg/wk	0.0020072	0.0005558	-4.147E-05	-0.0001067	-2.051E-05	-2.037E-07	2.715E-05	-4.913E-06	1.939E-05	2.363E-05	4.682E-05	-2.237E-05	9.187E-06	2.397E-05	1.427E-05	1.051E-05	1.479E-05	1.479E-05	1.478E-05
Copper Loading Rate	mg/kg/wk	0.0160574	0.0028408	-0.0010411	-0.0013733	3.759E-05	0.0002251	0.0001322	9.354E-05	9.442E-05	7.086E-05	0.000247	-5.988E-05	9.294E-05	0.0003156	-8.301E-05	0.0001738	0.000157	0.0001183	-5.477E-05
Iron (Fe)-Dissolved	mg/L	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.030	<0.030	<0.03	<0.06	<0.03	0.022	0.033	0.029	0.015	0.023	0.020	<0.01
Mass Loaded	mg	0.3901896	0.012	0.012	-0.2611327	0.0396	0.03	0.03	0.03	0.03	0.03	0.1470569	-0.0570569	-0.0012152	0.0649209	0.0173924	-0.0256265	0.0462152	0.0112943	-0.019019
Iron Loading Rate	mg/kg/wk	0.4014344	0.0041153	0.0017637	-0.0385043	0.0051509	0.0052191	0.0044761	0.0044487	0.0044409	0.0044304	0.0217812	-0.0084421	-0.0001573	0.0111938	0.0022565	-0.0037932	0.0068367	0.0016705	-0.0028108
Lead Loading Rate	mg/kg/wk	0.0020072	0.0002882	0.000127	-4.564E-05	2.704E-05	5.236E-05	9.195E-05	-1.266E-05	0.0001637	7.68E-05	2.281E-05	8.679E-05	0.0001057	0.000103	7.992E-05	2.539E-07	5.656E-05	2.217E-05	-5.105E-05
Lithium Loading Rate	mg/kg/wk	0.2810041	0.0697864	0.0078512	0.0023002	0.0101398	0.0083265	0.0088767	0.0041496	0.0062716	0.0069812	0.0067279	0.0072718	0.0060661	0.0038184	0.0058358	0.0055325	0.0007606	0.0075933	0.003265
Magnesium Loading Rate	mg/kg/wk	26	10	2.0	0.3583341	1.3	0.7890305	0.9007871	0.8670331	0.8196892	1.0	0.187046	1.0	0.4933708	0.7235379	0.6027405	0.6813	0.4076864	0.6522646	0.4210836
Manganese Loading Rate	mg/kg/wk	0.0401434	0.0191451	0.0101724	0.0012433	0.0031846	0.0026567	0.002028	0.0019432	0.0015964	0.0027778	0.0012686	0.0019647	0.0012616	0.0013547	0.0015205	0.0011853	0.0008256	0.001028	0.0012726
Molybdenum Loading Rate	mg/kg/wk	1.5	0.5375027	0.202828	0.0367237	0.1331132	0.0915367	0.1176391	0.106268	0.0769242	0.0819333	0.1043913	0.0468463	0.0469819	0.052069	0.053034	0.0370491	0.0353879	0.0440268	0.0034202
Nickel Loading Rate	mg/kg/wk	0.0441578	0.0124957	0.0032201	-7.545E-05	0.0013972	0.0004022	0.0011155	0.0004946	-0.0001792	0.0003824	0.0004861	0.0001697	0.0002043	0.000609	5.066E-05	0.0002079	0.0002137	0.0003152	8.279E-05
Phosphorus Loading Rate	mg/kg/wk	0.8430122	0.088929	-0.0296467	0.0554963	0.0515089	0.0521909	0.0447608	0.0444866	0.044409	0.0443037	0.2178117	-0.0844214	0.0388297	0.0517269	0.0389225	0.044406	0.0443794	0.0443717	0.0443364
Potassium Loading Rate	mg/kg/wk	38	6.5	0.8203942	0.6106153	1.8	1.5	1.2	1.3	1.2	1.3	0.7645401	1.2	0.762717	1.1	1.1	0.8754125	0.5889771	1.0	1.1
Selenium Loading Rate	mg/kg/wk	0.1043729	0.0238179	0.0024788	0.0009865	0.0026205	0.0018837	0.0015339	0.0021287	0.0019134	0.0012234	0.00178	0.0018893	0.0011581	0.0018223	0.0019891	0.0015644	0.0017485	0.0016032	0.0014851
Silicon Loading Rate	mg/kg/wk	14	4.0	0.629006	0.1061536	1.0	1.0	0.8927882	0.6929768	0.7768118	0.8348202	0.7634851	0.7693643	0.7156337	0.773404	0.765907	0.3849462	0.682253	0.7772871	0.6431397
Silver Loading Rate	mg/kg/wk	0.0004014	4.115E-06	1.764E-06	-5.001E-05	1.717E-06	1.74E-06	1.492E-06	1.483E-06	1.48E-06	1.477E-06	7.26E-06	-2.814E-06	1.294E-06	1.724E-06	1.297E-06	1.48E-06	1.479E-06	1.479E-06	1.478E-06
Sodium Loading Rate	mg/kg/wk	40	10	0.8733049	-0.4294462	1.4	1.0	0.9306276	0.7173228	0.8438378	1.0	0.5410614	0.6853503	0.5258804	0.5670751	0.4703548	0.6854782	0.3603484	0.4433431	0.5400061
Strontium Loading Rate	mg/kg/wk	0.5620081	0.2198597	0.0683736	0.011282	0.0279497	0.0168553	0.0247152	0.0211386	0.0178306	0.0164012	0.0202743	0.0160349	0.0142351	0.0152207	0.0163475	0.0117198	0.0128237	0.0135175	0.0039198
Sulphur Loading Rate	mg/kg/wk	65	24	0.5890722	2.5	1.2	0.5895174	0.7747213	0.408264	0.6832818	0.5987823	0.5160603	0.5809122	0.3611247	0.4532106	0.4447883	0.542133	0.4731505	0.3493808	0.2740206
Tellurium Loading Rate	mg/kg/wk	0.0040143	4.115E-05	1.764E-05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium Loading Rate	mg/kg/wk	0.0002007	2.058E-06	1.235E-05	1.85E-05	1.717E-06	1.74E-05	1.492E-05	1.483E-05	1.48E-05	1.477E-05	7.26E-05	-2.814E-05	1.294E-05	1.724E-05	1.297E-05	1.48E-05	1.479E-05	1.479E-05	1.478E-05
Thorium Loading Rate	mg/kg/wk	0.0040143	4.115E-05	1.764E-05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tin Loading Rate	mg/kg/wk	0.0040143	4.115E-05	1.764E-05	-0.0005001	1.717E-05	1.74E-05	1.492E-05	1.483E-05	1.48E-05	1.477E-05	7.26E-05	-2.814E-05	1.294E-05	1.724E-05	1.297E-05	1.48E-05	2.634E-05	1.775E-05	6.201E-06
Titanium Loading Rate	mg/kg/wk	0.0200717	0.0002058	8.818E-05	0.0029652	0.001717	0.0017397	0.001492	0.0014829	0.0014803	0.0014768	0.0072604	-0.002814	0.0012943	0.0017242	0.0012974	0.0014802	0.0014793	0.0014791	0.0014779
Tungsten Loading Rate	mg/kg/wk	0.0160574	0.0028408	-0.0004677	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Uranium Loading Rate	mg/kg/wk	7.6	14	11	3.5	4.3	2.1	3.8	3.0	2.3	2.2	2.8	2.2	1.6	1.4	2.0	1.1	0.9270516	1.2	0.0434627
Vanadium Loading Rate	mg/kg/wk	0.0240861	0.0002469	-0.0010411	-0.0005046	0.0002106	0.0002818	0.00027	0.0002535	0.0001805	0.0003234	0.0003392	0.0001805	0.000334	0.0004794	0.0002348	0.0001376	0.0002086	0.0001937	6.346E-05
Zinc Loading Rate	mg/kg/wk	0.0200717	0.0002058	8.818E-05	-0.0010622	0.0005151	0.0005219	0.0004476	0.0004449	0.0004441	0.000443	0.0021781	-0.0008442	0.0003883	0.0005173	0.0003892	0.0004441	0.0004438	0.0004437	0.0004434
Zirconium Loading Rate	mg/kg/wk	0.0040143	4.115E-05	1.764E-05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sulphate (SO4) Loading Rate	mg/kg/wk	195	71	1.8	7.6	3.7	1.8	2.3	1.2	2.0	1.8	1.5	1.7	1.1	1.4	1.3	1.6	1.4	1.0	0.8220618

Submerged Column - Loading Summary

Mass of Water in Column	3895	g
Volume of Water in Column	3.90	L
Initial Mass of Rock in Column	6.80	kg

Parameter		MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW
Day		130	137	146	151	158	165	179	193	210	221	235	252	884	891	898	905	933	940
Week		18.6	19.6	20.9	21.6	22.6	23.6	25.6	27.6	30.0	31.6	33.6	36.0	126.3	127.3	128.3	129.3	133.3	134.3
Volume Water Removed (L)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Mass Removed (g)		25.30	12.83	12.70	10.34	10.05	8.83	6.22	6.72	6.39	5.22					0.59	0.20	0.20	0.17
Mass Replenished (g)		11.37	25.30	12.83	12.70	10.34	10.05	8.83	6.22	6.72	6.39	5.22	0.00				0.59	0.20	0.20
Mass of Rock in Column (kg)		6.77054	6.75661	6.76908	6.76921	6.77157	6.77186	6.77308	6.77569	6.77519	6.77552	6.77669	6.78191	6.78191	6.78191	6.78191	6.78132	6.78171	6.78171
Volume Water Added at Sampling (L)														0.06	0.00	0.04	0.02	0.04	0.04
	Units																		
pH	---	7.30	7.22	7.24	7.28	7.24	7.29	7.11	7.23	7.94	7.81	7.95		7.66	7.66	7.73	7.61	7.64	7.71
Conductivity	mS	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.09	0.08		0.16	0.15	0.15	0.15	0.15	0.16
Aluminum (Al)-Dissolved	mg/L	0.409	0.152	0.0662	0.124	0.106	0.107	0.111	0.0371	0.0980	0.0279	0.0295	0.0458	0.0599	0.0278	0.0347	0.0155	0.0420	0.0141
Mass Loaded	mg	1.5	-0.5937874	-0.1827827	0.2917296	0.0537659	0.1099019	0.1226076	-0.1773501	0.2747255	-0.1755229	0.034143	0.0931009	0.0972227	-0.1156669	0.0284886	-0.0705574	0.1036798	-0.1035604
Aluminum Loading Rate	mg/kg/wk	0.2187788	-0.0878824	-0.021002	0.0603352	0.0079399	0.0162292	0.0090511	-0.0130872	0.0166965	-0.0164853	0.0025192	0.0056526	0.0001588	-0.0170552	0.0042007	-0.0104047	0.003822	-0.0152705
Antimony Loading Rate	mg/kg/wk	6.898E-05	7.357E-05	2.918E-05	8.459E-05	5.035E-05	8.345E-05	2.524E-05	2.088E-05	4.146E-05	3.86E-05	1.519E-05	2.544E-05	-5.738E-07	2.198E-05	-2.362E-06	0.0001655	-3.804E-05	0.0001656
Arsenic Loading Rate	mg/kg/wk	0.0002925	0.0007872	0.0002444	0.0005378	0.0004823	0.0004158	0.0001874	0.000182	0.0001449	0.0002584	0.0002022	0.0001871	1.479E-05	0.0003234	-0.0004295	6.137E-05	2.246E-07	-8.377E-05
Barium Loading Rate	mg/kg/wk	0.0005008	0.0001964	0.0001447	0.0004244	0.0001445	0.0003379	0.0001519	0.0001108	0.0001385	0.0001328	0.0001573	8.693E-05	1.954E-05	0.0001496	-0.0001642	0.0001616	3.172E-05	0.0001508
Beryllium Loading Rate	mg/kg/wk	7.385E-05	7.4E-05	5.745E-05	0.0001034	7.384E-05	7.383E-05	3.691E-05	3.69E-05	3.039E-05	4.696E-05	3.689E-05	-6.44E-05	8.006E-07	4.718E-06	2.949E-06	0.0001766	-4.092E-05	0.0001767
Bismuth Loading Rate	mg/kg/wk	7.385E-05	7.4E-05	5.745E-05	0.0001034	7.384E-05	7.383E-05	3.691E-05	3.69E-05	3.039E-05	4.696E-05	3.689E-05	3.036E-05	4.003E-06	2.359E-05	1.475E-05	0.000883	-0.0002046	0.0008834
Boron Loading Rate	mg/kg/wk	0.0213093	0.0459939	0.0175305	0.038736	0.0185726	0.0280138	0.0061606	0.0143911	0.0136458	0.0082044	0.0144627	0.0046906	0.0007131	0.0166735	-0.0039553	0.0200346	0.0028546	-0.0015118
Cadmium Loading Rate	mg/kg/wk	3.513E-06	8.689E-06	5.745E-06	2.648E-05	-7.525E-06	1.726E-06	7.547E-06	1.118E-05	8.247E-07	5.635E-06	7.306E-06	-1.673E-06	1.38E-06	0.0001497	-0.0001652	3.275E-05	8.307E-06	-2.266E-05
Calcium Loading Rate	mg/kg/wk	0.848235	1.3	0.6961509	1.2	0.9477077	0.6700805	0.7679577	0.3512302	0.6895695	0.390349	0.4473825	0.3962202	0.0580981	1.0	-0.0620693	0.5247885	-0.0041195	0.9320195
Chromium Loading Rate	mg/kg/wk	0.0003443	-4.878E-05	1.618E-05	0.0001274	7.96E-05	5.226E-05	4.334E-05	-1.205E-05	1.768E-05	-2.928E-06	-8.94E-06	9.142E-05	-1.048E-06	4.718E-06	2.949E-06	0.0001766	-4.092E-05	0.0001767
Cobalt Loading Rate	mg/kg/wk	1.477E-05	1.48E-05	1.149E-05	2.068E-05	1.477E-05	1.477E-05	7.382E-06	7.379E-06	6.078E-06	9.392E-06	7.378E-06	6.072E-06	8.006E-07	4.718E-06	2.949E-06	0.0001766	-4.092E-05	0.0001767
Copper Loading Rate	mg/kg/wk	7.385E-05	7.4E-05	5.745E-05	0.0001034	7.384E-05	7.383E-05	3.691E-05	6.857E-05	1.099E-05	0.0001019	4.775E-06	3.036E-05	3.068E-07	-1.598E-06	5.898E-06	0.0003532	-8.184E-05	0.0003534
Iron (Fe)-Dissolved	mg/L	0.068	0.021	<0.01	0.015	<0.01	0.011	0.014	<0.01	0.013	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
Mass Loaded	mg	0.23631	-0.1153891	-0.0219209	0.0295095	-0.0045095	0.0139019	0.0227057	-0.0016076	0.0217057	0.0012943	0.01	0.01	0.049019	0.0032	0.002	0.1197569	-0.1110069	0.1198169
Iron Loading Rate	mg/kg/wk	0.0349027	-0.017078	-0.0025187	0.0061031	-0.0006659	0.0020529	0.0016762	-0.0001186	0.0013192	0.0001216	0.0007378	0.0006072	8.006E-05	0.0004718	0.0002949	0.0176598	-0.0040921	0.0176677
Lead Loading Rate	mg/kg/wk	0.0003778	-0.0001067	-1.378E-05	4.856E-05	1.62E-05	0.0001391	1.78E-05	-2.878E-05	7.341E-05	-6.02E-05	9.214E-06	3.854E-05	1.628E-06	-2.942E-05	0.0001151	-8.627E-05	1.477E-05	-4.161E-05
Lithium Loading Rate	mg/kg/wk	0.0044588	0.0052588	0.004163	0.0061048	0.0042971	0.0038611	0.0019923	0.0018388	0.0023189	0.0021692	0.0020459	0.0022576	9.045E-05	0.0012205	-0.0003647	0.0013516	0.000468	0.0004545
Magnesium Loading Rate	mg/kg/wk	0.2983562	0.6392848	0.3052346	0.5742692	0.4598526	0.3098779	0.251601	0.2085313	0.2273826	0.2409728	0.2408339	0.2136693	0.0231964	0.0327105	0.2182919	0.1148863	-0.0075352	0.3541227
Manganese Loading Rate	mg/kg/wk	0.0005006	0.0011519	0.0005123	0.0011117	0.0007349	0.0006514	0.0004675	0.0003481	0.0004262	0.0004708	0.0004133	0.0002702	0.0001773	0.0013831	-0.0010108	0.0004306	0.0002345	0.0017179
Molybdenum Loading Rate	mg/kg/wk	0.0436029	0.0367919	0.0238388	0.0317369	0.0316462	0.0248637	0.0220537	0.0156804	0.0218587	0.0182834	0.0217455	0.01513	0.0070119	0.0419407	-0.0094509	0.0423453	-0.0172602	0.0805298
Nickel Loading Rate	mg/kg/wk	0.0002297	0.0001246	5.349E-05	0.0001313	0.0001695	9.758E-05	6.658E-05	3.341E-05	5.993E-05	3.773E-05	5.246E-05	4.73E-05	4.73E-06	3.067E-05	-3.837E-05	0.0007719	-0.0001902	0.0008279
Phosphorus Loading Rate	mg/kg/wk	0.0443096	0.044401	0.0344705	0.0620456	0.0443029	0.044301	0.0221465	0.022138	0.0182326	0.0281763	0.0221347	0.0182145	0.0024017	0.0141553	0.0088471	0.5297946	-0.1227643	0.5300296
Potassium Loading Rate	mg/kg/wk	0.4320424	1.1	0.5104139	1.2	0.73375	0.7748044	0.3303169	0.4297941	0.3067849	0.5142264	0.3961387	0.3242189	0.0203189	-0.2913511	0.0650119	0.1198632	0.0770066	0.0373059
Selenium Loading Rate	mg/kg/wk	0.0016985	0.0011823	0.0012628	0.0017288	0.0009614	0.0017359	0.0006429	0.0006097	0.0003469	0.000906	0.0004086	0.0005009	-2.415E-05	0.0003667	-0.0001906	0.0003158	-9.705E-05	0.0002994
Silicon Loading Rate	mg/kg/wk	0.820971	0.6184521	0.4807176	0.7959711	0.7073972	0.7739912	0.271332	0.2462826	0.2545892	0.3870467	0.3119545	0.2816107	0.0062416	0.0063251	-0.101967	0.1893332	0.0261602	-0.0511399
Silver Loading Rate	mg/kg/wk	1.477E-06	1.48E-06	1.149E-06	2.068E-06	1.477E-06	1.477E-06	7.382E-07	7.379E-07	6.078E-07	9.392E-07	7.378E-07	6.072E-07	3.878E-06	-0.000318	0.0001432	-0.0001301	-4.092E-06	1.767E-05
Sodium Loading Rate	mg/kg/wk	0.2744347	0.4565759	0.1783484	0.4580448	0.3279581	0.265605	0.1763613	0.1396	0.1669649	0.1456341	0.1507331	0.1056329	0.0092417	-0.0222214	0.0642999	0.0162604	0.0022869	0.2045344
Strontium Loading Rate	mg/kg/wk	0.0139894	0.0128882	0.0086388	0.011157	0.00961	0.0094266	0.0066668	0.0046721	0.005598	0.004723	0.0056409	0.003122	0.0007285	0.0050198	-0.0010043	0.0060622	0.0001606	0.0073037
Sulphur Loading Rate	mg/kg/wk	0.3341778	0.2777263	0.3370215	0.2902403	0.2088919	0.2180609	0.1943962	0.1723142	0.1520692	0.1472361	0.1110214	0.1154184	-0.0026469	0.3002267	0.1141719	0.2171711	0.0433532	0.3040846
Tellurium Loading Rate	mg/kg/wk	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium Loading Rate	mg/kg/wk	1.477E-05	1.48E-05	1.149E-05	2.068E-05	1.477E-05	1.477E-05	7.382E-06	7.379E-06	6.078E-06	9.392E-06	7.378E-06	-1.17E-05	9.181E-08	1.929E-06	6.269E-06	3.773E-06	-1.647E-06	8.233E-06
Thorium Loading Rate	mg/kg/wk	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tin Loading Rate	mg/kg/wk	1.477E-05	1.48E-05	1.149E-05	2.068E-05	1.477E-05	1.477E-05	7.382E-06	7.379E-06	6.078E-06	9.392E-06	7.378E-06	6.072E-06	8.006E-07	4.718E-06	2.949E-06	0.0001766	-4.092E-05	0.0001767
Titanium Loading Rate	mg/kg/wk	0.001477	0.00148	0.001149	0.0020682	0.0014768	0.0014767	0.0007382	0.0007379	0.0006078	0.0009392	0.0007378	0.0006072	8.006E-05	0.0004718	0.0002949	0.0176598	-0.0040921	0.0176677
Tungsten Loading Rate	mg/kg/wk	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Uranium Loading Rate	mg/kg/wk	1.2	1.0	0.5558582	0.2687212	0.5583939	0.392634	0.3709024	0.1666163	0.3622192	0.1862253	0.1624099	0.1105151	0.0602922	2.8	-0.2228748	-0.38588	-0.0521777	0.7884599
Vanadium Loading Rate	mg/kg/wk	0.0008259	-4.904E-05	1.6E-05	0.0004303	4.865E-05	0.0002924	7.455E-05	3.834E-05	0.000138	5.82E-05	8.854E-05	7.286E-05	1.216E-05	-0.0003942	2.949E-05	0.001766	-0.0004092	0.0017668
Zinc Loading Rate	mg/kg/wk	0.0004431	0.000444	0.0003447	0.0006205	0.000443	0.000443	0.0002215	0.0002214	0.0001823	0.0002818	0.0002213	0.0001821	4.388E-07	0.0003419	-0.000419	0.001766	-0.0004092	0.0017668
Zirconium Loading Rate	mg/kg/wk	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sulphate (SO4) Loading Rate	mg/kg/wk	1.0	0.8331788	1.0	0.8707208	0.6266756	0.6541826	0.5831887	0.5169425	0.4562076	0.4417082	0.3330643	0.3462551	-0.0079407	0.90068	0.3425156	0.6515133	0.1300596	0.9122537

Submerged Column - Loading Summary

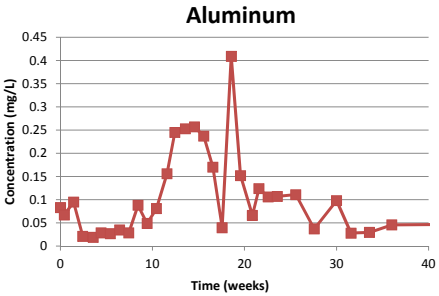
Mass of Water in Column	3895	g
Volume of Water in Column	3.90	L
Initial Mass of Rock in Column	6.80	kg

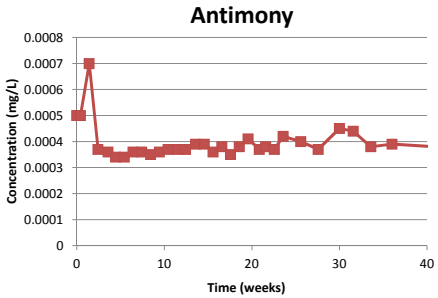
Parameter		MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW	MZ-SW
Day		947	954	961	968	975	982	989	996	1003	1010	1017	1024	1031	1038	1045
Week		135.3	136.3	137.3	138.3	139.3	140.3	141.3	142.3	143.3	144.3	145.3	146.3	147.3	148.3	149.3
Volume Water Removed (L)		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Mass Removed (g)			0.45	0.11	0.19	0.07	0.02	0.13	0.00	0.75		0.39	0.13	0.00		0.28
Mass Replenished (g)		0.17	0.00	0.45	0.11	0.19	0.07	0.02	0.13	0.00	0.75	0.00	0.39	0.13	0.00	0.00
Mass of Rock in Column (kg)		6.78174	6.78191	6.78146	6.78180	6.78172	6.78184	6.78189	6.78178	6.78191	6.78116	6.78191	6.78152	6.78178	6.78191	6.78191
Volume Water Added at Sampling (L)		0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.07	0.04	0.03	0.03	0.03	0.03	0.03	0.03
	Units															
pH	---	7.63	7.60	7.95	7.83	7.80	7.89	7.92	7.90	7.71	7.92	7.87	7.91	7.75	7.69	7.04
Conductivity	mS	0.15	0.15	0.16	0.15	0.16	0.16	0.15	0.13	0.15	0.15	0.15	0.15	0.15	0.16	0.15
Aluminum (Al)-Dissolved	mg/L	0.014	0.0103	0.0114	0.0259	0.0193	0.0168	0.0425	0.0446	0.012	0.0197	0.0858	0.0161	0.0225	0.0114	0.0123
Mass Loaded	mg	0.0012473	-0.0130594	0.0053711	0.0574648	-0.0231722	-0.0076589	0.1016147	0.010002	-0.1200758	0.031149	0.2582919	-0.2617685	0.0264384	-0.0407166	0.0046256
Aluminum Loading Rate	mg/kg/wk	0.0001839	-0.0019256	0.000792	0.0084734	-0.0034169	-0.0011293	0.0149832	0.0014748	-0.0177053	0.0045935	0.0380854	-0.0386003	0.0038985	-0.0060037	0.0006821
Antimony Loading Rate	mg/kg/wk	-0.0001396	-7.296E-06	-1.601E-06	3.747E-06	9.438E-06	-7.42E-06	1.505E-05	-2.676E-05	2.61E-05	1.483E-05	-2.223E-06	2.985E-06	-8.077E-06	8.689E-06	8.807E-06
Arsenic Loading Rate	mg/kg/wk	6.432E-05	6.734E-05	-2.562E-05	0.0001117	-2.577E-05	-0.0001458	0.0002419	0.0003047	-0.0002628	3.445E-05	-7.792E-05	0.0001767	3.102E-05	0.000418	-3.549E-05
Barium Loading Rate	mg/kg/wk	0.0001741	-0.0001386	0.0002515	-6.966E-05	0.0003099	-1.179E-05	5.59E-05	-0.0005124	0.000506	0.0001657	0.0002955	-4.328E-05	-0.0001526	2.97E-08	0.0002662
Beryllium Loading Rate	mg/kg/wk	-0.0001627	3.509E-06	3.775E-06	3.568E-06	3.509E-06	3.716E-06	3.539E-06	-5.515E-05	1.946E-06	1.622E-06	1.519E-06	5.841E-05	3.038E-06	2.979E-06	2.949E-06
Bismuth Loading Rate	mg/kg/wk	-0.0008133	1.755E-05	1.887E-05	1.784E-05	1.755E-05	1.858E-05	1.769E-05	-0.0002757	9.732E-06	8.111E-06	7.594E-06	0.000292	1.519E-05	1.489E-05	1.475E-05
Boron Loading Rate	mg/kg/wk	-0.0093475	0.0212608	0.0014175	-0.0150657	0.0256888	-0.007326	0.0053088	-0.0198635	0.0146982	0.0195319	-0.0014088	-0.0019193	0.0068884	0.0160482	0.0037747
Cadmium Loading Rate	mg/kg/wk	4.977E-06	3.315E-05	-4.037E-05	4.995E-05	5.264E-06	5.574E-06	-4.072E-05	-9.808E-06	6.087E-05	-2.198E-05	3.071E-05	4.07E-06	-5.254E-05	6.008E-05	0.0001106
Calcium Loading Rate	mg/kg/wk	-0.1457616	0.1481324	0.5670384	-0.474972	0.9360864	0.2248668	0.3822503	-2.0	1.8	0.7444901	0.0006696	0.3705761	-0.799851	0.7105383	0.4934374
Chromium Loading Rate	mg/kg/wk	-0.0001627	3.509E-06	3.775E-06	3.568E-06	3.228E-05	-2.412E-05	3.539E-06	-5.515E-05	1.946E-06	1.622E-06	2.438E-05	3.613E-05	3.038E-06	2.979E-06	2.949E-06
Cobalt Loading Rate	mg/kg/wk	-0.0001627	3.509E-06	3.775E-06	3.568E-06	3.509E-06	3.716E-06	3.539E-06	-5.515E-05	1.946E-06	1.622E-06	1.519E-06	5.841E-05	3.038E-06	2.979E-06	2.949E-06
Copper Loading Rate	mg/kg/wk	-0.0001527	-9.703E-05	-5.367E-05	2.44E-05	0.0001802	0.0004221	-0.0004521	8.889E-05	-5.358E-05	-3.532E-05	0.0001457	-4.049E-05	0.0001935	-0.0003444	0.0004799
Iron (Fe)-Dissolved	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.01	<0.01	<0.01	0.012	<0.02	<0.02	<0.02	<0.02
Mass Loaded	mg	-0.1103069	0.00238	0.00256	0.00242	0.00238	0.00252	0.0024	-0.037399	0.00132	0.0011	0.0087838	0.0320552	0.00206	0.00202	0.002
Iron Loading Rate	mg/kg/wk	-0.0162653	0.0003509	0.0003775	0.0003568	0.0003509	0.0003716	0.0003539	-0.0055146	0.0001946	0.0001622	0.0012952	0.0047268	0.0003038	0.0002979	0.0002949
Lead Loading Rate	mg/kg/wk	0.0001693	-0.0001432	3.67E-05	-3.121E-06	0.0003358	-0.0001652	-2.213E-05	-0.0001132	0.0001053	-2.68E-05	0.0001025	-7.205E-05	-9.426E-05	5.134E-05	9.815E-05
Lithium Loading Rate	mg/kg/wk	-9.265E-05	0.0038746	-0.0005731	-0.0022135	0.0040715	0.0008248	-0.0001305	-0.0039671	0.0037642	0.0034712	0.0001942	-0.0002846	-0.0001827	0.0048668	-0.0021096
Magnesium Loading Rate	mg/kg/wk	0.0490219	0.147133	-0.1484035	0.5044424	0.0490128	-0.038481	0.0489849	-0.5813763	0.7262209	0.0790548	0.1296217	0.115221	0.0002339	0.27587	-0.0113716
Manganese Loading Rate	mg/kg/wk	1.606E-05	-0.0004829	0.0004455	0.0010441	0.0012239	-0.0002184	0.0012823	-0.0043631	0.0037029	0.0010433	-0.0001717	0.0009639	-0.001143	0.0005193	0.0012606
Molybdenum Loading Rate	mg/kg/wk	-0.0560646	0.0478928	-0.0130051	-0.0094982	0.0295807	0.0367683	-0.0096573	-0.12184	0.1153135	0.0084218	0.0054943	0.0111493	-0.0484495	0.0244276	0.0434592
Nickel Loading Rate	mg/kg/wk	-0.0006982	-9.401E-05	1.887E-05	7.538E-05	0.0001344	-0.0001485	1.769E-05	0.000278	-6.235E-05	-0.0001043	-3.474E-05	7.997E-06	1.519E-05	1.489E-05	7.185E-05
Phosphorus Loading Rate	mg/kg/wk	-0.4879584	0.010528	0.011325	0.0107051	0.0105283	0.0111474	0.0106165	-0.1654387	0.0058391	0.0048664	0.0045562	0.1752216	0.0091127	0.0089355	0.0088471
Potassium Loading Rate	mg/kg/wk	0.2496186	-0.2912788	0.4233873	0.0240949	0.4393769	0.28391	0.5874936	-1.4	0.4748474	0.417566	0.0656343	-0.0484692	0.4036793	-0.0983047	0.1125327
Selenium Loading Rate	mg/kg/wk	0.0001751	0.000156	-0.0002512	0.0002428	-0.0002121	0.0002369	-5.826E-05	-0.0002212	0.0005053	0.0002965	-0.0001683	3.282E-05	-3.124E-05	6.305E-05	-0.0001195
Silicon Loading Rate	mg/kg/wk	0.074848	0.0314552	0.0755912	-0.0028484	0.195326	-0.0958781	0.0912275	-0.2638816	0.3560157	0.183915	0.0978799	-0.1071045	0.0718037	0.1282982	0.0839947
Silver Loading Rate	mg/kg/wk	-1.627E-05	3.509E-07	3.775E-07	3.568E-07	3.948E-05	0.0010557	-0.0010281	-3.453E-05	-9.059E-07	7.335E-07	7.387E-07	4.727E-06	3.038E-07	2.979E-07	5.434E-06
Sodium Loading Rate	mg/kg/wk	0.0071411	0.0676191	0.1007676	0.0186479	0.1260339	-0.0929236	-0.0081673	-0.1286614	0.2922828	0.0121168	0.0482414	-0.0759799	0.0738956	0.1711076	-0.0257667
Strontium Loading Rate	mg/kg/wk	-0.0001078	0.0051439	0.0054348	-0.0050218	0.0061895	0.0012838	0.0033887	-0.0175607	0.0201337	0.0059906	0.0019191	0.0022113	-0.0066592	0.009042	0.0023445
Sulphur Loading Rate	mg/kg/wk	0.1854813	0.0681455	0.1876404	0.0793942	0.0158761	0.0754127	0.1652283	-0.2145892	0.4501458	0.4529002	0.0940406	-0.0207218	0.1839868	0.0716847	-0.0030593
Tellurium Loading Rate	mg/kg/wk	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium Loading Rate	mg/kg/wk	-8.21E-06	5.966E-07	4.669E-06	-3.871E-06	2.88E-06	-1.039E-06	2.626E-08	-9.062E-07	2.882E-06	3.424E-06	-5.358E-07	2.227E-06	1.194E-06	-2.23E-06	1.688E-06
Thorium Loading Rate	mg/kg/wk	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tin Loading Rate	mg/kg/wk	-0.0001627	3.509E-06	3.775E-06	3.568E-06	3.509E-06	3.716E-06	3.539E-06	-5.515E-05	1.946E-06	1.622E-06	1.519E-06	5.841E-05	3.038E-06	2.979E-06	2.949E-06
Titanium Loading Rate	mg/kg/wk	-0.0162653	0.0003509	0.0003775	0.0003568	0.0003509	0.0003716	0.0003539	-0.0055146	0.0001946	0.0001622	0.0001519	0.0058407	0.0003038	0.0002979	0.0002949
Tungsten Loading Rate	mg/kg/wk	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Uranium Loading Rate	mg/kg/wk	-0.4652884	-0.0037834	0.2359374	-0.1797203	0.1495211	0.1023057	0.2610172	-1.4	1.1	0.3417069	-0.4247776	-0.3409772	-0.8633425	0.621034	0.210658
Vanadium Loading Rate	mg/kg/wk	-0.0016265	3.509E-05	3.775E-05	3.568E-05	3.509E-05	3.716E-05	3.539E-05	-0.000382	-8.864E-05	0.0001321	0.0001341	0.0003056	3.038E-05	2.979E-05	2.949E-05
Zinc Loading Rate	mg/kg/wk	-0.0016265	3.509E-05	3.775E-05	3.568E-05	0.0011283	-0.0009056	-1.861E-05	0.0001838	0.0004455	-0.0006352	8.602E-05	2.713E-05	3.038E-05	2.979E-05	0.0017427
Zirconium Loading Rate	mg/kg/wk	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sulphate (SO4) Loading Rate	mg/kg/wk	0.556444	0.2044366	0.5629213	0.2381827	0.0476283	0.2262381	0.495685	-0.6437675	1.4	1.4	0.2821218	-0.0621655	0.5519605	0.215054	-0.0091778

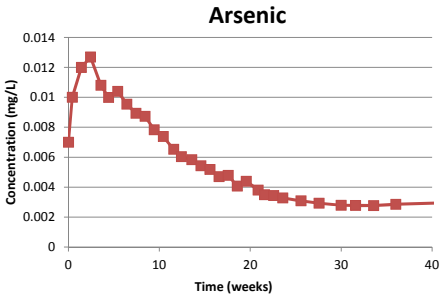
ATTACHMENT A-4

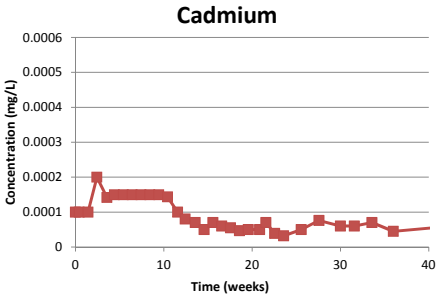
Submerged Column – Concentration Plots – Weeks 0 to 36

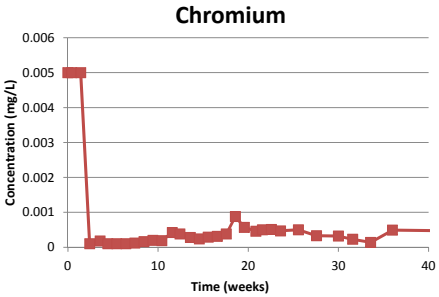
Type 3 Mine Rock Submerged Column Kinetic Testing - Concentrations - Weeks 0 to 36

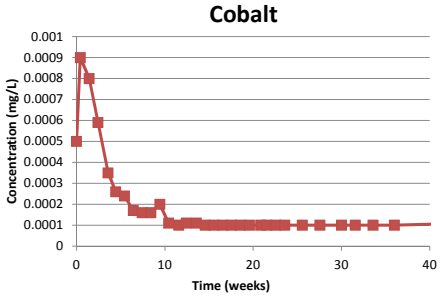


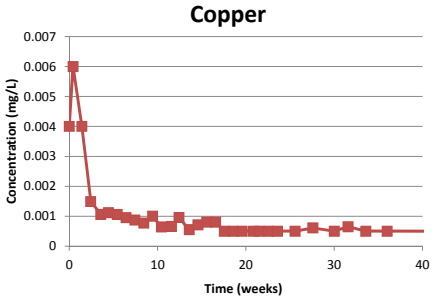


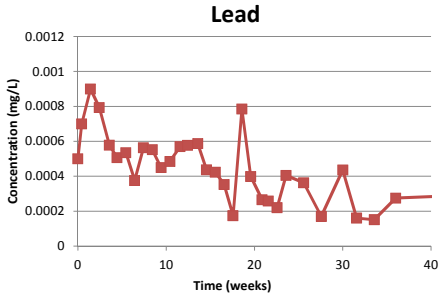


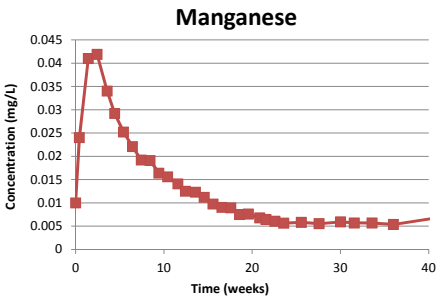


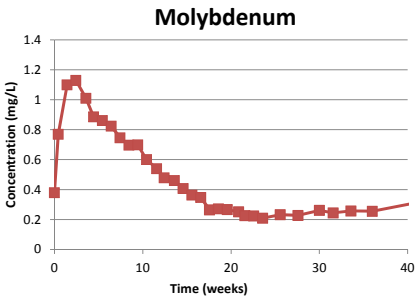


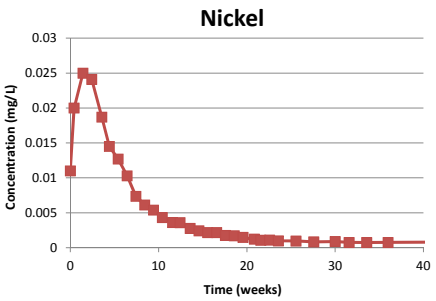


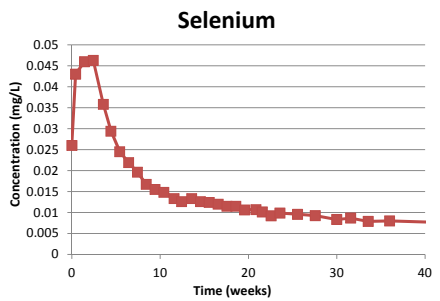


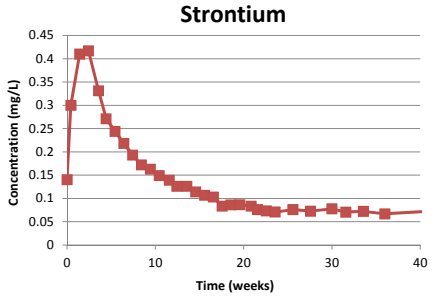


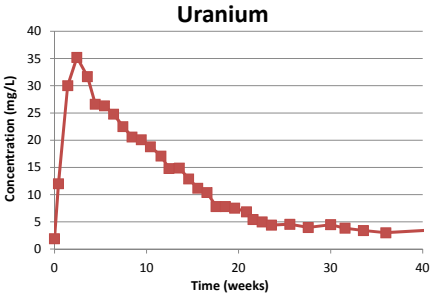


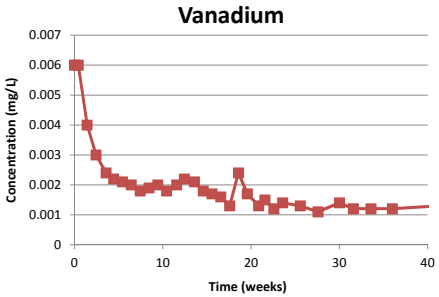


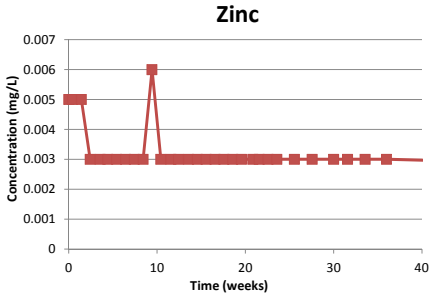


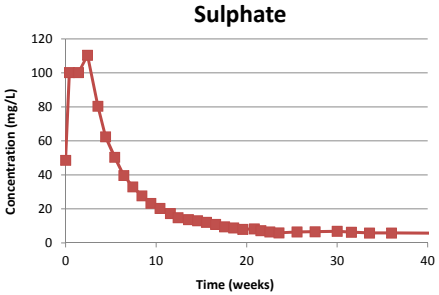


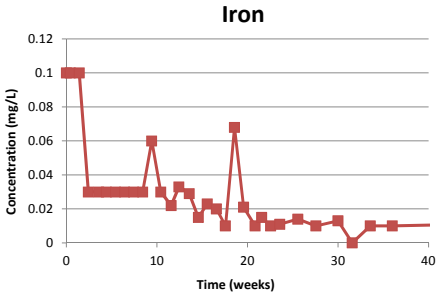

Strontium
Concentration (mg/L)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
10
20
30
40
Time (weeks)


Uranium
Concentration (mg/L)
40
35
30
25
20
15
10
5
0
0
10
20
30
40
Time (weeks)


Vanadium
Concentration (mg/L)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
0
10
20
30
40
Time (weeks)


Zinc
Concentration (mg/L)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
0
10
20
30
40
Time (weeks)

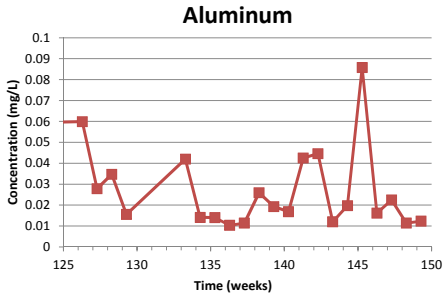

Sulphate
Concentration (mg/L)
120
100
80
60
40
20
0
0
10
20
30
40
Time (weeks)

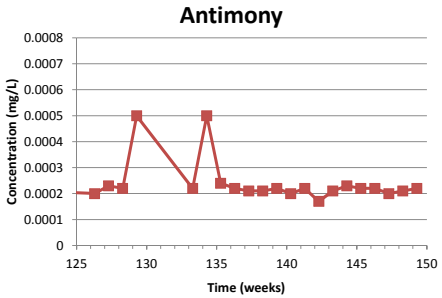

Iron
Concentration (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
0
10
20
30
40
Time (weeks)

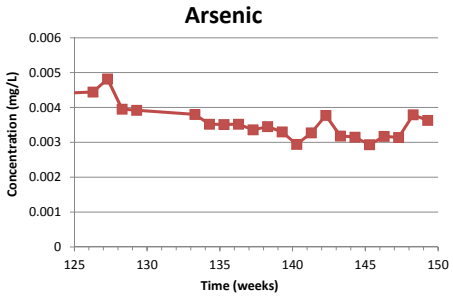
ATTACHMENT A-5

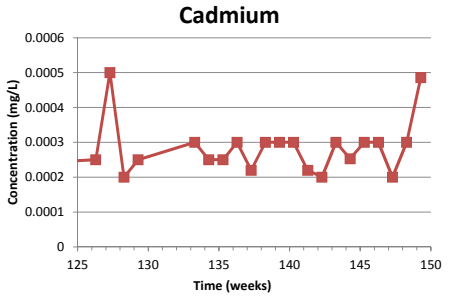
Submerged Column – Concentration Plots – Weeks 126 to 149

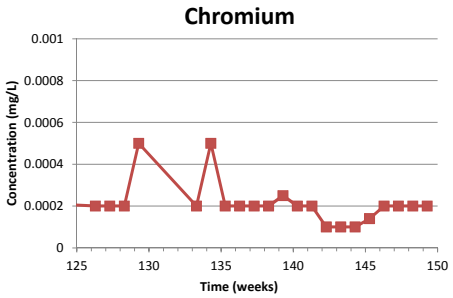
Type 3 Mine Rock Submerged Column Kinetic Testing - Concentrations - Weeks 126 to 149

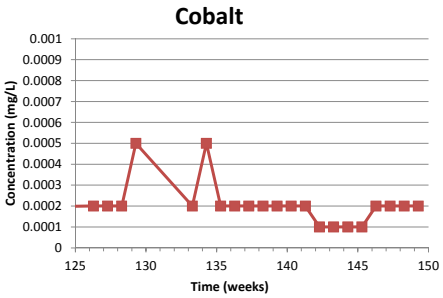


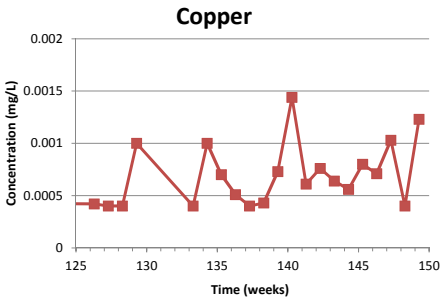


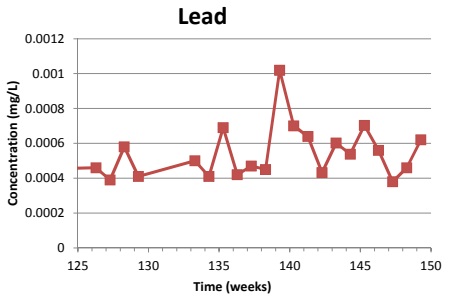


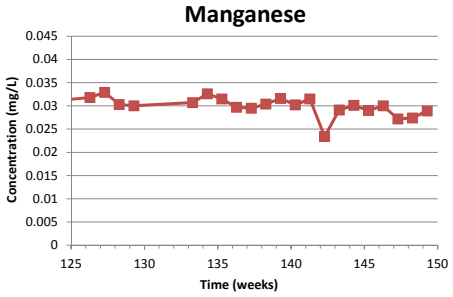


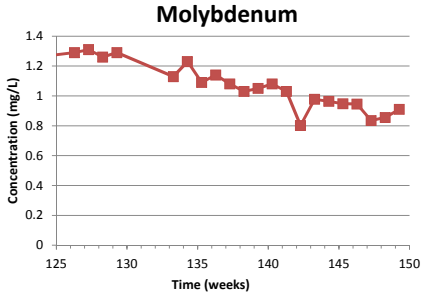


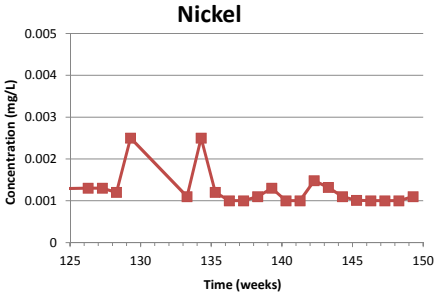


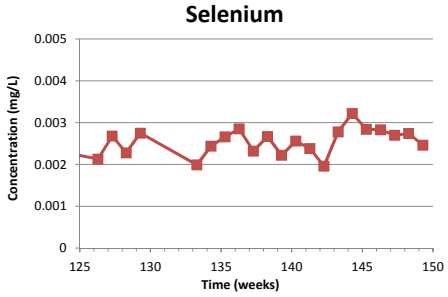


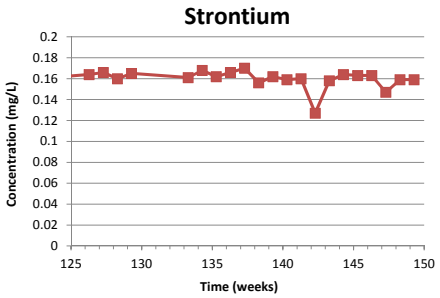


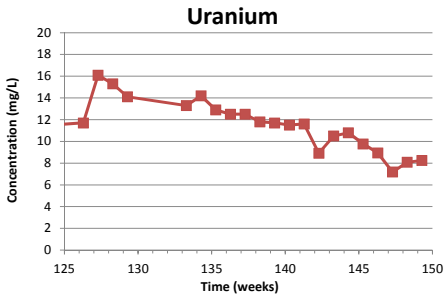


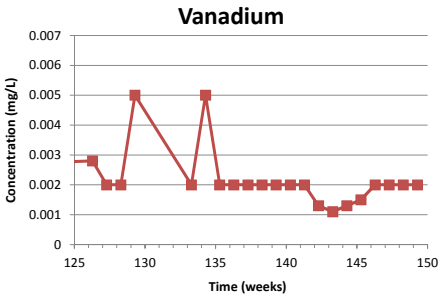


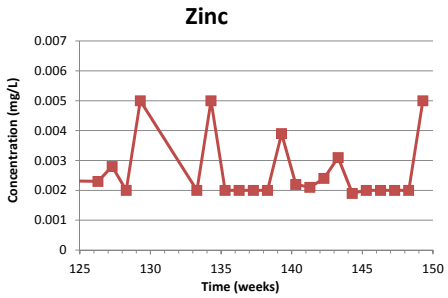


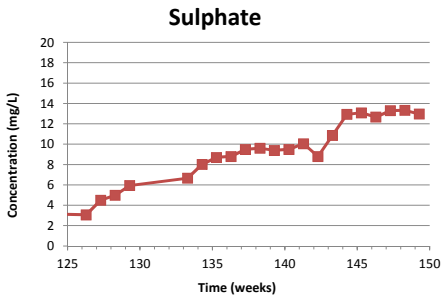


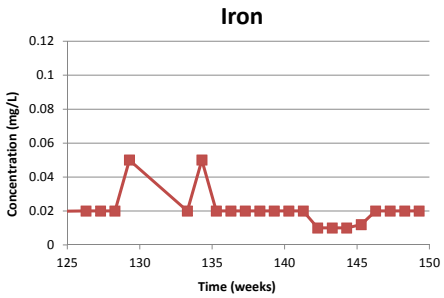

Strontium
Concentration (mg/L)
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
125
130
135
140
145
150
Time (weeks)


Uranium
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
125
130
135
140
145
150
Time (weeks)


Vanadium
Concentration (mg/L)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
125
130
135
140
145
150
Time (weeks)


Zinc
Concentration (mg/L)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
125
130
135
140
145
150
Time (weeks)


Sulphate
Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
125
130
135
140
145
150
Time (weeks)


Iron
Concentration (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
125
130
135
140
145
150
Time (weeks)

ATTACHMENT B-1

Layered Column A – Concentration Summary

Layered Tailings and Type 1 Mine Rock Column Testing - Concentrations - Column A

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	De-ionized Water Concentration	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A
Day			0	5	12	19	26	33	40	47	54	61	68	75	82	89
Week			0.0	0.7	1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7	10.7	11.7	12.7
Water Added (L) - Evaporation				0	0	0.05	0.024	0.03	0.018	0.021	0.053	0.026	0.013	0.022	0.018	0.021
pH	--			6.94	7.08	7.36	7.52	7.44	7.52	7.56	7.5	7.49	7.8	7.54	7.65	7.56
Conductivity	µS/cm			87.7	182	389	580	740	802	904	1074	1041	1153	1218	1301	1373
Aluminum (Al)-Dissolved	mg/L	<0.0005	N/A	0.212	0.0142	0.0049	0.0041	0.0067	0.0053	0.0058	0.0030	<0.0030	0.0038	0.0041	0.0036	0.0313
Antimony (Sb)-Dissolved	mg/L	<0.00005	N/A	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Arsenic (As)-Dissolved	mg/L	<0.00005	N/A	0.00014	0.0061	0.00521	0.00472	0.00766	0.00661	0.00633	0.00521	0.00504	0.00526	0.00530	0.00499	0.00502
Barium (Ba)-Dissolved	mg/L	<0.00003	N/A	0.00088	0.00361	0.0102	0.0181	0.0266	0.0319	0.0401	0.0559	0.0542	0.0611	0.0762	0.0798	0.0897
Beryllium (Be)-Dissolved	mg/L	<0.00005	N/A	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Bismuth (Bi)-Dissolved	mg/L	<0.00025	N/A	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Boron (B)-Dissolved	mg/L	<0.005	N/A	0.047	0.07	0.098	0.135	0.168	0.174	0.193	0.243	0.210	0.236	0.281	0.299	0.291
Cadmium (Cd)-Dissolved	mg/L	<0.00001	N/A	<0.00001	<0.00001	0.000023	0.000014	0.000033	0.000013	0.000013	0.000013	0.000011	0.000014	0.000013	0.000012	0.000015
Calcium (Ca)-Dissolved	mg/L	<0.01	N/A	1.23	11.1	29.2	49.1	67	74.4	83.3	101.0	90.9	99.0	112	115	113.0
Chromium (Cr)-Dissolved	mg/L	<0.00005	N/A	0.0002	<0.0001	<0.0001	<0.0001	0.00052	0.00045	0.00044	0.00048	<0.00010	<0.00010	0.00047	0.00058	0.00057
Cobalt (Co)-Dissolved	mg/L	<0.00005	N/A	0.00023	0.00061	0.00063	0.00041	0.00044	0.00051	0.00051	0.00057	0.00054	0.00056	0.00059	0.00061	0.00059
Copper (Cu)-Dissolved	mg/L	<0.0001	N/A	0.00087	0.00099	0.00142	0.00125	0.00071	0.00067	0.00076	0.00062	0.00089	0.00108	0.00069	0.00068	0.00118
Iron (Fe)-Dissolved	mg/L	<0.005	N/A	0.027	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01	<0.01
Lead (Pb)-Dissolved	mg/L	<0.00003	N/A	0.000067	0.000068	0.000685	0.000102	0.000501	0.000285	0.000226	0.000135	0.000289	0.000090	0.000105	0.000060	0.000082
Lithium (Li)-Dissolved	mg/L	<0.00025	N/A	0.00929	0.0194	0.0314	0.0409	0.045	0.0535	0.0564	0.0576	0.0569	0.0584	0.0660	0.0671	0.0655
Magnesium (Mg)-Dissolved	mg/L	<0.0025	N/A	0.824	5.67	15.2	26.0	36.9	42.6	48.2	61.9	57.8	66.3	78.1	87.3	91.7
Manganese (Mn)-Dissolved	mg/L	0.000221	N/A	0.00114	0.000622	0.000802	0.000566	0.000936	0.000920	0.00111	0.00292	0.00114	0.00185	0.00366	0.00392	0.00558
Molybdenum (Mo)-Dissolved	mg/L	<0.000025	N/A	0.0246	0.0267	0.0313	0.0359	0.0353	0.0383	0.0390	0.0434	0.0368	0.0368	0.0385	0.0358	0.0349
Nickel (Ni)-Dissolved	mg/L	<0.00025	N/A	0.0015	0.00058	0.00259	0.00161	0.00171	0.00176	0.00166	0.00149	0.00127	0.00133	0.00168	0.00343	0.00227
Phosphorus (P)-Dissolved	mg/L	<0.15	N/A	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.30	<0.30	<0.3	<0.3	<0.3
Potassium (K)-Dissolved	mg/L	<0.025	N/A	2.74	7.43	12.8	19.0	27.3	30.6	37.7	41.8	45.1	53.2	61.0	65.7	72.1
Selenium (Se)-Dissolved	mg/L	<0.00005	N/A	0.00033	0.00041	0.00055	0.00067	0.00084	0.00114	0.00105	0.00107	0.00116	0.00116	0.00131	0.00139	0.00148
Silicon (Si)-Dissolved	mg/L	<0.025	N/A	1.31	1.47	1.93	2.58	3.2	4.32	3.42	3.35	3.18	3.08	3.63	3.70	3.54
Silver (Ag)-Dissolved	mg/L	<0.00001	N/A	<0.00001	<0.00001	0.000024	0.000067	<0.0001	<0.00001	<0.00001	<0.00001	<0.000010	<0.000010	<0.00001	0.000023	0.00001
Sodium (Na)-Dissolved	mg/L	0.135	N/A	2.83	5.11	7.31	8.41	10	10.8	10.7	11.2	10.8	11.7	12.3	12.5	13.0
Strontium (Sr)-Dissolved	mg/L	<0.0001	N/A	0.0109	0.101	0.258	0.446	0.633	0.684	0.808	0.950	0.845	0.970	1.08	1.01	1.060
Sulfur (S)-Dissolved	mg/L	<0.25	N/A	0.7	14.1	39.5	67.8	94	105	123	156	149	159	175	184	216
Thallium (Tl)-Dissolved	mg/L	<0.00001	N/A	0.000013	0.000049	0.000087	0.000116	0.000158	0.000180	0.000217	0.000275	0.000269	0.000301	0.000368	0.000382	0.000396
Tin (Sn)-Dissolved	mg/L	<0.00005	N/A	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Titanium (Ti)-Dissolved	mg/L	<0.005	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01	<0.01
Uranium (U)-Dissolved	mg/L	<0.00001	N/A	0.00363	0.00967	0.0681	0.178	0.334	0.159	0.393	0.329	0.370	0.496	0.473	0.369	0.685
Vanadium (V)-Dissolved	mg/L	<0.0005	N/A	0.0014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.001	<0.001	<0.001
Zinc (Zn)-Dissolved	mg/L	0.0016	N/A	0.0042	0.0056	<0.003	0.0047	0.0038	0.0067	<0.003	<0.003	0.0038	<0.0039	0.0044	0.0037	0.0045
Sulphate (calculated)	mg/L	<0.75	N/A	2.1	42.3	118.5	203.4	282	315	369	468	447	477	525	552	648

Notes:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

Layered Tailings and Type 1 Mine Rock Column Testing - Concentrations - Column A

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	De-ionized Water Concentration	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A
Day			96	103	110	117	124	131	138	145	152	159	166
Week			13.7	14.7	15.7	16.7	17.7	18.7	19.7	20.7	21.7	22.7	23.7
Water Added (L) - Evaporation			0.03	0.043	0.014	0.013	0.011	0	0	0.02	0.017	0.041	0.018
pH	--		7.84	7.39	8.19	7.51	7.77	7.27	7.94	8.27	7.76	7.69	7.7
Conductivity	µS/cm		1497	1563	1552	1164	1549	1433	1198	1209	988	841	833
Aluminum (Al)-Dissolved	mg/L	<0.0005	0.0227	0.1090		0.0048		0.0078		0.0214		0.0055	
Antimony (Sb)-Dissolved	mg/L	<0.00005	<0.0001	<0.0001		<0.0001		<0.0001		<0.0001		<0.0001	
Arsenic (As)-Dissolved	mg/L	<0.00005	0.00481	0.00471		0.00447		0.00310		0.00244		0.00195	
Barium (Ba)-Dissolved	mg/L	<0.00003	0.1050	0.1120		0.1100		0.0789		0.0476		0.0329	
Beryllium (Be)-Dissolved	mg/L	<0.00005	<0.0001	<0.0001		<0.0001		<0.0001		<0.0001		<0.0001	
Bismuth (Bi)-Dissolved	mg/L	<0.00025	<0.0005	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	
Boron (B)-Dissolved	mg/L	<0.005	0.297	0.322		0.380		0.296		0.176		0.220	
Cadmium (Cd)-Dissolved	mg/L	<0.00001	0.000037	0.000019		0.000017		0.000026		<0.00001		<0.00001	
Calcium (Ca)-Dissolved	mg/L	<0.01	122.0	132		126		100		58.7		48.5	
Chromium (Cr)-Dissolved	mg/L	<0.00005	0.00035	0.00034		0.00019		<0.0001		<0.0001		<0.0001	
Cobalt (Co)-Dissolved	mg/L	<0.00005	0.00058	0.00061		0.00054		0.00037		0.00027		<0.0001	
Copper (Cu)-Dissolved	mg/L	<0.0001	0.00142	0.00173		0.00105		0.00064		0.00041		0.00031	
Iron (Fe)-Dissolved	mg/L	<0.005	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01	
Lead (Pb)-Dissolved	mg/L	<0.00003	0.000102	0.000200		0.000064		0.000050		0.001410		<0.00005	
Lithium (Li)-Dissolved	mg/L	<0.00025	0.0590	0.0603		0.0688		0.0506		0.0274		0.0237	
Magnesium (Mg)-Dissolved	mg/L	<0.0025	101.0	121.0		125.0		113.0		84.8		71.3	
Manganese (Mn)-Dissolved	mg/L	0.000221	0.00822	0.01480		0.01440		0.01920		0.01740		0.000854	
Molybdenum (Mo)-Dissolved	mg/L	<0.000025	0.0389	0.0418		0.0404		0.0338		0.0201		0.0178	
Nickel (Ni)-Dissolved	mg/L	<0.00025	0.00144	0.00151		0.00163		0.00096		0.00053		0.00082	
Phosphorus (P)-Dissolved	mg/L	<0.15	<0.3	<0.3		<0.3		<0.3		<0.3		<0.3	
Potassium (K)-Dissolved	mg/L	<0.025	78.7	87.5		86.6		78.8		63.7		52.7	
Selenium (Se)-Dissolved	mg/L	<0.00005	0.00153	0.00183		0.00193		0.00142		0.00107		0.00083	
Silicon (Si)-Dissolved	mg/L	<0.025	3.63	3.68		3.67		2.75		2.14		1.82	
Silver (Ag)-Dissolved	mg/L	<0.00001	<0.00001	<0.00001		<0.00001		<0.00001		0.000012		<0.00001	
Sodium (Na)-Dissolved	mg/L	0.135	12.4	13.1		12.4		09.6		06.5		4.74	
Strontium (Sr)-Dissolved	mg/L	<0.0001	1.150	1.21		1.10		0.90		0.50		0.387	
Sulfur (S)-Dissolved	mg/L	<0.25	227	270		279		222		172		141	
Thallium (Tl)-Dissolved	mg/L	<0.00001	0.000448	0.000491		0.000493		0.000440		0.000315		0.000319	
Tin (Sn)-Dissolved	mg/L	<0.00005	<0.0001	<0.0001		<0.0001		<0.0001		<0.0001		<0.0001	
Titanium (Ti)-Dissolved	mg/L	<0.005	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01	
Uranium (U)-Dissolved	mg/L	<0.00001	0.751	0.940		0.740		0.642		0.280		0.180	
Vanadium (V)-Dissolved	mg/L	<0.0005	<0.001	<0.001		<0.001		<0.001		<0.001		<0.001	
Zinc (Zn)-Dissolved	mg/L	0.0016	0.0034	0.0091		0.0031		<0.003		0.0034		0.0034	
Sulphate (calculated)	mg/L	<0.75	681	810		837		666		516		423	

Notes:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

Layered Tailings and Type 1 Mine Rock Column Testing -
Concentrations - Column A

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	De-ionized Water Concentration	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A - Adjusted for Evaporation
Day			173	180	187	194	201	208	215	222	229	335	335
Week			24.7	25.7	26.7	27.7	28.7	29.7	30.7	31.7	32.7	47.9	47.9
Water Added (L) - Evaporation			0.043	0.04	0.04	0.058	0.009	0.12	0	0.01	0.038	0.753	
pH	--		7.62	7.4	7.45	7.7	7.17	7.67	7.65	7.70	7.81	8.07	8.39
Conductivity	µS/cm		612	664	701	693	687	620	428	654	664	2243	1070
Aluminum (Al)-Dissolved	mg/L	<0.0005	0.0078		0.0055		0.0056					0.0054	0.0026
Antimony (Sb)-Dissolved	mg/L	<0.00005	<0.00010		<0.00010		<0.00010					<0.0002	<0.0001
Arsenic (As)-Dissolved	mg/L	<0.00005	0.00152		0.00129		0.00116					0.00186	0.000887
Barium (Ba)-Dissolved	mg/L	<0.00003	0.0247		0.0201		0.0163					0.0531	0.0253
Beryllium (Be)-Dissolved	mg/L	<0.00005	<0.00010		<0.00010		<0.00010					<0.0002	<0.0001
Bismuth (Bi)-Dissolved	mg/L	<0.00025	<0.00050		<0.00050		<0.00050					<0.001	<0.0005
Boron (B)-Dissolved	mg/L	<0.005	0.178		0.191		0.151					0.530	0.253
Cadmium (Cd)-Dissolved	mg/L	<0.00001	<0.000010		<0.000010		<0.000010					<0.00002	<0.00001
Calcium (Ca)-Dissolved	mg/L	<0.01	43.1		39.6		32.0					122	58.2
Chromium (Cr)-Dissolved	mg/L	<0.00005	<0.00010		<0.00010		<0.00010					<0.0002	<0.0001
Cobalt (Co)-Dissolved	mg/L	<0.00005	<0.00010		<0.00010		<0.00010					0.00022	0.00010
Copper (Cu)-Dissolved	mg/L	<0.0001	0.00037		0.00026		0.00040					0.00063	0.00030
Iron (Fe)-Dissolved	mg/L	<0.005	<0.010		<0.010		<0.010					<0.02	<0.01
Lead (Pb)-Dissolved	mg/L	<0.00003	0.000120		0.000071		0.000317					<0.0001	<0.00005
Lithium (Li)-Dissolved	mg/L	<0.00025	0.0225		0.0200		0.0150					0.0574	0.0274
Magnesium (Mg)-Dissolved	mg/L	<0.0025	69.8		62.8		53.6					244	116
Manganese (Mn)-Dissolved	mg/L	0.000221	0.000436		0.000678		0.000773					0.0394	0.0188
Molybdenum (Mo)-Dissolved	mg/L	<0.000025	0.0185		0.0169		0.0142					0.0587	0.0280
Nickel (Ni)-Dissolved	mg/L	<0.00025	<0.00050		<0.00050		<0.00050					<0.001	<0.0005
Phosphorus (P)-Dissolved	mg/L	<0.15	<0.30		<0.30		<0.30					<0.6	<0.3
Potassium (K)-Dissolved	mg/L	<0.025	55.1		47.7		40.1					110	52.5
Selenium (Se)-Dissolved	mg/L	<0.00005	0.00080		0.00076		0.00064					0.00241	0.00115
Silicon (Si)-Dissolved	mg/L	<0.025	1.72		1.58		1.31					2.95	1.41
Silver (Ag)-Dissolved	mg/L	<0.00001	<0.000010		<0.000010		0.000012					0.000024	0.000011
Sodium (Na)-Dissolved	mg/L	0.135	4.18		3.55		2.81					9.73	4.64
Strontium (Sr)-Dissolved	mg/L	<0.0001	0.325		0.286		0.221					0.661	0.315
Sulfur (S)-Dissolved	mg/L	<0.25	126		111		100					413	197
Thallium (Tl)-Dissolved	mg/L	<0.00001	0.000283		0.000272		0.000227					0.000544	0.000259
Tin (Sn)-Dissolved	mg/L	<0.00005	<0.00010		<0.00010		<0.00010					<0.0002	<0.0001
Titanium (Ti)-Dissolved	mg/L	<0.005	<0.010		<0.010		<0.010					<0.02	<0.01
Uranium (U)-Dissolved	mg/L	<0.00001	0.124		0.101		0.0686					0.457	0.218
Vanadium (V)-Dissolved	mg/L	<0.0005	<0.0010		<0.0010		<0.0010					<0.002	<0.001
Zinc (Zn)-Dissolved	mg/L	0.0016	0.0027		0.0018		0.0016					<0.002	<0.001
Sulphate (calculated)	mg/L	<0.75	378		333		300					1239	590.9

Notes:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

ATTACHMENT B-2

Layered Column B – Concentration Summary

Layered Tailings and Type 1 Mine Rock Column Testing - Concentrations - Column B

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	De-ionized Water Concentration	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B
Day			0	5	12	19	26	33	40	47	54	61	68	75	82
Week			0.0	0.7	1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7	10.7	11.7
Water Added (L) - Evaporation				0	0	0.04	0.018	0.018	0.013	0.03	0.111	0.053	0.025	0.026	0.018
pH	--			7.09	7.3	7.52	7.62	7.71	7.66	7.49	7.61	7.75	7.84	7.6	7.61
Conductivity	µS/cm			42.9	113.5	232.6	354	462	539	618	806	869	926	986	990
Aluminum (Al)-Dissolved	mg/L	<0.0005	N/A	0.0759	0.0065	0.0208	0.0062	0.0068	0.0031	0.0046	0.0030	0.0040	<0.0030	0.0047	<0.003
Antimony (Sb)-Dissolved	mg/L	<0.00005	N/A	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001
Arsenic (As)-Dissolved	mg/L	<0.00005	N/A	0.00583	0.00018	0.00023	0.00023	0.00022	0.00020	0.00020	0.00025	0.00039	0.00021	0.00025	0.00025
Barium (Ba)-Dissolved	mg/L	<0.00003	N/A	0.00148	0.00191	0.00493	0.00828	0.0115	0.0150	0.0177	0.0290	0.0342	0.0370	0.0481	0.0503
Beryllium (Be)-Dissolved	mg/L	<0.00005	N/A	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001
Bismuth (Bi)-Dissolved	mg/L	<0.00025	N/A	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.0005	<0.0005
Boron (B)-Dissolved	mg/L	<0.005	N/A	0.037	0.097	0.137	0.147	0.175	0.181	0.189	0.223	0.253	0.229	0.261	0.270
Cadmium (Cd)-Dissolved	mg/L	<0.00001	N/A	<0.00001	0.000021	0.000027	0.000018	0.000034	0.000018	0.000018	0.000011	0.000021	0.000014	0.000019	0.000012
Calcium (Ca)-Dissolved	mg/L	<0.01	N/A	3.22	5.65	14.5	26.1	38.6	48.2	54.4	75.4	95.2	88.1	103	105
Chromium (Cr)-Dissolved	mg/L	<0.00005	N/A	<0.0001	<0.0001	<0.0001	<0.0001	0.00054	0.00050	0.00049	0.00043	<0.00010	<0.00010	0.00040	0.00044
Cobalt (Co)-Dissolved	mg/L	<0.00005	N/A	0.00032	0.00036	0.00046	0.00050	0.00052	0.00052	0.00052	0.00059	0.00056	0.00048	0.00046	0.00045
Copper (Cu)-Dissolved	mg/L	<0.0001	N/A	0.00082	0.00126	0.00143	0.00139	0.00084	0.00083	0.00087	0.00076	0.00140	0.00106	0.00075	0.00067
Iron (Fe)-Dissolved	mg/L	<0.005	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01
Lead (Pb)-Dissolved	mg/L	<0.00003	N/A	<0.00005	<0.00005	0.000131	0.000082	0.000203	0.000095	0.000093	0.000114	0.000170	0.000281	0.000086	0.000067
Lithium (Li)-Dissolved	mg/L	<0.00025	N/A	0.00913	0.0212	0.0319	0.0402	0.0453	0.0556	0.0580	0.0624	0.0784	0.0666	0.0737	0.0732
Magnesium (Mg)-Dissolved	mg/L	<0.0025	N/A	2.16	2.99	7.44	12.9	19.1	23.6	26.0	37.0	41.4	46.3	52.9	58.1
Manganese (Mn)-Dissolved	mg/L	0.000221	N/A	0.00154	0.000464	0.000362	0.000567	0.000431	0.000390	0.000828	0.001820	0.00243	0.00196	0.00319	0.00353
Molybdenum (Mo)-Dissolved	mg/L	<0.000025	N/A	0.0153	0.0545	0.0608	0.0641	0.0608	0.0623	0.0590	0.0649	0.0656	0.0537	0.0531	0.0486
Nickel (Ni)-Dissolved	mg/L	<0.00025	N/A	0.00077	0.00073	0.00192	0.00142	0.00163	0.00153	0.00176	0.00142	0.00123	0.00103	0.00144	0.00124
Phosphorus (P)-Dissolved	mg/L	<0.15	N/A	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.30	<0.30	<0.3	<0.3
Potassium (K)-Dissolved	mg/L	<0.025	N/A	3.64	5.91	8.67	11.4	15.3	16.9	19.5	22.0	27.1	32.9	36.0	38.5
Selenium (Se)-Dissolved	mg/L	<0.00005	N/A	0.00028	0.00052	0.00062	0.00067	0.00079	0.00078	0.00088	0.00094	0.00111	0.00111	0.00121	0.00130
Silicon (Si)-Dissolved	mg/L	<0.025	N/A	1.01	1.87	2.39	2.92	3.43	3.57	3.68	3.88	3.83	3.66	4.17	4.31
Silver (Ag)-Dissolved	mg/L	<0.00001	N/A	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000010	0.000650	<0.00001	0.000113
Sodium (Na)-Dissolved	mg/L	0.135	N/A	2.89	5.49	7.48	8.73	10.6	11.3	11.6	12.2	12.7	13.2	13.6	13.6
Strontium (Sr)-Dissolved	mg/L	<0.0001	N/A	0.0291	0.0519	0.123	0.220	0.344	0.408	0.489	0.696	0.845	0.834	0.967	0.936
Sulfur (S)-Dissolved	mg/L	<0.25	N/A	5.2	4.08	14.1	27.2	41.6	53.6	61.8	94.5	108	113	126	134
Thallium (Tl)-Dissolved	mg/L	<0.00001	N/A	0.000018	0.000043	0.000059	0.000068	0.0001	0.000105	0.000123	0.000165	0.000195	0.000189	0.000231	0.000251
Tin (Sn)-Dissolved	mg/L	<0.00005	N/A	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.0001	<0.0001
Titanium (Ti)-Dissolved	mg/L	<0.005	N/A	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01
Uranium (U)-Dissolved	mg/L	<0.00001	N/A	0.00334	0.00933	0.0398	0.105	0.176	0.157	0.362	0.436	0.560	0.609	0.548	0.540
Vanadium (V)-Dissolved	mg/L	<0.0005	N/A	<0.001	0.0013	0.0011	0.0011	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.001	<0.001
Zinc (Zn)-Dissolved	mg/L	0.0016	N/A	<0.003	0.006	<0.003	0.0032	0.0073	0.0034	0.0051	0.0030	<0.0030	<0.0030	<0.003	0.0039
Sulphate (calculated)	mg/L	<0.75	N/A	15.6	12.24	42.3	81.6	124.8	160.8	185.4	283.5	324	339	378	402

Notes:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

Layered Tailings and Type 1 Mine Rock Column Testing - Concentrations - Column B

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	De-ionized Water Concentration	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B
Day			89	96	103	110	117	124	131	138	145	152	159	166	173
Week			12.7	13.7	14.7	15.7	16.7	17.7	18.7	19.7	20.7	21.7	22.7	23.7	24.7
Water Added (L) - Evaporation			0.017	0.011	0.029	0.009	0.015	0	0.014	0.013	0.017	0.011	0.025	0	0.012
pH	--		7.49	7.92	7.34	8.2	7.52	7.79	7.2	N/A	8.05	7.93	7.63	7.62	7.77
Conductivity	µS/cm		1092	1171	1111	1249	933	1340	1243	N/A	606	652	648	833	531
Aluminum (Al)-Dissolved	mg/L	<0.0005	0.0083	0.0055	0.0792		0.0039		0.0085		0.0044		0.0078		0.0061
Antimony (Sb)-Dissolved	mg/L	<0.00005	<0.0001	<0.0001	<0.0001		<0.0001		<0.0001		<0.0001		<0.0001		<0.00010
Arsenic (As)-Dissolved	mg/L	<0.00005	0.00021	0.00018	0.00027		0.00018		0.00017		0.00012		0.00018		0.00024
Barium (Ba)-Dissolved	mg/L	<0.00003	0.0556	0.0681	0.0731		0.0848		0.0698		0.0452		0.0345		0.0306
Beryllium (Be)-Dissolved	mg/L	<0.00005	<0.0001	<0.0001	<0.0001		<0.0001		<0.0001		<0.0001		<0.0001		<0.00010
Bismuth (Bi)-Dissolved	mg/L	<0.00025	<0.0005	<0.0005	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005		<0.00050
Boron (B)-Dissolved	mg/L	<0.005	0.264	0.243	0.262		0.324		0.237		0.133		0.145		0.126
Cadmium (Cd)-Dissolved	mg/L	<0.00001	0.000013	0.000044	0.000018		0.000019		0.000029		<0.00001		<0.00001		<0.000010
Calcium (Ca)-Dissolved	mg/L	<0.01	105	114	124		124		99.9		57.5		44.8		42.8
Chromium (Cr)-Dissolved	mg/L	<0.00005	0.00057	0.00029	0.00032		0.00032		<0.0001		<0.0001		<0.0001		<0.00010
Cobalt (Co)-Dissolved	mg/L	<0.00005	0.00045	0.00044	0.00044		0.0004		0.00027		0.00014		<0.0001		<0.00010
Copper (Cu)-Dissolved	mg/L	<0.0001	0.00069	0.00117	0.00155		0.00139		0.0006		0.00037		0.00038		0.00045
Iron (Fe)-Dissolved	mg/L	<0.005	<0.01	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		<0.010
Lead (Pb)-Dissolved	mg/L	<0.00003	0.000097	0.000112	0.000149		0.000093		0.000075		0.000423		<0.00005		0.000088
Lithium (Li)-Dissolved	mg/L	<0.00025	0.0724	0.063	0.0645		0.0737		0.0532		0.0264		0.0208		0.0207
Magnesium (Mg)-Dissolved	mg/L	<0.0025	60.4	63.8	72.5		80.6		73.5		49.6		42.1		43.8
Manganese (Mn)-Dissolved	mg/L	0.000221	0.00361	0.00509	0.00829		0.00911		0.0112		0.0108		0.0113		0.0105
Molybdenum (Mo)-Dissolved	mg/L	<0.000025	0.0445	0.047	0.0457		0.0434		0.0332		0.0182		0.0136		0.0144
Nickel (Ni)-Dissolved	mg/L	<0.00025	0.00121	0.00116	0.00118		0.00126		0.00067		<0.0005		<0.0005		<0.00050
Phosphorus (P)-Dissolved	mg/L	<0.15	<0.3	<0.3	<0.3		<0.3		<0.3		<0.3		<0.3		<0.30
Potassium (K)-Dissolved	mg/L	<0.025	42.4	46.7	52.4		56.7		53.4		42.2		36.7		38.3
Selenium (Se)-Dissolved	mg/L	<0.00005	0.00124	0.0013	0.00143		0.00166		0.00113		0.00078		0.00055		0.00051
Silicon (Si)-Dissolved	mg/L	<0.025	4.03	4.01	4.12		4.23		3.14		2.24		1.88		1.73
Silver (Ag)-Dissolved	mg/L	<0.00001	<0.00001	0.000014	<0.00001		<0.00001		<0.00001		<0.00001		0.000023		<0.000010
Sodium (Na)-Dissolved	mg/L	0.135	14.3	13.2	13.4		13.4		9.59		5.8		4.18		3.89
Strontium (Sr)-Dissolved	mg/L	<0.0001	0.972	1.09	1.15		1.12		0.956		0.534		0.390		0.370
Sulfur (S)-Dissolved	mg/L	<0.25	155	154	194		202		165		116		92.3		89.5
Thallium (Tl)-Dissolved	mg/L	<0.00001	0.000263	0.000279	0.000307		0.000339		0.000318		0.000241		0.000229		0.000214
Tin (Sn)-Dissolved	mg/L	<0.00005	<0.0001	<0.0001	<0.0001		<0.0001		<0.0001		<0.0001		<0.0001		<0.00010
Titanium (Ti)-Dissolved	mg/L	<0.005	<0.01	<0.01	<0.01		<0.01		<0.01		<0.01		<0.01		<0.010
Uranium (U)-Dissolved	mg/L	<0.00001	0.82	0.878	1.05		0.893		0.746		0.293		0.157		0.133
Vanadium (V)-Dissolved	mg/L	<0.0005	<0.001	<0.001	<0.001		<0.001		<0.001		<0.001		<0.001		<0.0010
Zinc (Zn)-Dissolved	mg/L	0.0016	<0.003	<0.003	0.0081		0.0038		0.0035		0.0015		0.0018		0.0033
Sulphate (calculated)	mg/L	<0.75	465	462	582		606		495		348		276.9		268.5

Notes:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

Layered Tailings and Type 1 Mine Rock Column Testing - Concentrations - Column B

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	De-ionized Water Concentration	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B - Adjusted for Evaporation
Day			180	187	194	201	208	215	222	229	335	335
Week			25.7	26.7	27.7	28.7	29.7	30.7	31.7	32.7	47.9	47.9
Water Added (L) - Evaporation			0.06	0.053	0.015	0	0.09	0	0.01	0.017		0.588
pH	--		7.45	7.35	7.58	6.97	7.75	8.03	7.71	7.80	8.13	8.42
Conductivity	µS/cm		568	587	540	597	532	399	565	569	2287	1182
Aluminum (Al)-Dissolved	mg/L	<0.0005		0.0171		0.0036					0.0028	0.0014
Antimony (Sb)-Dissolved	mg/L	<0.00005		<0.00010		<0.00010					<0.0002	<0.0001
Arsenic (As)-Dissolved	mg/L	<0.00005		0.00011		0.00011					0.00029	0.0001
Barium (Ba)-Dissolved	mg/L	<0.00003		0.0271		0.0225					0.115	0.0595
Beryllium (Be)-Dissolved	mg/L	<0.00005		<0.00010		<0.00010					<0.0002	<0.0001
Bismuth (Bi)-Dissolved	mg/L	<0.00025		<0.00050		<0.00050					<0.001	<0.00052
Boron (B)-Dissolved	mg/L	<0.005		0.138		0.113					0.442	0.2285
Cadmium (Cd)-Dissolved	mg/L	<0.00001		<0.000010		<0.000010					<0.00002	<0.00001
Calcium (Ca)-Dissolved	mg/L	<0.01		40.1		33.4					137	70.8337
Chromium (Cr)-Dissolved	mg/L	<0.00005		0.00012		<0.00010					<0.0002	<0.0001
Cobalt (Co)-Dissolved	mg/L	<0.00005		<0.00010		<0.00010					<0.0002	<0.0001
Copper (Cu)-Dissolved	mg/L	<0.0001		0.00041		0.00035					0.00041	0.0002
Iron (Fe)-Dissolved	mg/L	<0.005		<0.010		<0.010					<0.02	<0.01034
Lead (Pb)-Dissolved	mg/L	<0.00003		0.000109		0.000195					<0.0001	<0.00005
Lithium (Li)-Dissolved	mg/L	<0.00025		0.0184		0.0145					0.0629	0.0325
Magnesium (Mg)-Dissolved	mg/L	<0.0025		42.5		38.7					244	126.1564
Manganese (Mn)-Dissolved	mg/L	0.000221		0.00575		0.00359					0.00054	0.0003
Molybdenum (Mo)-Dissolved	mg/L	<0.000025		0.0133		0.0116					0.0555	0.0287
Nickel (Ni)-Dissolved	mg/L	<0.00025		<0.00050		<0.00050					<0.001	<0.00052
Phosphorus (P)-Dissolved	mg/L	<0.15		<0.30		<0.30					<0.6	<0.31022
Potassium (K)-Dissolved	mg/L	<0.025		37.4		31.7					109	56.3567
Selenium (Se)-Dissolved	mg/L	<0.00005		0.00047		0.00037					0.00134	0.0007
Silicon (Si)-Dissolved	mg/L	<0.025		1.67		1.45					3.08	1.5925
Silver (Ag)-Dissolved	mg/L	<0.00001		<0.000010		<0.000010					<0.00002	<0.00001
Sodium (Na)-Dissolved	mg/L	0.135		3.30		2.64					11.5	5.9459
Strontium (Sr)-Dissolved	mg/L	<0.0001		0.341		0.279					0.974	0.5036
Sulfur (S)-Dissolved	mg/L	<0.25		83.2		79.5					362	187.1664
Thallium (Tl)-Dissolved	mg/L	<0.00001		0.000223		0.000198					0.000558	0.0003
Tin (Sn)-Dissolved	mg/L	<0.00005		<0.00010		<0.00010					<0.0002	<0.0001
Titanium (Ti)-Dissolved	mg/L	<0.005		<0.010		<0.010					<0.02	<0.01034
Uranium (U)-Dissolved	mg/L	<0.00001		0.114		0.0844					0.898	0.4643
Vanadium (V)-Dissolved	mg/L	<0.0005		<0.0010		<0.0010					<0.002	<0.00103
Zinc (Zn)-Dissolved	mg/L	0.0016		0.0059		0.0013					<0.002	<0.00103
Sulphate (calculated)	mg/L	<0.75		249.6		238.5					1086	561.4993

Notes:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

ATTACHMENT B-3

Layered Column A – Mass Flux Summary

Layered Tailings and Type 1 Mine Rock Column Testing - Loadings - Column A

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A
Day		0	5	12	19	26	33	40	47	54	61	68	75
Week		0.0	0.7	1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7	10.7
Aluminum (Al)-Dissolved	mg/m2-week	N/A	25	-15.6488	-0.7347	-0.0419	0.2249	-0.0864	0.0592	-0.2149	0.0133	0.0778	0.0357
Antimony (Sb)-Dissolved	mg/m2-week	N/A	0.0058	0.0002	-0.0001	0.0002	0.0001	0.0002	0.0001	0.0000	0.0002	0.0002	0.0001
Arsenic (As)-Dissolved	mg/m2-week	N/A	0.0105	0.4977	-0.0648	-0.0116	0.2575	-0.0504	0.0024	-0.0763	0.0150	0.0422	0.0216
Barium (Ba)-Dissolved	mg/m2-week	N/A	0.0999	0.2313	0.5349	0.7049	0.7616	0.5631	0.7981	1.4	0.1749	0.8313	1.5
Beryllium (Be)-Dissolved	mg/m2-week	N/A	0.0058	0.0002	-0.0001	0.0002	0.0001	0.0002	0.0001	0.0000	0.0002	0.0002	0.0001
Bismuth (Bi)-Dissolved	mg/m2-week	N/A	0.0292	0.0010	-0.0004	0.0010	0.0005	0.0009	0.0007	-0.0002	0.0010	0.0010	0.0006
Boron (B)-Dissolved	mg/m2-week	N/A	4.9	2.1	2.3	3.5	3.2	1.3	2.2	4.4	-1.3734	3.1	4.5
Cadmium (Cd)-Dissolved	mg/m2-week	N/A	0.0006	0.0000	0.0010	-0.0006	0.0016	-0.0015	0.0000	0.0000	-0.0001	0.0003	-0.0001
Calcium (Ca)-Dissolved	mg/m2-week	N/A	143	829	1471	1795	1645	928	1021	1606	-259.7788	1107	1418
Chromium (Cr)-Dissolved	mg/m2-week	N/A	0.0175	-0.0077	-0.0001	0.0002	0.0344	-0.0036	0.0007	0.0039	-0.0288	0.0002	0.0305
Cobalt (Co)-Dissolved	mg/m2-week	N/A	0.0210	0.0324	0.0021	-0.0149	0.0037	0.0076	0.0017	0.0057	0.0004	0.0040	0.0042
Copper (Cu)-Dissolved	mg/m2-week	N/A	0.0900	0.0131	0.0354	-0.0067	-0.0400	-0.0005	0.0095	-0.0101	0.0249	0.0194	-0.0287
Iron (Fe)-Dissolved	mg/m2-week	N/A	2.6	-1.3294	-0.0087	0.0209	0.0099	0.0186	0.0133	-0.0043	0.0206	0.0203	0.0113
Lead (Pb)-Dissolved	mg/m2-week	N/A	0.0049	0.0003	0.0497	-0.0442	0.0328	-0.0156	-0.0039	-0.0069	0.0132	-0.0152	0.0014
Lithium (Li)-Dissolved	mg/m2-week	N/A	1.1	0.8804	1.0	1.0	0.4854	0.9129	0.4450	0.2194	0.2648	0.3964	0.8299
Magnesium (Mg)-Dissolved	mg/m2-week	N/A	96	408	774	971	987	645	626	1207	12	981	1204
Manganese (Mn)-Dissolved	mg/m2-week	N/A	0.1074	-0.0395	0.0143	-0.0164	0.0311	0.0018	0.0181	0.1468	-0.1310	0.0630	0.1542
Molybdenum (Mo)-Dissolved	mg/m2-week	N/A	2.9	0.2750	0.4014	0.5515	0.0840	0.4149	0.2062	0.4395	-0.2970	0.1769	0.2697
Nickel (Ni)-Dissolved	mg/m2-week	N/A	0.1460	-0.0717	0.1616	-0.0677	0.0128	0.0108	-0.0027	-0.0113	-0.0114	0.0097	0.0323
Phosphorus (P)-Dissolved	mg/m2-week	N/A	18	0.6087	-0.2609	0.6261	0.2957	0.5565	0.4000	-0.1304	0.6174	0.6087	0.3391
Potassium (K)-Dissolved	mg/m2-week	N/A	317	402	441	580	749	402	703	412	505	887	829
Selenium (Se)-Dissolved	mg/m2-week	N/A	0.0327	0.0078	0.0116	0.0126	0.0161	0.0284	-0.0032	0.0037	0.0130	0.0053	0.0162
Silicon (Si)-Dissolved	mg/m2-week	N/A	150	19	39	64	60	107	-57.3604	1.8	4.7	6.9	56
Silver (Ag)-Dissolved	mg/m2-week	N/A	0.0006	0.0000	0.0011	0.0036	0.0029	-0.0070	0.0000	0.0000	0.0000	0.0000	0.0000
Sodium (Na)-Dissolved	mg/m2-week	N/A	315	201	183	130	160	113	33	63	29	126	90
Strontium (Sr)-Dissolved	mg/m2-week	N/A	1.3	7.6	13	17	17	7.2	13	13	-3.2630	14	12
Sulfur (S)-Dissolved	mg/m2-week	N/A	53	1120	2061	2540	2391	1352	1887	2922	302	1543	1876
Thallium (Tl)-Dissolved	mg/m2-week	N/A	0.0009	0.0030	0.0031	0.0028	0.0038	0.0025	0.0037	0.0051	0.0010	0.0039	0.0065
Tin (Sn)-Dissolved	mg/m2-week	N/A	0.0058	0.0002	-0.0001	0.0002	0.0001	0.0002	0.0001	0.0000	0.0002	0.0002	0.0001
Titanium (Ti)-Dissolved	mg/m2-week	N/A	0.5842	0.0203	-0.0087	0.0209	0.0099	0.0186	0.0133	-0.0043	0.0206	0.0203	0.0113
Uranium (U)-Dissolved	mg/m2-week	N/A	0.4235	0.5188	4.7	9.4	13	-12.8340	20	-4.2786	5.2	12	-0.1361
Vanadium (V)-Dissolved	mg/m2-week	N/A	0.1052	-0.0297	-0.0009	0.0021	0.0010	0.0019	0.0013	-0.0004	0.0021	0.0020	0.0011
Zinc (Zn)-Dissolved	mg/m2-week	N/A	0.3038	0.1274	-0.2094	0.1451	-0.0648	0.2478	-0.2864	-0.0018	0.0710	0.0176	0.0472
Sulphate (calculated)	mg/m2-week	N/A	158	3360	6184	7621	7173	4056	5660	8767	905	4628	5628

Note:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

Layered Tailings and Type 1 Mine Rock Column Testing - Loadings - Column A

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A	Column A
Day		82	89	96	103	110	117	124	131	138	145	152	159
Week		11.7	12.7	13.7	14.7	15.7	16.7	17.7	18.7	19.7	20.7	21.7	22.7
Aluminum (Al)-Dissolved	mg/m2-week	-0.0263	2.3	-0.5947	7.1		-4.0769		0.2970		1.0		-0.2884
Antimony (Sb)-Dissolved	mg/m2-week	0.0002	0.0001	0.0001	0.0000		0.0002		0.0015		0.0013		0.0013
Arsenic (As)-Dissolved	mg/m2-week	-0.0031	0.0216	0.0003	0.0075		0.0087		0.0535		0.0485		0.0392
Barium (Ba)-Dissolved	mg/m2-week	0.6234	1.1	1.6	0.9135		0.3741		1.5		0.4714		0.5140
Beryllium (Be)-Dissolved	mg/m2-week	0.0002	0.0001	0.0001	0.0000		0.0002		0.0015		0.0013		0.0013
Bismuth (Bi)-Dissolved	mg/m2-week	0.0008	0.0007	0.0004	0.0002		0.0008		0.0074		0.0067		0.0063
Boron (B)-Dissolved	mg/m2-week	2.7	0.4779	1.5	3.0		3.8		6.4		1.5		7.1
Cadmium (Cd)-Dissolved	mg/m2-week	-0.0001	0.0003	0.0018	-0.0014		0.0000		0.0009		-0.0003		0.0001
Calcium (Ca)-Dissolved	mg/m2-week	728	282	1135	1213		283		2262		508		1065
Chromium (Cr)-Dissolved	mg/m2-week	0.0108	0.0012	-0.0162	0.0001		-0.0054		-0.0009		0.0013		0.0013
Cobalt (Co)-Dissolved	mg/m2-week	0.0039	0.0005	0.0010	0.0041		-0.0008		0.0049		0.0033		-0.0033
Copper (Cu)-Dissolved	mg/m2-week	0.0016	0.0432	0.0233	0.0292		-0.0229		0.0050		0.0022		0.0029
Iron (Fe)-Dissolved	mg/m2-week	0.0162	0.0133	0.0090	0.0041		0.0168		0.1481		0.1333		0.1261
Lead (Pb)-Dissolved	mg/m2-week	-0.0034	0.0019	0.0018	0.0081		-0.0052		0.0004		0.0755		-0.0357
Lithium (Li)-Dissolved	mg/m2-week	0.3724	0.1278	-0.3008	0.2988		0.6159		1.0		0.1234		0.5476
Magnesium (Mg)-Dissolved	mg/m2-week	1093	701	1084	1953		672		3024		1592		1606
Manganese (Mn)-Dissolved	mg/m2-week	0.0359	0.1506	0.2343	0.5586		0.0425		0.6914		0.4288		-0.4255
Molybdenum (Mo)-Dissolved	mg/m2-week	-0.0575	0.0649	0.4501	0.3632		0.1112		0.8229		0.1855		0.4289
Nickel (Ni)-Dissolved	mg/m2-week	0.1501	-0.0833	-0.0611	0.0090		0.0102		0.0030		-0.0042		0.0229
Phosphorus (P)-Dissolved	mg/m2-week	0.4870	0.4000	0.2696	0.1217		0.5044		4.4		4.0		3.8
Potassium (K)-Dissolved	mg/m2-week	649	781	794	972		321		2124		1361		1159
Selenium (Se)-Dissolved	mg/m2-week	0.0119	0.0125	0.0091	0.0291		0.0116		0.0269		0.0188		0.0150
Silicon (Si)-Dissolved	mg/m2-week	21	1.1	20	16		15		56		42		41
Silver (Ag)-Dissolved	mg/m2-week	0.0011	-0.0010	0.0000	0.0000		0.0000		0.0001		0.0002		0.0001
Sodium (Na)-Dissolved	mg/m2-week	69	89	-3.7692	97		23		206		93		79
Strontium (Sr)-Dissolved	mg/m2-week	-1.1361	8.0	11	8.7		0.2050		22		2.9		7.7
Sulfur (S)-Dissolved	mg/m2-week	1491	3345	1661	4230		1501		5035		3417		3054
Thallium (Tl)-Dissolved	mg/m2-week	0.0027	0.0026	0.0056	0.0049		0.0021		0.0115		0.0052		0.0088
Tin (Sn)-Dissolved	mg/m2-week	0.0002	0.0001	0.0001	0.0000		0.0002		0.0015		0.0013		0.0013
Titanium (Ti)-Dissolved	mg/m2-week	0.0162	0.0133	0.0090	0.0041		0.0168		0.1481		0.1333		0.1261
Uranium (U)-Dissolved	mg/m2-week	-6.5415	27	7.8	18		-4.8126		16		-2.0674		2.3
Vanadium (V)-Dissolved	mg/m2-week	0.0016	0.0013	0.0009	0.0004		0.0017		0.0148		0.0133		0.0126
Zinc (Zn)-Dissolved	mg/m2-week	-0.0473	0.0720	-0.0824	0.4634		-0.2308		0.0388		0.0591		0.0459
Sulphate (calculated)	mg/m2-week	4473	10035	4984	12690		4502		15105		10252		9163

Note:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

Layered Tailings and Type 1 Mine Rock Column Testing - Loadings - Column A

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	Column A	Column A	Column A	Column A	Column A	Column A
Day		166	173	180	187	194	201
Week		23.7	24.7	25.7	26.7	27.7	28.7
Aluminum (Al)-Dissolved	mg/m2-week		0.2612		0.0838		0.1646
Antimony (Sb)-Dissolved	mg/m2-week		0.0013		0.0013		0.0016
Arsenic (As)-Dissolved	mg/m2-week		0.0289		0.0298		0.0320
Barium (Ba)-Dissolved	mg/m2-week		0.4604		0.4619		0.4209
Beryllium (Be)-Dissolved	mg/m2-week		0.0013		0.0013		0.0016
Bismuth (Bi)-Dissolved	mg/m2-week		0.0063		0.0067		0.0078
Boron (B)-Dissolved	mg/m2-week		3.6		5.7		3.6
Cadmium (Cd)-Dissolved	mg/m2-week		0.0001		0.0001		0.0002
Calcium (Ca)-Dissolved	mg/m2-week		1042		1056		824
Chromium (Cr)-Dissolved	mg/m2-week		0.0013		0.0013		0.0016
Cobalt (Co)-Dissolved	mg/m2-week		0.0013		0.0013		0.0016
Copper (Cu)-Dissolved	mg/m2-week		0.0088		0.0015		0.0131
Iron (Fe)-Dissolved	mg/m2-week		0.1252		0.1333		0.1565
Lead (Pb)-Dissolved	mg/m2-week		0.0044		0.0000		0.0156
Lithium (Li)-Dissolved	mg/m2-week		0.5800		0.5067		0.3415
Magnesium (Mg)-Dissolved	mg/m2-week		1882		1638		1471
Manganese (Mn)-Dissolved	mg/m2-week		-0.0058		0.0190		0.0199
Molybdenum (Mo)-Dissolved	mg/m2-week		0.5274		0.4474		0.3821
Nickel (Ni)-Dissolved	mg/m2-week		-0.0023		0.0067		0.0078
Phosphorus (P)-Dissolved	mg/m2-week		3.8		4.0		4.7
Potassium (K)-Dissolved	mg/m2-week		1581		1189		1081
Selenium (Se)-Dissolved	mg/m2-week		0.0197		0.0194		0.0157
Silicon (Si)-Dissolved	mg/m2-week		44		41		34
Silver (Ag)-Dissolved	mg/m2-week		0.0001		0.0001		0.0003
Sodium (Na)-Dissolved	mg/m2-week		96		82		66
Strontium (Sr)-Dissolved	mg/m2-week		7.3		7.3		5.4
Sulfur (S)-Dissolved	mg/m2-week		3061		2818		2893
Thallium (Tl)-Dissolved	mg/m2-week		0.0067		0.0074		0.0059
Tin (Sn)-Dissolved	mg/m2-week		0.0013		0.0013		0.0016
Titanium (Ti)-Dissolved	mg/m2-week		0.1252		0.1333		0.1565
Uranium (U)-Dissolved	mg/m2-week		1.9		2.3		1.4
Vanadium (V)-Dissolved	mg/m2-week		0.0125		0.0133		0.0157
Zinc (Zn)-Dissolved	mg/m2-week		0.0076		-0.0214		-0.0059
Sulphate (calculated)	mg/m2-week		9184		8455		8680

Note:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

ATTACHMENT B-4

Layered Column B – Mass Flux Summary

Layered Tailings and Type 1 Mine Rock Column Testing - Loadings - Column B

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter	Units	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B	Column B
Day		0	5	12	19	26	33	40	47	54	61	68
Week		0.0	0.7	1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7
Aluminum (Al)-Dissolved	mg/m2-week	N/A	7.5	-4.6	1.0	-0.9075	0.0643	-0.2313	0.1104	-0.1085	0.0845	-0.0500
Antimony (Sb)-Dissolved	mg/m2-week	N/A	0.0049	0.0002	0.0000	0.0002	0.0002	0.0002	0.0001	-0.0004	0.0002	0.0002
Arsenic (As)-Dissolved	mg/m2-week	N/A	0.5711	-0.3753	0.0035	0.0009	0.0000	-0.0007	0.0004	0.0028	0.0108	-0.0106
Barium (Ba)-Dissolved	mg/m2-week	N/A	0.1438	0.0363	0.2094	0.2591	0.2574	0.2943	0.2318	0.7134	0.5660	0.3877
Beryllium (Be)-Dissolved	mg/m2-week	N/A	0.0049	0.0002	0.0000	0.0002	0.0002	0.0002	0.0001	-0.0004	0.0002	0.0002
Bismuth (Bi)-Dissolved	mg/m2-week	N/A	0.0247	0.0010	-0.0001	0.0011	0.0008	0.0009	0.0003	-0.0018	0.0011	0.0011
Boron (B)-Dissolved	mg/m2-week	N/A	3.2	4.4	2.9	1.4	2.5	1.2	1.1	2.0	3.6	-0.2574
Cadmium (Cd)-Dissolved	mg/m2-week	N/A	0.0005	0.0008	0.0004	-0.0005	0.0012	-0.0010	0.0000	-0.0005	0.0007	-0.0004
Calcium (Ca)-Dissolved	mg/m2-week	N/A	317	185	614	884	975	838	575	1312	1896	50
Chromium (Cr)-Dissolved	mg/m2-week	N/A	0.0049	0.0002	0.0000	0.0002	0.0307	-0.0007	0.0006	-0.0045	-0.0196	0.0002
Cobalt (Co)-Dissolved	mg/m2-week	N/A	0.0267	0.0039	0.0072	0.0049	0.0032	0.0020	0.0014	0.0039	0.0018	-0.0027
Copper (Cu)-Dissolved	mg/m2-week	N/A	0.0711	0.0340	0.0134	0.0042	-0.0331	0.0024	0.0048	-0.0082	0.0478	-0.0163
Iron (Fe)-Dissolved	mg/m2-week	N/A	0.4941	0.0203	-0.0029	0.0214	0.0151	0.0180	0.0067	-0.0354	0.0217	0.0212
Lead (Pb)-Dissolved	mg/m2-week	N/A	0.0025	0.0001	0.0055	-0.0029	0.0086	-0.0068	0.0000	0.0011	0.0044	0.0085
Lithium (Li)-Dissolved	mg/m2-week	N/A	0.8774	0.8879	0.7662	0.7457	0.5165	0.9149	0.3348	0.2438	1.5	-0.3721
Magnesium (Mg)-Dissolved	mg/m2-week	N/A	213	67	309	419	483	397	238	689	572	574
Manganese (Mn)-Dissolved	mg/m2-week	N/A	0.1303	-0.0706	-0.0071	0.0148	-0.0083	-0.0021	0.0303	0.0618	0.0524	-0.0203
Molybdenum (Mo)-Dissolved	mg/m2-week	N/A	1.5	2.8	0.5247	0.5536	0.0305	0.3690	-0.0359	0.3407	0.5286	-0.4501
Nickel (Ni)-Dissolved	mg/m2-week	N/A	0.0514	-0.0007	0.0815	-0.0261	0.0191	-0.0012	0.0193	-0.0244	-0.0049	-0.0086
Phosphorus (P)-Dissolved	mg/m2-week	N/A	15	0.6087	-0.0870	0.6435	0.4522	0.5391	0.2000	-1.1	0.6522	0.6348
Potassium (K)-Dissolved	mg/m2-week	N/A	357	175	199	236	317	178	231	148	507	555
Selenium (Se)-Dissolved	mg/m2-week	N/A	0.0227	0.0179	0.0075	0.0065	0.0108	0.0025	0.0090	0.0030	0.0179	0.0059
Silicon (Si)-Dissolved	mg/m2-week	N/A	97	65	39	49	47	25	18	10	25	10
Silver (Ag)-Dissolved	mg/m2-week	N/A	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0443
Sodium (Na)-Dissolved	mg/m2-week	N/A	272	195	145	126	165	94	55	30	123	106
Strontium (Sr)-Dissolved	mg/m2-week	N/A	2.9	1.7	4.9	7.4	10	6.0	6.8	13	15	4.0
Sulfur (S)-Dissolved	mg/m2-week	N/A	489	-59	690	985	1110	1017	728	2057	1610	957
Thallium (Tl)-Dissolved	mg/m2-week	N/A	0.0013	0.0018	0.0011	0.0009	0.0025	0.0008	0.0015	0.0026	0.0032	0.0007
Tin (Sn)-Dissolved	mg/m2-week	N/A	0.0049	0.0002	0.0000	0.0002	0.0002	0.0002	0.0001	-0.0004	0.0002	0.0002
Titanium (Ti)-Dissolved	mg/m2-week	N/A	0.4941	0.0203	-0.0029	0.0214	0.0151	0.0180	0.0067	-0.0354	0.0217	0.0212
Uranium (U)-Dissolved	mg/m2-week	N/A	0.3295	0.4363	2.1	4.7	5.4	-0.5615	15	4.5	12	6.6
Vanadium (V)-Dissolved	mg/m2-week	N/A	0.0494	0.0232	-0.0134	0.0027	-0.0050	0.0018	0.0007	-0.0035	0.0022	0.0021
Zinc (Zn)-Dissolved	mg/m2-week	N/A	0.1383	0.2174	-0.2008	0.0197	0.2899	-0.2487	0.1198	-0.1472	0.0055	0.0056
Sulphate (calculated)	mg/m2-week	N/A	1467	-177	2070	2954	3331	3052	2184	6170	4830	2872

Note:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

Layered Tailings and Type 1 Mine Rock Column Testing - Loadings - Column B

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter / Day / Week	Units	Column B 75 10.7	Column B 82 11.7	Column B 89 12.7	Column B 96 13.7	Column B 103 14.7	Column B 110 15.7	Column B 117 16.7	Column B 124 17.7	Column B 131 18.7	Column B 138 19.7	Column B 145 20.7	Column B 152 21.7
Aluminum (Al)-Dissolved	mg/m2-week	0.1267	-0.0997	0.3786	-0.1618	5.1		-2.5		0.3207		0.0279	
Antimony (Sb)-Dissolved	mg/m2-week	0.0001	0.0002	0.0002	0.0002	0.0001		0.0001		0.0014		0.0014	
Arsenic (As)-Dissolved	mg/m2-week	0.0033	0.0009	-0.0020	-0.0014	0.0065		-0.0025		0.0031		0.0009	
Barium (Ba)-Dissolved	mg/m2-week	0.9146	0.3703	0.5758	1.1	0.5497		0.7006		1.7		0.7966	
Beryllium (Be)-Dissolved	mg/m2-week	0.0001	0.0002	0.0002	0.0002	0.0001		0.0001		0.0014		0.0014	
Bismuth (Bi)-Dissolved	mg/m2-week	0.0006	0.0009	0.0008	0.0009	0.0003		0.0007		0.0068		0.0069	
Boron (B)-Dissolved	mg/m2-week	3.1	1.8	0.6682	-0.3308	2.0		3.2		4.7		1.6	
Cadmium (Cd)-Dissolved	mg/m2-week	0.0004	-0.0004	0.0001	0.0022	-0.0017		0.0001		0.0009		-0.0002	
Calcium (Ca)-Dissolved	mg/m2-week	1382	605	432	1092	1033		460		2313		787	
Chromium (Cr)-Dissolved	mg/m2-week	0.0208	0.0043	0.0106	-0.0173	0.0027		0.0010		-0.0032		0.0014	
Cobalt (Co)-Dissolved	mg/m2-week	0.0003	0.0011	0.0016	0.0010	0.0011		-0.0001		0.0035		-0.0001	
Copper (Cu)-Dissolved	mg/m2-week	-0.0177	-0.0027	0.0036	0.0361	0.0292		-0.0006		-0.0024		0.0030	
Iron (Fe)-Dissolved	mg/m2-week	0.0125	0.0174	0.0157	0.0188	0.0067		0.0142		0.1368		0.1388	
Lead (Pb)-Dissolved	mg/m2-week	-0.0125	-0.0011	0.0022	0.0014	0.0028		-0.0016		0.0010		0.0185	
Lithium (Li)-Dissolved	mg/m2-week	0.7554	0.2971	0.2443	-0.3397	0.2921		0.5759		1.1		0.2044	
Magnesium (Mg)-Dissolved	mg/m2-week	641	601	399	504	792		566		1923		938	
Manganese (Mn)-Dissolved	mg/m2-week	0.0916	0.0368	0.0190	0.1183	0.2348		0.0598		0.3526		0.2958	
Molybdenum (Mo)-Dissolved	mg/m2-week	0.1732	-0.0729	-0.0854	0.3708	0.0520		0.0850		0.7225		0.2163	
Nickel (Ni)-Dissolved	mg/m2-week	0.0311	-0.0088	0.0017	0.0006	0.0037		0.0062		-0.0006		0.0035	
Phosphorus (P)-Dissolved	mg/m2-week	0.3739	0.5217	0.4696	0.5652	0.2000		0.4261		4.1		4.2	
Potassium (K)-Dissolved	mg/m2-week	346	336	430	487	533		352		1435		984	
Selenium (Se)-Dissolved	mg/m2-week	0.0111	0.0115	0.0009	0.0094	0.0126		0.0135		0.0194		0.0138	
Silicon (Si)-Dissolved	mg/m2-week	50	28	-1.9	16	20		19		65		45	
Silver (Ag)-Dissolved	mg/m2-week	-0.0416	0.0072	-0.0067	0.0003	-0.0003		0.0000		0.0001		0.0001	
Sodium (Na)-Dissolved	mg/m2-week	80	61	104	-15	53		49		187		85	
Strontium (Sr)-Dissolved	mg/m2-week	13	2.2	6.4	13	7.4		3.2		24		6.7	
Sulfur (S)-Dissolved	mg/m2-week	1349	1125	2012	612	3219		1012		3872		2327	
Thallium (Tl)-Dissolved	mg/m2-week	0.0036	0.0024	0.0018	0.0023	0.0027		0.0023		0.0084		0.0052	
Tin (Sn)-Dissolved	mg/m2-week	0.0001	0.0002	0.0002	0.0002	0.0001		0.0001		0.0014		0.0014	
Titanium (Ti)-Dissolved	mg/m2-week	0.0125	0.0174	0.0157	0.0188	0.0067		0.0142		0.1368		0.1388	
Uranium (U)-Dissolved	mg/m2-week	-1.8	1.9	22	7.7	14		-1.9		18		-0.8254	
Vanadium (V)-Dissolved	mg/m2-week	0.0012	0.0017	0.0016	0.0019	0.0007		0.0014		0.0137		0.0139	
Zinc (Zn)-Dissolved	mg/m2-week	0.0032	0.0672	-0.0547	0.0051	0.3529		-0.1351		0.0460		-0.0453	
Sulphate (calculated)	mg/m2-week	4046	3374	6035	1835	9657		3037		11616		6982	

Note:

1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

Layered Tailings and Type 1 Mine Rock Column Testing - Loadings - Column B

Volume of Overlying Water	1.44	L
Tailings Mass	2.041	kg
Type 1 Mine Rock Mass	1.400	kg
Surface Area	0.017	m^2

Parameter / Day / Week	Units	Column B 159 22.7	Column B 166 23.7	Column B 173 24.7	Column B 180 25.7	Column B 187 26.7	Column B 194 27.7	Column B 201 28.7
Aluminum (Al)-Dissolved	mg/m2-week	0.2746		0.1227		0.6960		-0.1823
Antimony (Sb)-Dissolved	mg/m2-week	0.0013		0.0014		0.0013		0.0015
Arsenic (As)-Dissolved	mg/m2-week	0.0048		0.0066		-0.0009		0.0018
Barium (Ba)-Dissolved	mg/m2-week	0.7522		0.7838		0.7290		0.5773
Beryllium (Be)-Dissolved	mg/m2-week	0.0013		0.0014		0.0013		0.0015
Bismuth (Bi)-Dissolved	mg/m2-week	0.0067		0.0069		0.0066		0.0075
Boron (B)-Dissolved	mg/m2-week	4.2		3.0		4.1		2.7
Cadmium (Cd)-Dissolved	mg/m2-week	0.0001		0.0001		0.0001		0.0001
Calcium (Ca)-Dissolved	mg/m2-week	1002		1169		1127		860
Chromium (Cr)-Dissolved	mg/m2-week	0.0013		0.0014		0.0023		0.0011
Cobalt (Co)-Dissolved	mg/m2-week	0.0005		0.0014		0.0013		0.0015
Copper (Cu)-Dissolved	mg/m2-week	0.0079		0.0113		0.0080		0.0062
Iron (Fe)-Dissolved	mg/m2-week	0.1336		0.1380		0.1316		0.1493
Lead (Pb)-Dissolved	mg/m2-week	-0.0070		0.0026		0.0028		0.0068
Lithium (Li)-Dissolved	mg/m2-week	0.4639		0.5763		0.4889		0.3460
Magnesium (Mg)-Dissolved	mg/m2-week	1032		1274		1224		1078
Manganese (Mn)-Dissolved	mg/m2-week	0.3221		0.2740		0.0713		0.0566
Molybdenum (Mo)-Dissolved	mg/m2-week	0.2882		0.4233		0.3691		0.3110
Nickel (Ni)-Dissolved	mg/m2-week	0.0067		0.0069		0.0066		0.0075
Phosphorus (P)-Dissolved	mg/m2-week	4.0		4.1		3.9		4.5
Potassium (K)-Dissolved	mg/m2-week	921		1116		1081		830
Selenium (Se)-Dissolved	mg/m2-week	0.0093		0.0121		0.0114		0.0075
Silicon (Si)-Dissolved	mg/m2-week	45		45		47		38
Silver (Ag)-Dissolved	mg/m2-week	0.0008		-0.0001		0.0001		0.0001
Sodium (Na)-Dissolved	mg/m2-week	81		100		81		61
Strontium (Sr)-Dissolved	mg/m2-week	8.0		10		9.5		7.1
Sulfur (S)-Dissolved	mg/m2-week	2108		2466		2317		2291
Thallium (Tl)-Dissolved	mg/m2-week	0.0061		0.0056		0.0066		0.0053
Tin (Sn)-Dissolved	mg/m2-week	0.0013		0.0014		0.0013		0.0015
Titanium (Ti)-Dissolved	mg/m2-week	0.1336		0.1380		0.1316		0.1493
Uranium (U)-Dissolved	mg/m2-week	1.6		3.3		3.0		1.9
Vanadium (V)-Dissolved	mg/m2-week	0.0134		0.0138		0.0132		0.0149
Zinc (Zn)-Dissolved	mg/m2-week	0.0095		0.0782		0.1710		-0.1026
Sulphate (calculated)	mg/m2-week	6323		7399		6952		6872

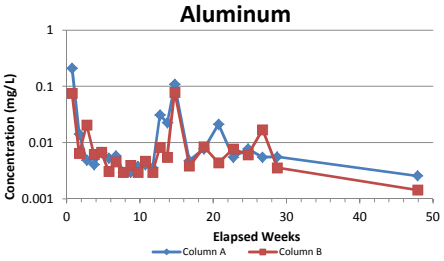
Note:

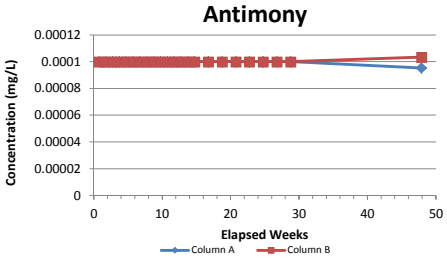
1) De-ionized water concentrations used for sampling water replacement and evaporation replacement are from a laboratory blank in August 2012. For this blank, when the concentration was measured below the detection limit, half the detection limit value was used as a representative concentration.

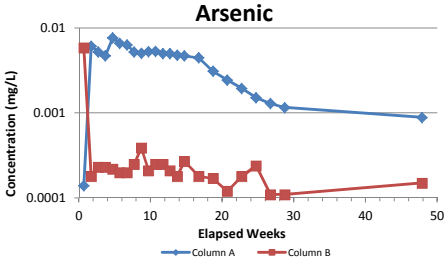
ATTACHMENT B-5

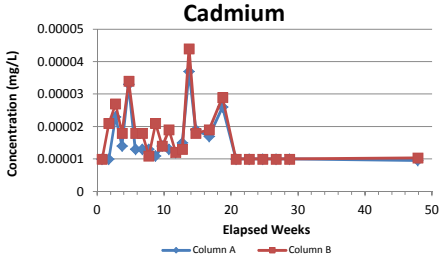
Layered Column A and B – Concentration Plots

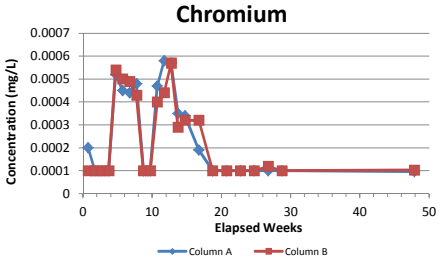
Layered Tailings and Type 1 Mine Rock Column Testing - Concentrations

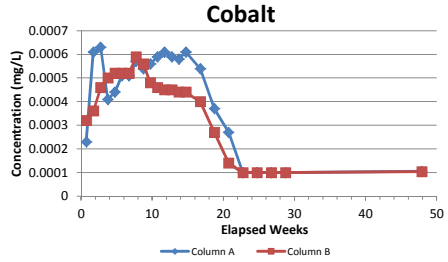


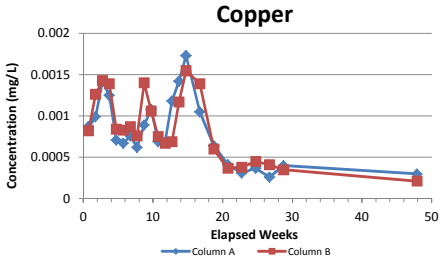


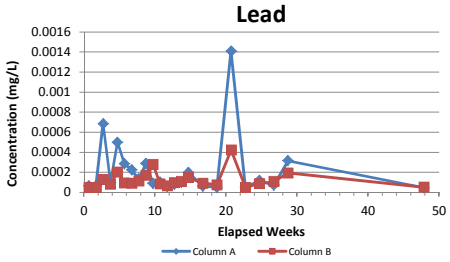


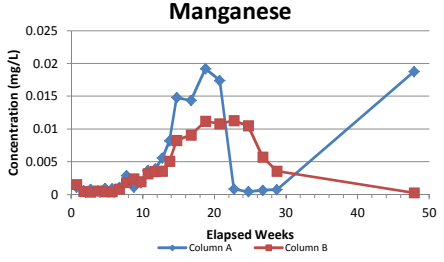


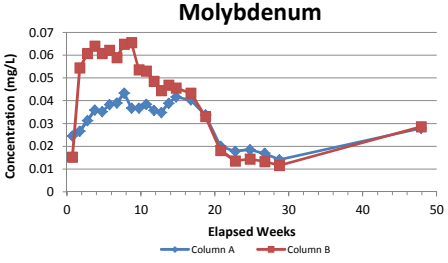


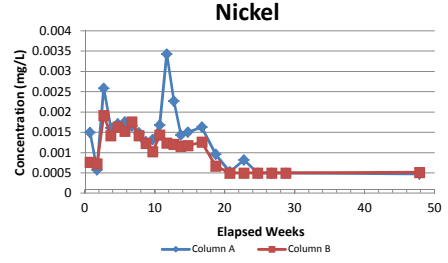


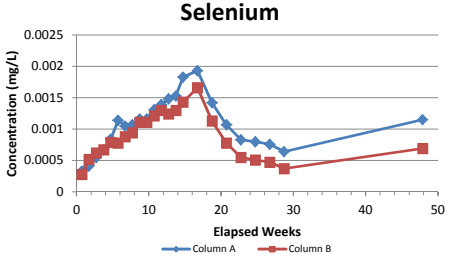


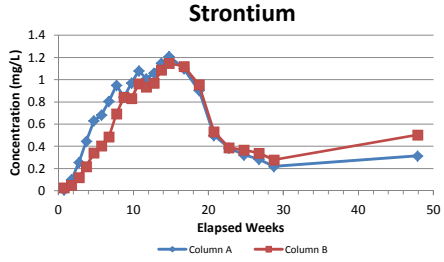


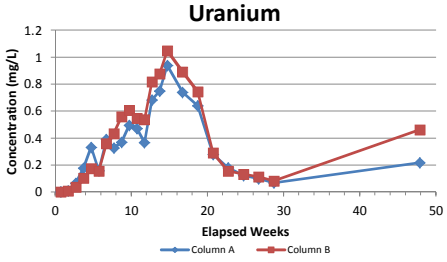


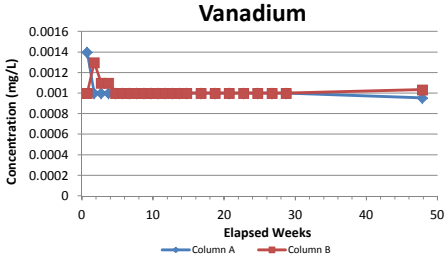


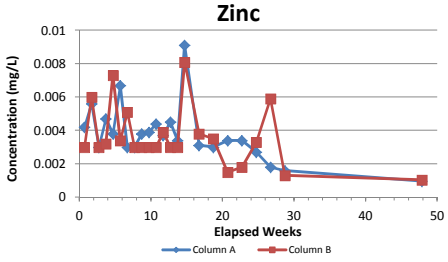


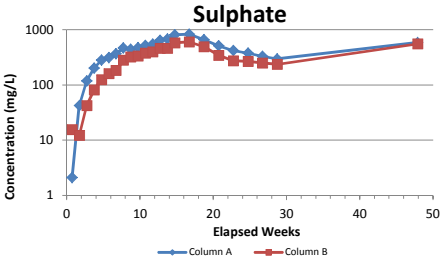


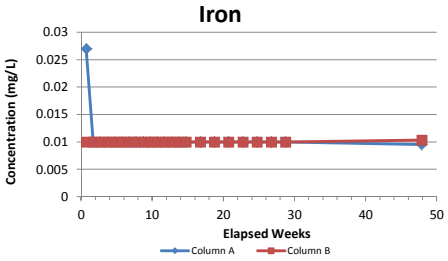










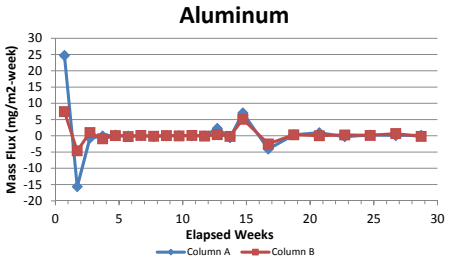


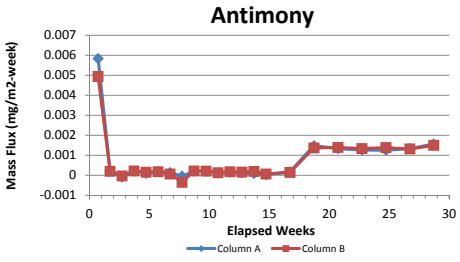
Note: Aluminum, Arsenic, and Sulphate are shown with logarithmic y-axes.

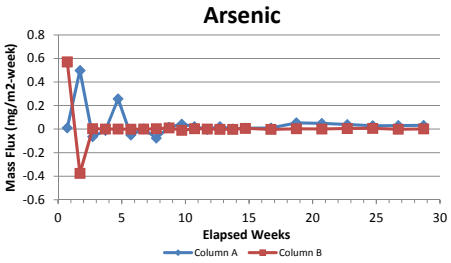
ATTACHMENT B-6

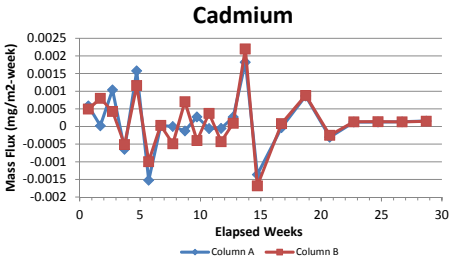
Layered Column A and B – Loading Rate Plots

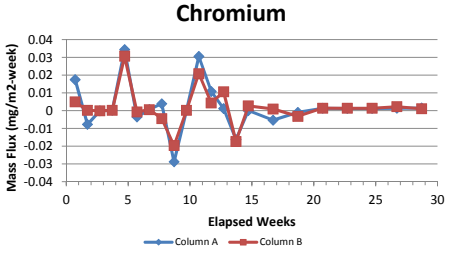
Layered Tailings and Type 1 Mine Rock Column Testing - Loadings

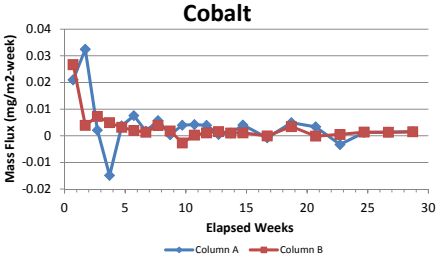


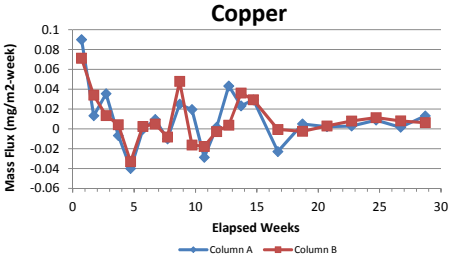


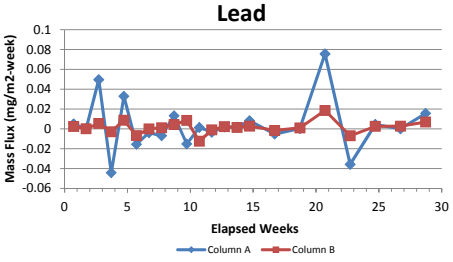


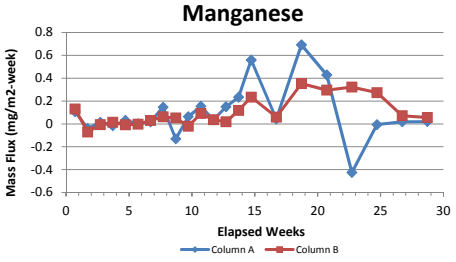


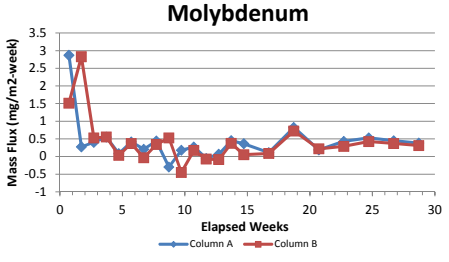


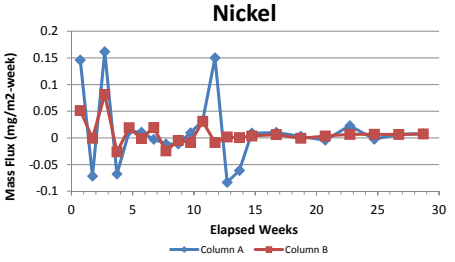


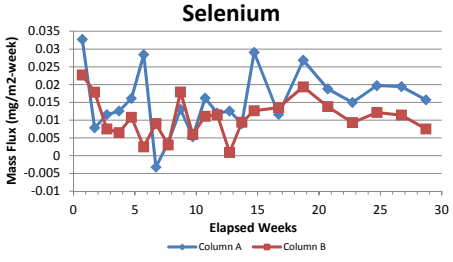


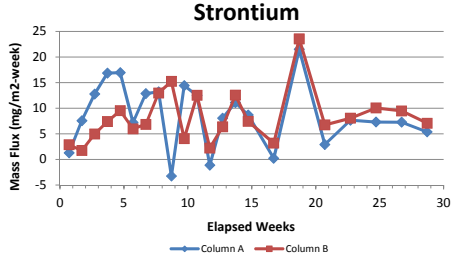


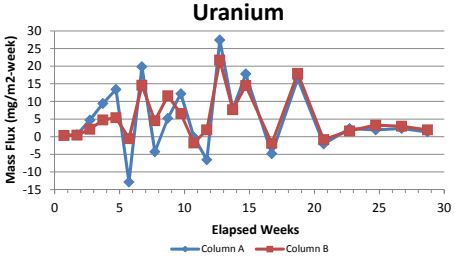


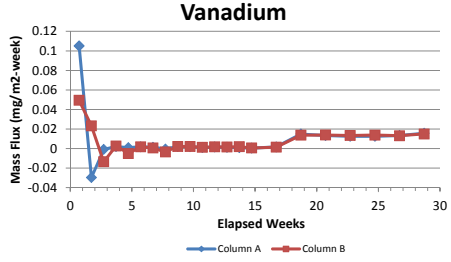


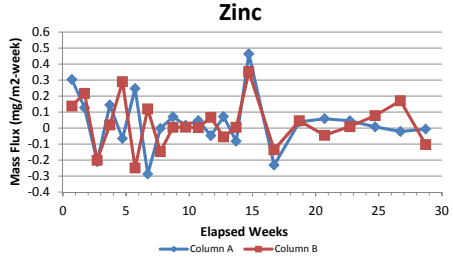


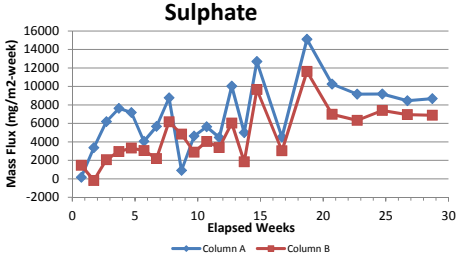


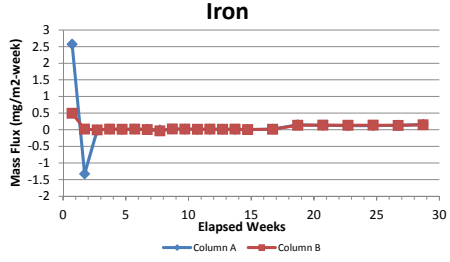












ATTACHMENT B-7

Layered Column A and B – Decommissioning Results

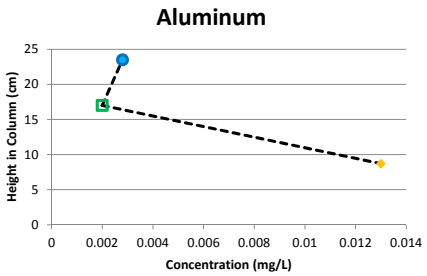
Layered Tailings and Type 1 Mine Rock Column Testing - Week 48 Results

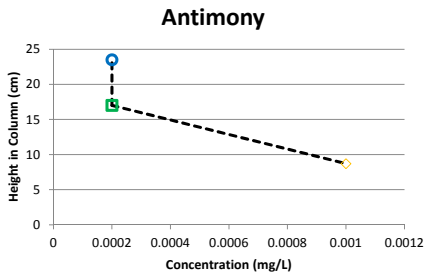
Sample ID	COL A- PW PORT 2	COL B- PW PORT 2	COL B- PW PORT 1	COL A	COL B
	Tailings		Type 1 Mine Rock	Overlying Water	
Date Sampled	23-NOV-12	23-NOV-12	22-NOV-12	22-NOV-12	22-NOV-12
Time Sampled	00:00	00:00	00:00	00:00	00:00
ALS Sample ID	L1241423-2	L1241423-5	L1241423-4	L1241423-1	L1241423-3
Matrix	Water	Water	Water	Water	Water
Units	mg/L	mg/L	mg/L	mg/L	mg/L
Dissolved Metals					
Aluminum (Al)-Dissolved	<0.005	0.013	<0.002	0.0054	0.0028
Antimony (Sb)-Dissolved	<0.0005	<0.001	<0.0002	<0.0002	<0.0002
Arsenic (As)-Dissolved	0.00186	0.0022	0.00029	0.00186	0.00029
Barium (Ba)-Dissolved	0.0316	0.0326	0.0811	0.0531	0.115
Beryllium (Be)-Dissolved	<0.0005	<0.001	<0.0002	<0.0002	<0.0002
Bismuth (Bi)-Dissolved	<0.0025	<0.005	<0.001	<0.001	<0.001
Boron (B)-Dissolved	1.76	2.00	0.540	0.530	0.442
Cadmium (Cd)-Dissolved	0.000119	0.00013	<0.00002	<0.00002	<0.00002
Calcium (Ca)-Dissolved	463	482	165	122	137
Chromium (Cr)-Dissolved	<0.0005	<0.001	<0.0002	<0.0002	<0.0002
Cobalt (Co)-Dissolved	0.00426	0.0052	<0.0002	0.00022	<0.0002
Copper (Cu)-Dissolved	0.0075	0.0087	0.00044	0.00063	0.00041
Iron (Fe)-Dissolved	<0.05	<0.1	<0.02	<0.02	<0.02
Lead (Pb)-Dissolved	0.00047	0.00157	<0.0001	<0.0001	<0.0001
Lithium (Li)-Dissolved	0.167	0.165	0.0749	0.0574	0.0629
Magnesium (Mg)-Dissolved	930	1200	286	244	244
Manganese (Mn)-Dissolved	3.53	4.42	0.0271	0.0394	0.00054
Molybdenum (Mo)-Dissolved	0.298	0.353	0.0704	0.0587	0.0555
Nickel (Ni)-Dissolved	0.0033	<0.005	<0.001	<0.001	<0.001
Phosphorus (P)-Dissolved	<1.5	<3.0	<0.6	<0.6	<0.6
Potassium (K)-Dissolved	195	253	116	110	109
Selenium (Se)-Dissolved	0.0113	0.0081	0.00147	0.00241	0.00134
Silicon (Si)-Dissolved	6.55	6.60	3.75	2.95	3.08
Silver (Ag)-Dissolved	<0.00005	<0.0001	<0.00002	0.000024	<0.00002
Sodium (Na)-Dissolved	20.4	30.5	12.8	9.73	11.5
Strontium (Sr)-Dissolved	1.66	1.69	1.12	0.661	0.974
Sulfur (S)-Dissolved	1540	1830	426	413	362
Thallium (Tl)-Dissolved	0.00108	0.00123	0.000642	0.000544	0.000558
Tin (Sn)-Dissolved	<0.0005	<0.001	<0.0002	<0.0002	<0.0002
Titanium (Ti)-Dissolved	<0.05	<0.1	<0.02	<0.02	<0.02
Uranium (U)-Dissolved	0.133	0.128	0.945	0.457	0.898
Vanadium (V)-Dissolved	0.116	0.111	<0.002	<0.002	<0.002
Zinc (Zn)-Dissolved	0.0578	0.090	0.0072	<0.002	<0.002
Sulphate (Calculated)	4620	5490	1278	1239	1086

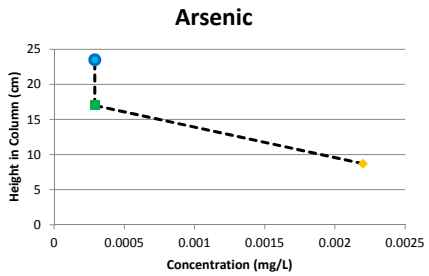
ATTACHMENT B-8

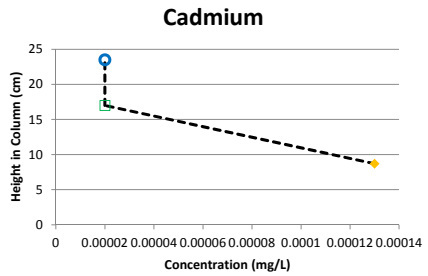
Layered Column B – Decommissioning Plots

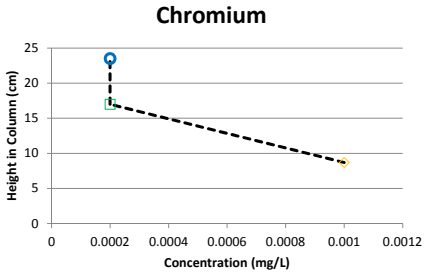
Layered Column B – Decommissioning Plots

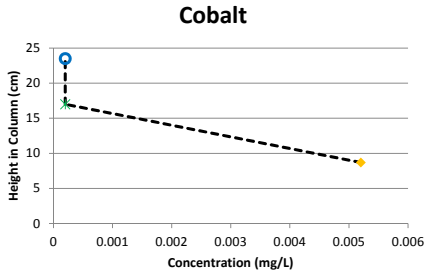


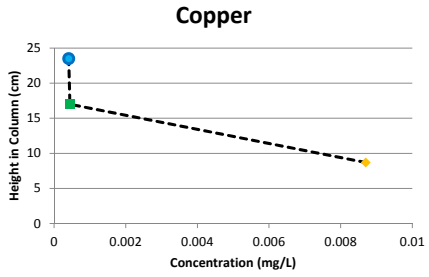


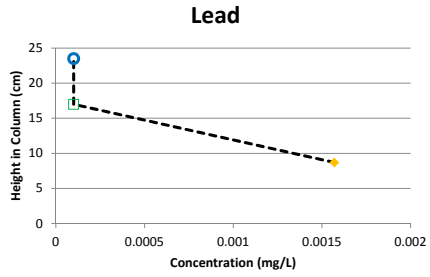


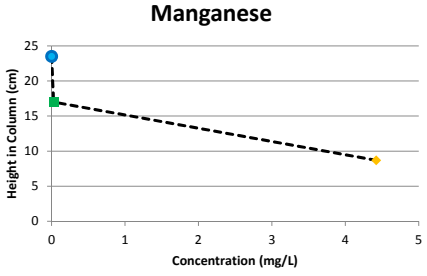


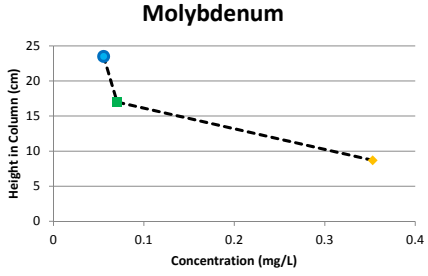


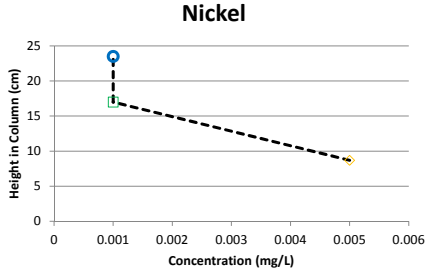


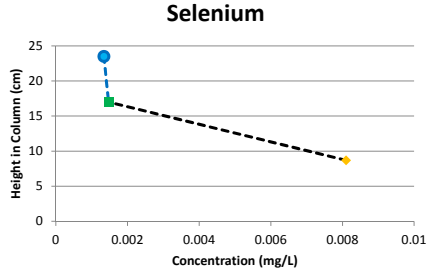


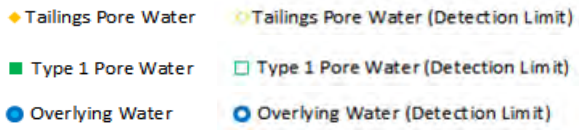


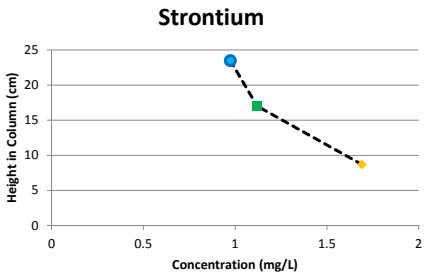


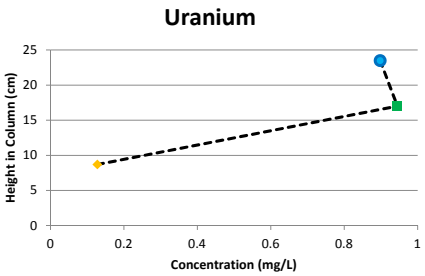


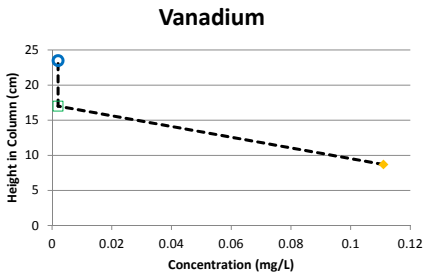


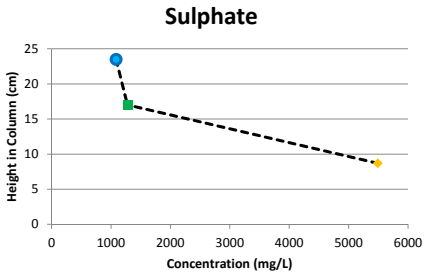


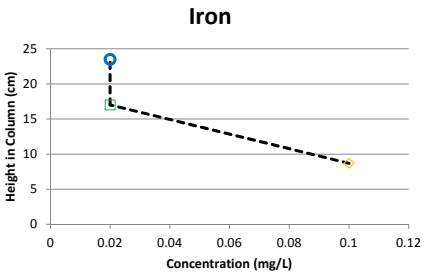


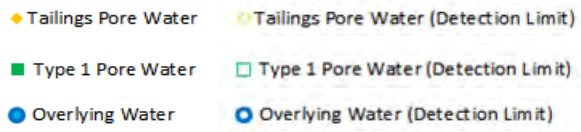

Strontium
Height in Column (cm)
Concentration (mg/L)


Uranium
Height in Column (cm)
Concentration (mg/L)


Vanadium
Height in Column (cm)
Concentration (mg/L)


Sulphate
Height in Column (cm)
Concentration (mg/L)


Iron
Height in Column (cm)
Concentration (mg/L)


Tailings Pore Water
Tailings Pore Water (Detection Limit)
Type 1 Pore Water
Type 1 Pore Water (Detection Limit)
Overlying Water
Overlying Water (Detection Limit)

ATTACHMENT C-1

Humidity Cell – Concentration Summary

Humidity Cell Test Results

Parameter			MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250
Day			0	7	14	21	28	35	42	49	56	63	70	77
Week			0	1	2	3	4	5	6	7	8	9	10	11
	Units													
Mass Bottle	g	273.93												
Mass Bottle with Rock	g	1274.35												
Volume Water Added	L		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L		1.1	1.1	1.1	1.2	1.2	1.2	1.17	1.16	1.3	1.11	1.4	1.2
pH	---		4.56	5.91	3.06	6.49	5.78	7.63	7.52	7.55	7.12	7.15	6.92	7.42
Conductivity	mS		0.11	0.13	0.19	0.03	0.02	0.09	0.00	0.02	0.05	0.01	0.03	0.05
Acidity as CaC03	mg/L		7.8	5.6	30.8	2.4	4.0	2.2	-	2.4	<2	<2	2.6	10.4
Alkalinity	mg/L		-	-	-	-	-	-	11	-	-	-	-	-
Dissolved Aluminum (Al)	mg/L		0.048	0.04	<0.1	0.13	0.05	0.045	0.032	0.073	0.039	0.044	0.04	0.044
Dissolved Antimony (Sb)	mg/L		<0.0005	<0.0005	<0.05	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Arsenic (As)	mg/L		0.003	0.003	<0.01	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.001	0.002
Dissolved Barium (Ba)	mg/L		0.014	0.008	<0.1	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Beryllium (Be)	mg/L		<0.0005	<0.0005	<0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Bismuth (Bi)	mg/L		<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Boron (B)	mg/L		0.051	0.059	<0.5	0.027	0.021	0.02	0.018	0.017	0.016	0.01	0.011	<0.01
Dissolved Cadmium (Cd)	mg/L		<0.0001	<0.0001	0.0030	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Calcium (Ca)	mg/L		10	11	8.6	6.4	5.6	5.6	5.2	6.1	6.2	5.3	5.6	4.8
Dissolved Chromium (Cr)	mg/L		<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Cobalt (Co)	mg/L		0.015	0.0076	0.0100	0.0095	0.002	0.0013	0.0012	0.001	0.0011	0.0008	0.0008	0.0007
Dissolved Copper (Cu)	mg/L		0.006	0.003	<0.01	0.007	0.002	<0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001
Dissolved Iron (Fe)	mg/L		<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Lead (Pb)	mg/L		0.0008	0.0008	<0.01	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Magnesium (Mg)	mg/L		3.4	4	<5	2	1.7	1.7	1.5	1.6	1.6	1.3	1.4	1.2
Dissolved Manganese (Mn)	mg/L		0.017	0.011	0.012	0.009	0.004	0.003	0.003	0.003	0.003	<0.002	0.002	<0.002
Dissolved Molybdenum (Mo)	mg/L		0.36	1.1	0.955	0.53	0.32	0.38	0.28	0.31	0.36	0.22	0.26	0.13
Dissolved Nickel (Ni)	mg/L		0.016	0.007	<0.02	0.006	0.006	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Phosphorus (P)	mg/L		<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		5.3	4.5	<10	2.7	2.2	2.1	1.8	1.9	1.8	1.5	1.4	1.3
Dissolved Selenium (Se)	mg/L		0.006	0.012	<0.05	0.003	0.003	0.003	0.003	0.003	0.004	<0.002	0.002	<0.002
Dissolved Silicon (Si)	mg/L		0.84	1	<10	0.82	0.67	0.72	0.56	0.68	0.7	0.55	0.59	0.48
Dissolved Silver (Ag)	mg/L		<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Sodium (Na)	mg/L		6.9	5.2	<5	1.4	1.1	0.67	0.45	0.59	0.37	0.29	0.31	0.24
Dissolved Strontium (Sr)	mg/L		0.12	0.12	0.107	0.071	0.059	0.059	0.053	0.058	0.061	0.051	0.054	0.046
Dissolved Sulphur (S)	mg/L		10.1	10.5	<50	2.8	2.0	1.6	1.4	1.4	1.3	1.0	1.1	0.8
Dissolved Thallium (Tl)	mg/L		0.00011	0.00009	<0.003	0.00009	0.00005	0.00005	<0.00005	0.00005	0.00005	<0.00005	<0.00005	<0.00005
Dissolved Tin (Sn)	mg/L		0.002	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Titanium (Ti)	mg/L		<0.005	<0.005	<0.02	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dissolved Tungsten (W)	mg/L		0.006	0.009	<0.1	0.007	0.007	0.008	0.007	0.008	0.009	0.006	0.007	0.005
Dissolved Uranium (U)	mg/L		0.9	2.1	2.36	2.6	1.6	1.9	1.7	1.9	2.1	1.3	1.6	0.85
Dissolved Vanadium (V)	mg/L		0.008	0.005	<0.01	0.008	0.005	0.005	0.003	0.004	0.004	0.005	0.004	0.004
Dissolved Zinc (Zn)	mg/L		0.005	<0.005	<0.03	0.009	0.007	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	0.005
Dissolved Zirconium (Zr)	mg/L		<0.001	<0.001	<0.04	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate (SO4)	mg/L		30.3	31.5	<150	8.4	6	4.8	4.2	4.2	3.9	3	3.3	2.4

Humidity Cell Test Results

Parameter			MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250
Day			84	91	98	105	112	119	126	133	140	147	154	161	168	175
Week			12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Units															
Mass Bottle	g	273.93														
Mass Bottle with Rock	g	1274.35														
Volume Water Added	L		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L		1.1	1.3	1.25	1.14	1.25	1.27	1.22	1.19	1.3	1.23	1.29	1.15	1.2	1.35
pH	---		7.31	7.97	7.56	7.69	7.75	7.03	6.64	7.2	7.55	7.12	6.63	7.2	3.43	7.18
Conductivity	mS		0.03	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00
Acidity as CaC03	mg/L		<2	<2	<2	<2	<2	2.0	<2	2.2	<2	<2	<2	<2	4.8	<2
Alkalinity	mg/L		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Aluminum (Al)	mg/L		0.047	0.033	0.039	0.043	0.039	0.025	0.0423	0.0227	0.0306	0.0687	0.522	0.0357	0.0290	0.0263
Dissolved Antimony (Sb)	mg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Arsenic (As)	mg/L		0.001	0.001	0.001	0.002	0.001	<0.001	0.00105	0.00077	0.00098	0.00084	0.00076	0.00087	0.00108	0.00075
Dissolved Barium (Ba)	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00203	0.00206	0.00238	0.00225	0.00319	0.00214	0.00260	0.00221
Dissolved Beryllium (Be)	mg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Bismuth (Bi)	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Boron (B)	mg/L		<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
Dissolved Cadmium (Cd)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00001	0.000014	0.000021	0.000020	<0.00002	0.000015	<0.00003	<0.00003
Dissolved Calcium (Ca)	mg/L		4.8	5.3	4.7	4.1	5.2	4.7	4.08	3.74	5.06	4.28	5.67	4.63	5.57	4.53
Dissolved Chromium (Cr)	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.00012	0.00012	<0.0001	0.00013	0.00019	0.00014	0.00020	0.00015
Dissolved Cobalt (Co)	mg/L		0.0005	0.0007	0.0006	<0.0005	0.0006	0.0006	0.00049	0.00057	0.00056	0.00042	0.00046	0.00041	0.00072	0.00056
Dissolved Copper (Cu)	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.00099	0.00059	0.00066	0.00087	0.00093	0.00144	0.00091	0.00081
Dissolved Iron (Fe)	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Dissolved Lead (Pb)	mg/L		<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.000141	0.000071	0.000150	0.000188	0.000160	0.000279	0.000268	0.000095
Dissolved Magnesium (Mg)	mg/L		1.1	1.2	1.1	0.89	1.1	1	0.912	0.814	0.979	0.844	0.880	0.900	0.949	0.914
Dissolved Manganese (Mn)	mg/L		<0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.00183	0.00188	0.00235	0.00205	0.00411	0.00219	0.00290	0.00250
Dissolved Molybdenum (Mo)	mg/L		0.14	0.26	0.14	0.13	0.13	0.17	0.0650	0.0900	0.0994	0.0606	0.0550	0.0879	0.106	0.0935
Dissolved Nickel (Ni)	mg/L		0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.00077	0.00055	0.00069	0.00071	0.00062	<0.0005	0.00073	0.00083
Dissolved Phosphorus (P)	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Dissolved Potassium (K)	mg/L		1.2	1.1	0.91	0.85	0.95	0.76	0.711	0.550	0.667	0.745	0.765	0.616	0.618	0.561
Dissolved Selenium (Se)	mg/L		<0.002	0.002	<0.002	<0.002	<0.002	<0.002	0.00092	0.00081	0.00102	0.00092	0.00074	0.00090	0.00087	0.00077
Dissolved Silicon (Si)	mg/L		0.45	0.49	0.4	0.37	0.41	0.33	0.355	0.284	0.360	0.351	0.332	0.339	0.329	0.303
Dissolved Silver (Ag)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Dissolved Sodium (Na)	mg/L		0.25	0.23	0.15	0.19	0.18	0.12	0.187	0.116	0.141	0.244	0.640	0.190	0.211	0.161
Dissolved Strontium (Sr)	mg/L		0.043	0.049	0.041	0.035	0.044	0.04	0.0370	0.0335	0.0412	0.0338	0.0364	0.0371	0.0381	0.0360
Dissolved Sulphur (S)	mg/L		0.8	0.9	0.6	0.6	0.6	0.6	<0.5	<0.5	0.62	0.57	0.84	0.55	1.45	<0.5
Dissolved Thallium (Tl)	mg/L		<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Tin (Sn)	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Titanium (Ti)	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Tungsten (W)	mg/L		0.005	0.006	0.005	0.003	0.005	0.004	-	-	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L		1.2	1.6	1.2	0.72	1.4	1.5	0.936	0.984	1.29	0.958	1.04	1.04	1.40	1.27
Dissolved Vanadium (V)	mg/L		0.003	0.003	0.003	0.004	0.003	0.002	0.0026	0.0018	0.0024	0.0024	0.0020	0.0028	0.0021	0.0021
Dissolved Zinc (Zn)	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003	<0.003	0.0034	0.0128	<0.003	0.0036	<0.003
Dissolved Zirconium (Zr)	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-	-
Sulphate (SO4)	mg/L		2.4	2.7	1.8	1.8	1.8	1.8	<1.5	<1.5	1.86	1.71	2.52	1.65	4.35	<1.5

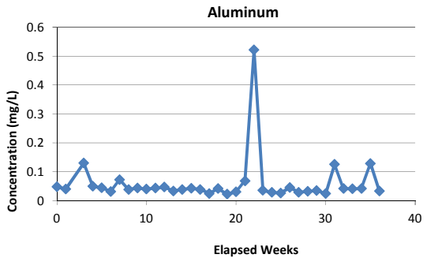
Humidity Cell Test Results

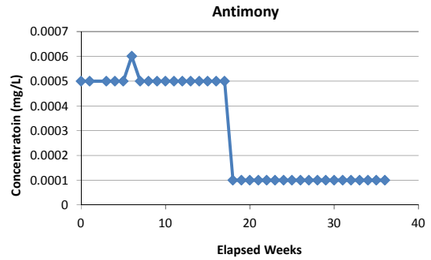
Parameter			MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250	MZ >250
Day			182	189	196	203	210	217	225	231	238	245	252
Week			26	27	28	29	30	31	32	33	34	35	36
	Units												
Mass Bottle	g	273.93											
Mass Bottle with Rock	g	1274.35											
Volume Water Added	L		1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Volume Water Recovered	L		1.2	1.3	1.3	1.26	1.24	1.27	1.28	1.23	1.28	1.26	1.26
pH	---		7.2	7.09	6.96	6.68	7.16	7.53	6.86	6.68	6.7	7.1	7.33
Conductivity	mS		0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Acidity as CaC03	mg/L		<2	3.4	2.2	3.5	<2	2.2	<2	<2	2.6	3.4	<2
Alkalinity	mg/L		-	-	-	-	-	-	-	-	-	-	-
Dissolved Aluminum (Al)	mg/L		0.0452	0.0286	0.0326	0.0348	0.0246	0.126	0.0422	0.0410	0.0417	0.129	0.0334
Dissolved Antimony (Sb)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Arsenic (As)	mg/L		0.00063	0.00076	0.00090	0.00082	0.00047	0.00073	0.00074	0.00055	0.00054	0.00042	0.00062
Dissolved Barium (Ba)	mg/L		0.00174	0.00218	0.00185	0.00199	0.00145	0.00232	0.00213	0.00168	0.00145	0.00121	0.00156
Dissolved Beryllium (Be)	mg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Bismuth (Bi)	mg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Dissolved Boron (B)	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Cadmium (Cd)	mg/L		0.000018	0.000013	0.000015	0.000018	<0.00001	0.000015	0.000010	<0.00001	<0.00001	<0.00001	<0.00001
Dissolved Calcium (Ca)	mg/L		3.56	4.45	3.94	4.61	3.07	4.37	5.05	3.13	4.70	3.69	4.08
Dissolved Chromium (Cr)	mg/L		0.00016	<0.0001	0.00013	0.00011	0.00011	0.00014	0.00013	0.00016	0.00014	0.00012	0.00025
Dissolved Cobalt (Co)	mg/L		0.00044	0.00049	0.00044	0.00050	0.00037	0.00030	0.00038	0.00030	0.00037	0.00031	0.00031
Dissolved Copper (Cu)	mg/L		0.00113	0.00054	0.00056	<0.0005	0.00069	0.00127	0.00058	<0.0005	0.00055	<0.0005	<0.0005
Dissolved Iron (Fe)	mg/L		<0.03	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Lead (Pb)	mg/L		0.000315	0.000102	0.000118	0.000151	0.000081	0.000223	0.000159	0.000063	0.000119	0.000087	0.000088
Dissolved Magnesium (Mg)	mg/L		0.652	0.881	0.764	0.771	0.542	0.693	0.785	0.576	0.705	0.570	0.629
Dissolved Manganese (Mn)	mg/L		0.00198	0.00227	0.00222	0.00323	0.00215	0.00255	0.00289	0.00234	0.00246	0.00260	0.00290
Dissolved Molybdenum (Mo)	mg/L		0.0441	0.0685	0.0775	0.0821	0.0415	0.0504	0.0686	0.0299	0.0555	0.0428	0.0363
Dissolved Nickel (Ni)	mg/L		0.00056	0.00135	0.00104	0.00059	0.00091	0.00069	0.00102	0.00167	0.00057	<0.0005	<0.0005
Dissolved Phosphorus (P)	mg/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Dissolved Potassium (K)	mg/L		0.490	0.541	0.437	0.429	0.338	0.410	0.439	0.364	0.335	0.364	0.386
Dissolved Selenium (Se)	mg/L		0.00063	0.00084	0.00075	0.00070	0.00051	0.00054	0.00065	0.00041	0.00056	0.00045	0.00054
Dissolved Silicon (Si)	mg/L		0.267	0.300	0.280	0.268	0.192	0.240	0.281	0.166	0.235	0.189	0.221
Dissolved Silver (Ag)	mg/L		<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Dissolved Sodium (Na)	mg/L		0.222	0.145	0.126	0.146	0.111	0.172	0.112	0.121	0.102	0.212	0.204
Dissolved Strontium (Sr)	mg/L		0.0279	0.0363	0.0331	0.0349	0.0250	0.0295	0.0341	0.0225	0.0299	0.0262	0.0245
Dissolved Sulphur (S)	mg/L		<0.5	<0.5	<0.5	0.58	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dissolved Thallium (Tl)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Tin (Sn)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Titanium (Ti)	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Tungsten (W)	mg/L		-	-	-	-	-	-	-	-	-	-	-
Dissolved Uranium (U)	mg/L		0.664	1.14	1.09	1.08	0.771	0.985	1.09	0.592	1.11	0.771	0.743
Dissolved Vanadium (V)	mg/L		0.0020	0.0023	0.0020	0.0019	0.0016	0.0018	0.0022	0.0017	0.0018	0.0015	0.0019
Dissolved Zinc (Zn)	mg/L		<0.003	<0.003	<0.003	<0.003	<0.003	0.0042	<0.003	<0.003	<0.003	<0.003	<0.003
Dissolved Zirconium (Zr)	mg/L		-	-	-	-	-	-	-	-	-	-	-
Sulphate (SO4)	mg/L		<1.5	<1.5	<1.5	1.74	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5

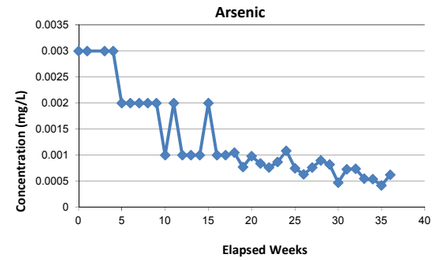
ATTACHMENT C-2

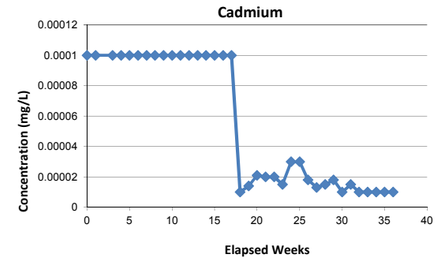
Humidity Cell – Concentration Plots

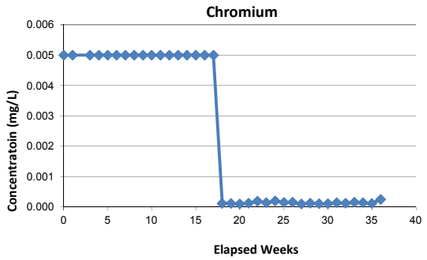
Humidity Cell Leachcate - Concentrations

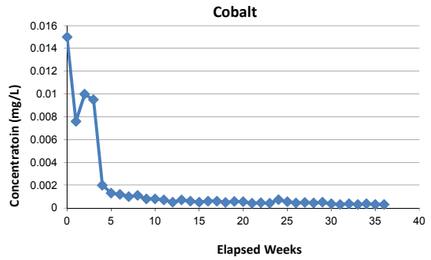


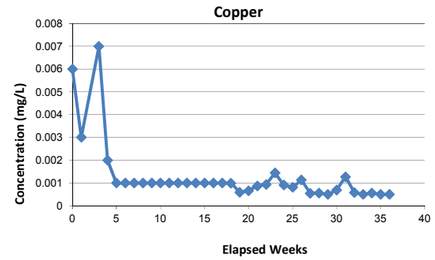


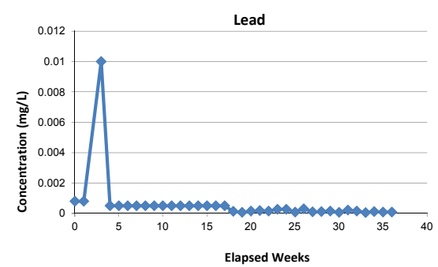


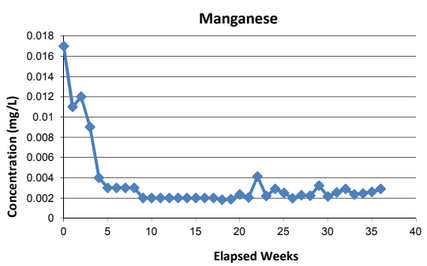


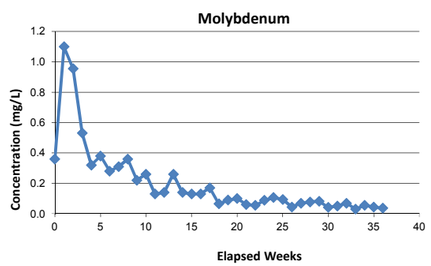


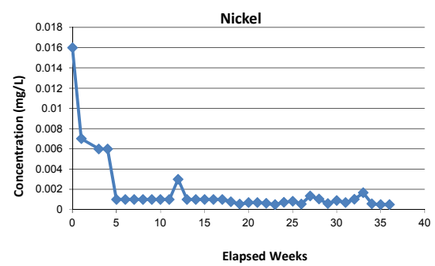


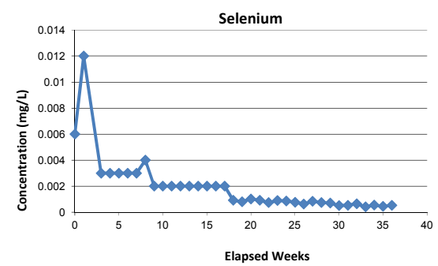


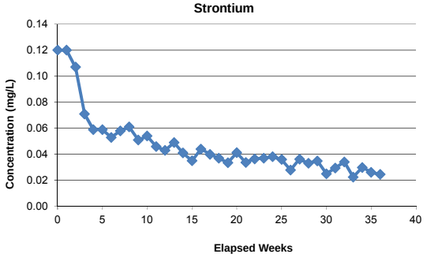


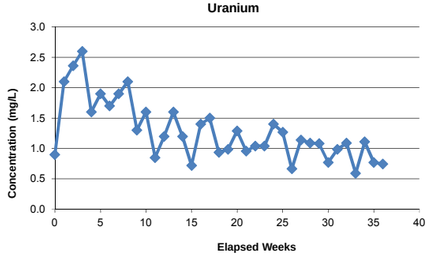


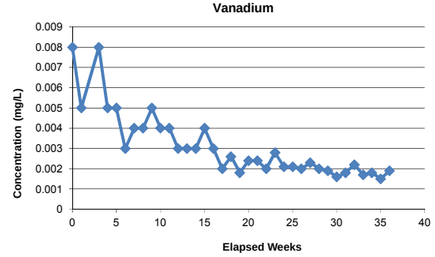


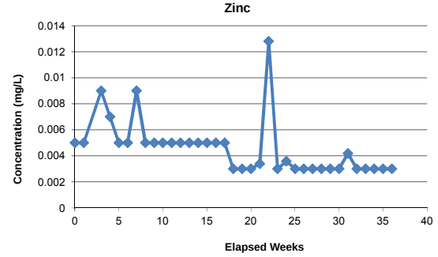


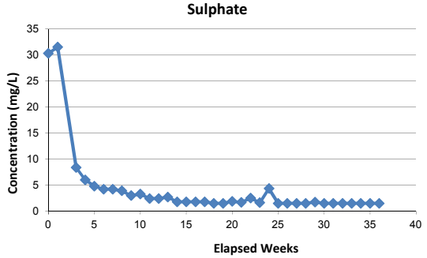


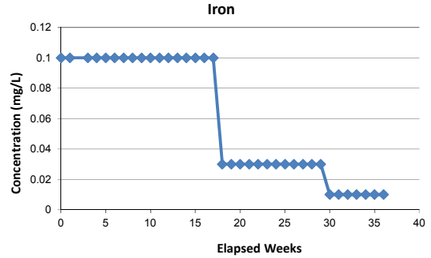












ATTACHMENT D-1

Predicted Flux Rates

Predicted Flux Rates

Constituent	Tailings	Type 3 Mine Rock		
		Column Testing		Testing
		Upper-Bound	Quasi-Equilibrium	Flooded Mine Rock from Temporary Rock Pile
	(mg/m^2-s)			
Aluminum (Al)	1.7E-10	7.5E-09	1.6E-09	1.7E-08
Antimony (Sb)	1.4E-11	1.3E-11	4.0E-12	6.9E-11
Arsenic (As)	3.7E-11	2.3E-10	7.0E-11	2.7E-10
Barium (Ba)	5.9E-10	2.6E-10	8.8E-11	8.1E-10
Beryllium (Be)	1.4E-11	1.8E-11	3.7E-12	1.8E-10
Bismuth (Bi)	6.9E-11	4.6E-11	1.8E-11	1.9E-10
Boron (B)	3.5E-08	1.4E-08	4.7E-09	3.9E-09
Cadmium (Cd)	2.3E-12	9.2E-12	8.9E-12	8.3E-12
Calcium (Ca)	8.7E-06	7.6E-07	2.8E-07	1.6E-06
Chromium (Cr)	1.4E-11	9.2E-11	3.7E-12	1.1E-10
Cobalt (Co)	8.7E-11	1.7E-11	3.7E-12	1.8E-10
Copper (Cu)	1.5E-10	1.1E-10	2.3E-11	2.8E-10
Iron (Fe)	1.4E-09	1.8E-09	3.7E-10	8.8E-09
Lead (Pb)	1.9E-11	1.9E-11	1.3E-11	7.0E-11
Lithium (Li)	3.1E-09	2.4E-09	8.6E-10	0.0E+00
Magnesium (Mg)	2.0E-05	3.1E-07	1.1E-07	2.8E-07
Manganese (Mn)	7.3E-08	7.7E-10	5.5E-10	9.2E-10
Molybdenum (Mo)	6.0E-09	2.4E-08	1.7E-08	2.6E-08
Nickel (Ni)	7.6E-11	4.6E-10	2.0E-11	3.1E-10
Phosphorus (P)	4.1E-08	2.8E-08	1.1E-08	1.1E-07
Potassium (K)	4.1E-06	2.9E-07	1.3E-07	1.9E-07
Selenium (Se)	1.8E-10	8.5E-10	5.2E-11	3.0E-10
Silicon (Si)	1.2E-07	1.3E-07	7.1E-08	1.1E-07
Silver (Ag)	1.4E-12	3.5E-11	5.3E-13	5.1E-12
Sodium (Na)	4.7E-07	3.3E-07	5.3E-08	7.7E-08
Strontium (Sr)	3.1E-08	7.7E-09	3.0E-09	1.2E-08
Sulphur (S)	3.1E-05	6.8E-07	8.2E-08	2.3E-07
Thallium (Tl)	2.1E-11	3.7E-12	7.7E-13	3.6E-11
Tin (Sn)	1.4E-11	1.8E-11	3.7E-12	5.1E-11
Titanium (Ti)	1.4E-09	9.2E-10	3.7E-10	3.5E-09
Uranium (U)	2.4E-09	6.5E-07	1.8E-07	3.6E-07
Vanadium (V)	2.1E-09	1.1E-10	3.7E-11	7.4E-10
Zinc (Zn)	1.4E-09	1.1E-10	9.2E-11	1.1E-09
Sulphate (SO4)	9.3E-05	2.0E-06	2.4E-07	7.0E-07

ATTACHMENT D-2

Predicted In-Pit TMF Surface Water Concentrations

Predicted In-Pit TMF Surface Water Concentrations

Constituent	Tailings	Type 3 Mine Rock		
		Column Testing		
		Upper-Bound	Quasi-Equilibrium	Flooded Mine Rock from Temporary Rock Pile
	mg/L			
Aluminum (Al)	3.E-05	0.001	3.E-04	0.003
Antimony (Sb)	3.E-06	3.E-06	8.E-07	1.E-05
Arsenic (As)	7.E-06	5.E-05	1.E-05	5.E-05
Barium (Ba)	1.E-04	5.E-05	2.E-05	2.E-04
Beryllium (Be)	3.E-06	4.E-06	7.E-07	4.E-05
Bismuth (Bi)	1.E-05	9.E-06	4.E-06	4.E-05
Boron (B)	0.007	0.003	0.0009	0.0008
Cadmium (Cd)	4.E-07	2.E-06	2.E-06	2.E-06
Calcium (Ca)	2	0.1	0.05	0.3
Chromium (Cr)	3.E-06	2.E-05	7.E-07	2.E-05
Cobalt (Co)	2.E-05	3.E-06	7.E-07	3.E-05
Copper (Cu)	3.E-05	2.E-05	4.E-06	5.E-05
Iron (Fe)	3.E-04	4.E-04	7.E-05	0.002
Lead (Pb)	4.E-06	4.E-06	3.E-06	1.E-05
Lithium (Li)	0.0006	5.E-04	2.E-04	0.E+00
Magnesium (Mg)	4	0.06	0.02	0.05
Manganese (Mn)	0.014	2.E-04	1.E-04	2.E-04
Molybdenum (Mo)	0.001	0.005	0.003	0.005
Nickel (Ni)	1.E-05	9.E-05	4.E-06	6.E-05
Phosphorus (P)	0.008	0.005	0.002	0.02
Potassium (K)	0.8	0.06	0.02	0.04
Selenium (Se)	3.E-05	2.E-04	1.E-05	6.E-05
Silicon (Si)	0.02	0.03	0.01	0.02
Silver (Ag)	3.E-07	7.E-06	1.E-07	1.E-06
Sodium (Na)	0.09	0.06	0.01	0.02
Strontium (Sr)	0.006	0.001	0.0006	0.002
Sulphur (S)	6	0.1	0.02	0.05
Thallium (Tl)	4.E-06	7.E-07	2.E-07	7.E-06
Tin (Sn)	3.E-06	4.E-06	7.E-07	1.E-05
Titanium (Ti)	3.E-04	2.E-04	7.E-05	0.0007
Uranium (U)	5.E-04	0.1	0.04	0.07
Vanadium (V)	4.E-04	2.E-05	7.E-06	1.E-04
Zinc (Zn)	3.E-04	2.E-05	2.E-05	2.E-04
Sulphate (SO4)	18	0.4	0.05	0.1