



PROJECT CHINA STONE

Geochemistry Report

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Geochemical Assessment of Mine and Power Station Waste Materials

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Prepared for: Hansen Bailey

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DOCUMENT CONTROL

Report Title Geochemical Assessment of Mine and Power Station Waste Materials

Project Name	Project China Stone		
Job Number	101147	Client	Hansen Bailey
Report Number	R001_A		

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GLOSSARY of TERMS and ACRONYMS

Acid	A measure of hydrogen ion (H^+) concentration; generally expressed as pH.
Acid Base Account	Evaluation of the balance between acid generation and acid neutralisation processes. Generally determines the maximum potential acidity (MPA) and the inherent acid neutralising capacity (ANC), as defined below.
AMD	Acid and Metalliferous Drainage from mine waste materials characterised by low pH, elevated metal concentrations, high sulfate concentrations and high salinity. See also “NMD”.
ANC	Acid Neutralising Capacity, expressed as kg H_2SO_4 per tonne of sample. A measure of a sample’s maximum potential ability to neutralise acid.
ANC:MPA Ratio	The ratio of the acid neutralising capacity to the maximum potential acidity of a sample. Used to assess the risk of a sample generating acid conditions.
CHPP	Coal Handling and Preparation Plant.
Coarse Reject	Coarse mineral waste material (usually in pieces greater than 1 cm) produced from the CHPP as part of the processing of coal. Coarse reject usually comprises the carbonaceous mudstone, siltstone and sandstone materials located immediately above, below and within the product coal, which is mined during coal extraction. See also “Tailings”.
EC	Electrical Conductivity, expressed as $\mu S/cm$.
eCEC	Effective cation exchange capacity provides a measure of the amount of exchangeable cations (Ca, Mg, Na and K) in a sample.
ESP	Exchangeable sodium percentage provides a measure of the sodicity of a materials and propensity to erode.
Interburden	Overburden material between mined coal seams. See also “Parting”.
Kinetic Test	Procedure used to measure the geochemical/weathering behaviour of a sample of mine material over time.
KLC test	Kinetic leach column tests are procedures used to measure the geochemical/ weathering behaviour of a sample of mine material over time.
LoR	Limit of Reporting. Laboratory detection limit for the reporting of results for a particular geochemical test.
MPA	Maximum Potential Acidity. Calculated by multiplying the total sulfur or sulfide-sulfur (Scr) content of a sample by 30.6 (stoichiometric factor) and expressed as kg H_2SO_4 per tonne.
NAF	Non-Acid Forming. Geochemical classification criterion for a sample that will not generate acid conditions.

NMD	Neutral mine drainage typically caused by exposure of sulfide minerals in mine waste materials to oxygen and water and then neutralisation by gangue minerals. Typically characterised by neutral pH and elevated concentrations of salts, sulfate and metals.
NAPP	Net Acid Producing Potential, expressed as kg H ₂ SO ₄ per tonne. Calculated by subtracting the ANC from the MPA.
Overburden	Overburden material overlying the uppermost mined resource. See also “interburden” and “Parting”.
PAF	Potentially Acid Forming. Geochemical classification criterion for a sample that has the potential to generate acid conditions.
Parting	Thin band generally less than 0.5m thick of overburden material from between economic coal seam plys.
ROM	Run-of-Mine. Coal as it comes from the mine prior to screening or processing.
%S	Percent sulfur. A measurement unit for the sulfur content of a sample material.
Scr	Chromium reducible sulfur. Analytical procedure to determine the sulfide sulfur concentration in a sample.
SO₄	Sulfate.
Static test	Procedure for characterising the geochemical nature of a sample at a single point in time. Static tests may include measurements of mineral and chemical composition of a sample and the Acid Base Account.
Tailings	Fine-grained mineral waste materials produced from the CHPP as part of the processing and washing of coal. Tailings, also called ‘fines’ or ‘fine reject’ typically comprise very fine-grained mudstone, claystone and sandstone present in CHPP wastewater, which is filtered to remove the water from the tailings, leaving behind ‘dewatered tailings’. See also “Coarse Reject”.
Total Sulfur	Total sulfur content of a sample generally measured using a ‘LECO’ analyser expressed as %S.
TSS	Total suspended solids is a measurement of the suspended solids concentration in a water sample.



1 INTRODUCTION, BACKGROUND AND CONTEXT

RGS was commissioned by Hansen Bailey on behalf of MacMines Austasia Pty Ltd (the proponent) to complete a geochemical assessment of mine and power station waste materials as part of the Environmental Impact Statement (EIS) for Project China Stone (the project).

The project involves the construction and operation of a large-scale coal mine on a greenfield site in Central Queensland. The project site (the area that will ultimately form the mining leases for the project) is remote, being located approximately 270 km south of Townsville and 300 km west of Mackay at the northern end of the Galilee Basin (**Figure 1**). The closest townships are Charters Towers, approximately 285 km by road to the north, and Clermont, approximately 260 km by road to the south-east. The project site comprises approximately 20,000 ha of well vegetated land, with low-lying scrub in the south and east and a densely vegetated ridgeline, known as 'Darkies Range', running north to south through the western portion of the site.

The mine will produce up to approximately 55 million tonnes per annum (Mtpa) of Run of Mine (ROM) thermal coal. Coal will be mined using both open cut and underground mining methods (**Figure 2**). Open cut mining operations will involve multiple draglines and truck and shovel pre-stripping. Underground mining will involve up to three operating longwalls. Coal will be washed and processed on site and product coal will be transported from site by rail. It is anticipated that mine construction will commence in 2016 and the mine life will be in the order of 50 years.

The majority of the mine infrastructure will be located in the eastern portion of the project site (**Figure 2**). Infrastructure will include coal handling and preparation plants (CHPPs), stockpiles, conveyors, rail loop and train loading facilities, workshops, dams, tailings storage facility (TSF) and a power station. A workforce accommodation village and private airstrip will also be located in the eastern part of the project site.

The project will produce the following waste materials:

- Overburden from the open cut mine that will be stored within the overburden emplacement area (OEA);
- Coarse coal reject material from the CHPP that will be buried within the overburden at the OEA;
- Fine coal reject material (tailings) from the CHPP that will be stored in the TSF; and
- Coal ash material produced from the coal-fired Power Station that will be stored in the Power Station Waste Storage Facility (WSF).

This report provides an assessment of the geochemical characteristics of these waste materials. The results of the geochemical characterisation will be taken into account in the design and operation of the overburden emplacement and waste storage facilities. In addition, an assessment of the geochemistry and potential leachate water quality from the target coal seams to be mined (A, B, C and D seams) has been conducted. The results of this assessment will be used to inform water management strategies for the coal stockpile areas.

1.1 Objective and Scope of Work

The overall objective of the RGS scope of work was to:

Evaluate the geochemical nature of mine and power station waste materials likely to be produced from the project and identify potential environmental issues that may be associated with mining, handling and storing these materials.

The RGS scope of work included geochemical characterisation, environmental risk assessment and development of management options for mine and power station waste materials likely to be generated at the Project.

Specific tasks completed in the scope of work included:

- A site visit to gain an understanding of the Project layout and ensure that the material sampling program was understood by site personnel and completed according to written guidelines.
- Implementation of the material sampling and geochemical testing program aligned with the exploration drilling program for the Project.
- Collection of drill core materials from the exploration drilling program and preparation of representative mine and power station waste samples for geochemical testing.
- Static and kinetic geochemical testing of mine and power station waste materials.
- Presentation and interpretation of geochemical test results for mine and power station waste materials.
- Development and presentation of conclusions and recommendations for the environmental management of mine and power station waste materials.
- Completion of a technical geochemical assessment report to support the EIS.



2 REGIONAL AND LOCAL GEOLOGY

2.1 Regional Geology

The Galilee Basin in Central Queensland covers approximately 250,000 km². Three main depocentres; the Lovelle Depression; Koburra Trough and Powell Depression (McElroy Bryan, 2011) were formed during crustal extension in the late Carboniferous to Mid-Triassic. Major faulting that occurred during the Late Carboniferous and Early Permian form major structural features of the Basin. The north-south trending Anakie Inlier metamorphic basement feature separates the northern part of the Galilee Basin from the Bowen Basin, while in the southern area the Nebine Ridge delineates the two basins, however the Late Permian and Triassic sequence are reasonably continuous between the two basins.

Volcanic activity during the Early Permian (Jochmus Formation) resulted in tuffs and volcanic lithic strata that underlie the Armac Coal Measures. Coal Deposits occur within a sequence of Late Permian to Early Triassic sedimentary rocks, which are characterised by undeformed sediments predominantly of fluvial origin, and are located within the Armac Coal Measures, and the Colinlea Sandstone and Bandanna Formations. The deepest part of the Galilee Basin has been documented as 2,812 m in the Koburra Trough, which consists of a thick sequence of Permian sediments (Heeswijck, 2006).

During the Early Triassic the Rewan Group was deposited from west to southwest by fluvial systems, followed by some tectonic uplift and deposition of the quartz-rich Clematis sandstone. As a result of the mid-Triassic Hunter-Brown Orogeny, the Basin tilted to the southwest followed by further compression and folding. The Jurassic-Cretaceous Eromanga formation overlies the entire Galilee Basin except for an area along the east that has exposed Permo-Triassic rocks. The Barcaldine Ridge divides the basin into northern and southern parts.

2.2 Local Geology

The geology and stratigraphy at the project site has been investigated in the exploration stage of the project (McElroy Bryan, 2011) and as part of the EIS. A representation of the indicative stratigraphy at the project site is provided in **Figure 3**. The coal occurs in the late Permian Betts Creek Beds Formation, which is comprised of sandstone with interbedded siltstone, claystone, coal and minor tuff.

The Late Permian coal bearing sequences are overlain disconformably by the Rewan Formation and the Clematis Sandstone Formation. The former consists of thinly interbedded siltstone, claystone and sandstone and the latter comprises sandstone with minor interbedding of siltstone and claystone. Tertiary sediments comprising unconsolidated claystone and sandstone complete the stratigraphic sequence.

2.3 Coal Seams

There are four target coal seams that will be mined at the project site (ie the A Seam, B Seam, C Seam and D Seam). These coal horizons are interpreted to be developed in a fluvial terrestrial depositional environment. Interburden between the seams is typically orientated upward in cycles of sandstones and siltstones, grading to mudstones and claystones.

The A and D seams will be mined in the Northern Underground. The C seam will be mined in the Southern Underground and the A and B seams will be mined in the open cut. The C seam will also be mined in the northern section of the open cut. A brief summary describing each of these seams is provided.

A Seam

The A seam is predominantly dull with minor bright bands sporadically interbedded with thin carbonaceous mudstone/mudstone/siltstone bands. The seam is interpreted to be relatively thick, ranging from 5.2 m to 18.3 m (average 13.5 m).

B Seam

The B seam is typically dull with minor bright bands occasionally grading to dull and bright banded towards the base, and is separated from the A seam by a 1 to 1.5 m carbonaceous mudstone unit. In places the seam grades to inferior coal. The B seam is interpreted to be thick ranging from 1.2 m to 9.9 m (average 7m).

C Seam

The C seam comprises numerous pale brown to cream claystones, interbedded with inferior coal grading to carbonaceous mudstone. The seam ranges from 0.5 m to 8.2 m thick (average 2.2 m).

D Seam

The D seam is predominantly dull with minor bright bands and ranges from 2.1 m to 6.0 m thick, (average 3.9 m).



3 METHODOLOGY

This section provides the methodology used for the sampling and geochemical characterisation of representative samples of mine and power station waste materials.

3.1 Desktop Review of Existing Information

A desktop review and understanding of available project data and information was completed. The review included geological data, current and proposed exploration drilling programs, proposed mining methods and mine plan, processing methods, and conceptual mine and power station waste disposal and management strategies. Discussions were held with Hansen Bailey and the proponent to identify and discuss the most relevant technical information and to understand the project description.

Geological information was obtained from exploration drill-hole logs, geological reports, and through discussions with the Project geologists. Based upon this information, a good understanding of the geological environment (lithology and stratigraphy) at the project site was developed.

3.2 Investigation Strategy

RGS developed a site-specific investigation strategy to characterise the geochemistry of mine and power station waste materials that will be generated as part of the project. The strategy was developed taking into account Australian (ACARP, 2008; DME, 1995; DITR, 2007; and DEHP, 2013) and international (INAP, 2009) technical guidelines for the geochemical assessment of mine waste materials. The sampling program was based on the expected geological variability and complexity in rock types; potential for significant environmental and/or health impacts; size of operation; sample representation requirements; mine and power station waste volumes; level of confidence in predictive ability; and cost effectiveness.

The investigation strategy focussed on the collection of representative samples of the mine and power station waste materials types that will be generated at the project, ie:

- Overburden materials from the open cut mine that will be stored in the OEA;
- Coarse Reject materials that will be stored within the overburden at the OEA;
- Fine Reject (tailings) materials that will be stored within the TSF; and
- Power Station coal ash that will be stored in the Power Station WSF.

3.3 Sampling Strategy

3.3.1 Overburden

For the collection of overburden samples, the sampling strategy used detailed site-specific exploration and geological data, to allow the targeted collection of representative samples of overburden including the main rock types from the stratigraphic profile at the project site. In addition, the strategy was designed to provide a representative distribution of samples from across the proposed mining areas. This combined approach allowed RGS to accurately sample overburden materials likely to be generated by the project.

Overburden materials reporting to the OEA will essentially comprise a mixture of overburden, interburden and coal seam roof, parting and floor materials. For the purposes of this assessment all of these materials types are collectively called overburden.

Representative samples of overburden materials were collected from two explorations drilling campaigns completed in 2012 and 2013. All drill holes were logged and sampled by a suitably qualified geologist to ensure the collection of representative samples.

A total of 285 samples of drill core and drill chip materials were collected from 18 drill holes and included in the geochemical testing program. The drill hole sampling locations are presented in **Figure 4**. The relevant drill hole numbers for the 18 drill holes are provided in Table B7 (Attachment B). A range of overburden samples and rock types were included in the geochemical assessment program to represent the overburden types that will be excavated and emplaced in the OEA during mining activities, as summarised in **Table 1**. Drill core samples included full core taken from targeted drill core depth intervals typically up to 0.5 m in length and drill chip samples typically comprised of 1 to 2 kg of material. All samples were stored in a cool dry location until dispatched to Australian Laboratory Services in Brisbane (ALS Brisbane) for geochemical testing.

3.3.2 Coarse and Fine Rejects

Representative samples of coarse and fine reject materials were generated by processing reserve samples of raw coal materials at the coal quality laboratory (Bureau Veritas) in Brisbane. A total of 56 reserve raw coal samples from the target seams included in the 2009/2010 drilling program were obtained from five drill holes (**Figure 4**). The relevant drill hole numbers for the five drill holes are provided in Table B7 (Attachment B). The coal samples were subjected to simulated coal washability tests in order to generate 23 representative samples of coarse reject that will be stored within the overburden in the OEA and two representative samples of fine reject (tailings) that will be stored within the TSF. In most cases, the drill core mass limited the number of fine reject samples that could be produced. However, all of the coarse and fine reject samples tested were geochemically benign (as described in Section 5) and the range of samples collected and tested is adequate for the purposes of this report. All 81 coal and coal reject samples were included in the geochemical testing program. Whilst raw coal material will only be stockpiled at the site for a relatively short period of time and is not a major focus of this assessment, the geochemical characteristics of coal still needed to be understood in order to generate representative samples of coarse and fine reject materials. The results of an assessment of the geochemistry and potential leachate water quality from the target coal seams can also be used to inform water management strategies for the coal stockpile areas.

3.3.3 Coal Ash

For coal ash, a 20 kg sample of power station feed coal was provided by the proponent and submitted to ALS Coal Technology laboratory at Riverview, Queensland for use in a coal ash generation (combustion) procedure. The feed coal sample was prepared by Preplab in Gladstone, Queensland to best represent the likely feed to the power station. The feed coal sample was combusted at 850 °C in a pilot-scale oven, with the sample being spread out on stainless steel trays (390 mm x 600 mm in size) at a thickness of between 20 to 25 mm. Physically spreading out the feed sample and then maintaining the target oven temperature for between 4 to 6 hours, allowed most of the coal within the sample to be converted into an ash material (approximately 4 kg). Any residual sample that had not been converted into ash was then separated out and then subject to the same target temperature for another 2 to 3 hours. This two-step procedure addresses any non-uniformity in the particle size distribution of feed coal sample. The coal ash sample generated was then used in the geochemical test program.

**Table 1: Summary of Samples used in Geochemical Assessment Program**

SAMPLE TYPE	NO. OF SAMPLES	ROCK TYPES
OVERBURDEN		
Overburden	120	Soil, Gravel, Sand, Clay, Claystone, Sandstone and Siltstone
Interburden	24	Sandstone, Claystone, Siltstone (sometimes carbonaceous) with occasional Conglomerate and Tuff
Coal Seam Roof, Parting and Floor	141	Sandstone, Claystone, Siltstone (sometimes carbonaceous) with Coal and Tuff
COAL REJECT AND COAL		
Coarse Reject	23	Coal (and various dilution)
Fine Reject	2	Coal (and various dilution)
Raw Coal	56	Coal (and various dilution)
POWER STATION FEED COAL AND COAL ASH		
Feed Coal for Power Station	1 (bulk)	Coal (and various dilution)
Coal Ash	1 (bulk)	Combusted Coal (and various dilution)
Total No. of Samples	368	

3.4 Geochemical Tests

A series of static and kinetic geochemical tests were completed on the mine and power station waste samples. All static geochemical tests were completed by ALS Brisbane laboratory and kinetic leach column (KLC) tests were completed at the RGS 'in house' laboratory, with collected leachate analysed at ALS Brisbane.

The mine and power station waste samples received by ALS Brisbane were prepared by crushing (where necessary) and pulverising to $\leq 75 \mu\text{m}$ particle size. This standard laboratory procedure provides a homogenous sample, but also generates a large sample surface area in contact with the resultant assay solution, thereby providing greater potential for dissolution and reaction, and represents an assumed initial 'worst case' scenario for these materials.

The geochemical test program was designed to assess the degree of risk from the presence and potential oxidation of sulfides, acid generation and the presence/leaching of soluble metals/metalloids and salts. The assessment also included characterisation of standard soil parameters on selected overburden materials including salinity, exchangeable cations and sodicity.

A summary of the parameters involved in geochemical assessment of mine and power station waste materials is provided in **Attachment A**.

3.4.1 Static Geochemical Test Methodology

Static geochemical tests provide a 'snapshot' of the geochemical characteristics of a sample material at a single point in time. These tests were staged to screen a large number of samples before selecting either individual and/or composite samples for more detailed static test work.

The Acid Base Account (ABA) was used as a screening procedure whereby the acid-neutralising and acid-generating characteristics of a material were assessed. All 368 samples were screened using ABA. The ABA screening included static geochemical testing for the following parameters:

- pH (1:5 w:v, sample:deionised water) [pH probe and meter];
- Electrical conductivity (EC) (1:5 w:v, sample:deionised water) [EC probe and meter];
- Total sulfur [Leco method]; and
- Acid neutralising capacity (ANC) [AMIRA, 2002 method].

The results of the ABA screening assessment are discussed in **Section 4**. Where initial ABA screening results indicated that total sulfur content was greater than average crustal abundance (0.1%) for this element (INAP, 2009), most of these samples were selected for further sulfur speciation testing. A total of 58 samples were tested for chromium reducible sulfur (Scr) [AS 4969.7-2008 method].

From the total sulfur (or Scr where available) and ANC results, the maximum potential acidity (MPA) and net acid producing potential (NAPP) of the samples were calculated. Where available, the MPA and NAPP values were calculated using Scr data instead of total sulfur data. Scr data (for fresh samples) generally provides a more accurate representation of the MPA that could theoretically be generated, as acid generation primarily occurs from oxidation of reactive sulfides (eg. pyrite), whereas total sulfur includes other forms of sulfur such as sulfate and organic sulfur, which produce negligible acidity.

After the results of the ABA screening tests were received and interpreted, 33 individual and composite samples of mine waste (and one sample of feed coal for the Power Station) were selected, prepared and subjected to multi-element analysis. The samples were selected based on material type, location, lithology and geochemical characteristics. All selected samples underwent multi-element testing on both the solid and soluble fractions for:

- Total alkalinity and acidity (PC titrator measured as CaCO_3) (1:5 w:v water extract);
- Total metals/metalloids (Al, As, B, Cd, Cr, Co, Cu, Fe, P, Pb, Mn, Mo, Ni, Sb, Se, Th, U, V and Zn) in solids [HCl and HNO_3 acid digest followed by FIMS and/or ICP-AES/MS];
- Total cations (Ca, Mg, Na and K) [HCl and HNO_3 acid digest followed by ICP-AES/MS];
- Soluble metals/metalloids (Al, As, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Sb, Se, Th, U, V and Zn) [ICP-AES/MS and FIMS (1:5 w:v water extracts)];
- Major cations (Ca, Mg, Na and K) [ICP-AES/MS (1:5 w:v water extracts)]; and
- Major anions (F – coal ash only), Cl, SO_4 and PO_4 [discrete analyser and PC titrator (1:5 w:v water extracts)].

Twenty-two of the 33 selected samples described above comprised overburden materials and these samples were subjected to an additional test to evaluate the potential 'soil quality' and sodicity of overburden materials likely to report to the OEA ie:

- Exchangeable Cations (Ca, Mg, Na, K) [by ICP-AES/MS].



From the results of the exchangeable cation test, the Effective Cation Exchange Capacity (eCEC) and Exchangeable Sodium Percentage (ESP) were calculated:

For the single power station waste (coal ash) sample, the range of geochemical tests described above was supplemented by additional geochemical tests, appropriate for a coal ash material, including:

- Total organic carbon [inorganic carbon digestion followed by LECO analyser];
- Multi-element analyses in solids (those elements listed above plus Ba, Be, Ag, Tl, Sn and Ti, [HCl and HNO₃ acid digest followed by ICP-AES and/or ICP-MS, where required];
- Total and soluble mercury (Hg) [FIMS method];
- Soluble hexavalent and trivalent chromium [alkaline digest + discrete analyser];
- Nitrogen compounds (in both solid and soluble forms): ammonia (NH₃), total kjeldahl nitrogen (TKN), nitrate (NO₃), nitrite (NO₂), total nitrogen and cyanide (CN) [discrete analyser and segmented flow analyser];
- Total and dissolved (soluble) phosphorus [discrete analyser];
- Radionuclide activity: Gross alpha, gross beta and potassium-corrected gross beta in water [ASTM D7283 - liquid scintillation counting method];
- Total Dissolved Solids (1:5 w:v at 180°C);
- Moisture Content (1:5 w:v at 103°C); and
- ASLP bottle leach procedure using deionised water [AS 4439.3-1997] to simulate multi-element solubility under neutral pH conditions. Soluble multi-element analyses included (Al, As, B, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mo, Ni, Sb, Se, Th, U, V and Zn) [ICP-AES/MS].

The static geochemical test work program is summarised in **Table 2**. The composition of each selected sample is described in **Section 4.2**.

Table 2: Summary of Static Geochemical Test Program

Geochemical Tests	Overburden	Raw Coal and Coal Reject	Feed Coal and Coal Ash
pH, EC, total sulfur, ANC, NAPP	285 samples	81 samples	2 samples
Scr	30 samples	26 samples	2 samples
Multi-elements in solids	22 individual and composite samples	11 composite samples	2 samples
Exchangeable cations	22 individual and composite samples	-	-
Alkalinity and acidity in 1:5 water extracts	22 individual and composite samples	11 composite samples	2 samples
Soluble multi-elements and major ions in 1:5 water extracts	22 individual and composite samples	11 composite samples	2 samples
The range of additional geochemical tests listed on Page 9	-	-	1 sample (coal ash)

Summary results tables for the static geochemical test program are provided in **Attachment B**. The ALS test results for the static geochemical test program are provided in **Attachment C**.

3.4.2 Kinetic Geochemical Test Methodology

Mine Waste Materials: Following receipt and interpretation of the static geochemical test results for mine waste materials, eight KLC tests were completed on crushed drill core samples at the RGS 'in-house' laboratory. The KLC tests comprised of representative composite samples of overburden, coal reject and raw coal materials likely to be generated at the Project. The KLC tests on these materials were completed in two batches and the first batch of four KLC tests for raw coal and coal reject materials was completed between July and October 2012. The second batch of four KLC tests comprised of overburden materials and was completed between November 2012 and February 2013. All KLC tests were operated under a fortnightly watering and leaching regime for the 12 week test period.

Approximately 1-2 kg of each selected sample was accurately weighed and used in the KLC tests with the weight varying according to the sample bulk density. Heat lamps were used on a daily basis to simulate sunshine and ensure that the KLC test materials were unsaturated and subject to oxidising conditions between leaching events (essentially an assumed 'worst case' scenario for sulfide oxidation and potential acid/salt generation). A description of KLC tests and schematic of the test arrangement is provided in **Attachment A**.

The KLC test material consisted of crushed drill core material passing through a nominal 5-10 mm sieve size. Approximately 1 L of deionised water was accurately weighed and slowly added to the top of each KLC sample, and allowed to free-drain through the solids. All leachate samples collected from the KLC tests were sent to ALS Brisbane laboratory for analysis of various parameters including:

- pH and Electrical Conductivity (EC) [pH and EC probes and meter];
- Acidity and alkalinity [PC titrator];
- Dissolved metals/metalloids (Al, As, B, Cd, Cr, Co, Cu, Fe, P, Pb, Mn, Mo, Ni, Sb, Se, V and Zn) [ICP-AES and FIMS];
- Major cations (Ca, Mg, Na and K) [ICP-AES]; and
- Major anions (Cl and SO₄) [ICP-AES].

Power Station Waste (Coal Ash): After the static geochemical test results for the coal ash material had been received and interpreted, two duplicate KLC tests were completed on this material at the RGS 'in-house' laboratory from November 2013 to May 2014. The KLC tests were operated under a monthly watering and leaching regime for the 26 week test period. Approximately 0.75 kg of sample was accurately weighed and used in the coal ash KLC tests. Heat lamps were used on a daily basis to simulate sunshine and ensure that the KLC test materials were unsaturated and subject to oxidising conditions between leaching events.

The KLC test material was used on an 'as received' basis and approximately 1.4 L of deionised water was accurately weighted and slowly added to the top of each sample, and allowed to free-drain through the solids. All leachate samples collected from the KLC tests were sent to ALS Brisbane laboratory for analysis of various parameters including:

- pH and EC [PC titrator];
- Alkalinity and Acidity [PC titrator];



- Soluble metals and metalloids (Al, Fe, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mn, Mo, Ni, Se, Ag, Ti, Th, Sn, Ti, U, V, Zn) [by ICP-MS];
- Dissolved mercury [FIMS method];
- Dissolved hexavalent chromium [discrete analyser];
- Major cations (Ca, Mg, K, Na) [by ICP-AES];
- Dissolved sulfate - turbidimetric [discrete analyser];
- Dissolved chloride and fluoride [discrete analyser and PC titrator];
- Nitrogen compounds: ammonia (NH₃), total kjeldahl nitrogen (TKN), nitrate (NO₃), nitrite (NO₂), total nitrogen and total cyanide (CN) [by discrete analyser and segmented flow analyser]; and
- Dissolved phosphate (measured as 'total phosphorous' in nutrient form by discrete analyser).

A copy of the geochemical results received from ALS Brisbane for these tests is provided in **Attachment C**. KLC test results and trends for all 10 KLC tests are presented in **Attachment D**.

3.5 Sample Classification Criteria

Geochemical classification of mine and power station waste materials follows some general rules (AMIRA, 2002; DITR, 1997; and INAP, 2009), although particular site characteristics such as the site geology and other site-specific geochemical and mineralogical characteristics may influence the classification criteria.

Samples from the Project were classified into five categories, with respect to potential for acid generation, using total sulfur (or preferentially Scr, where available), NAPP and ANC/MPA ratio data, the details of which are provided in **Table 3**.

Table 3: Classification Criteria for Mine and Power Station Waste Materials

Geochemical Classification	Total Sulfur or Sulfide Sulfur ¹ (%)	NAPP (kg H ₂ SO ₄ /t)	ANC: MPA Ratio
Non-Acid Forming (NAF – Barren) ²	≤ 0.1	-	-
Non-Acid Forming (NAF)	> 0.1	≤ 0	≥ 2
Uncertain ³	> 0.1	> - 3 and ≤ +3	<2
Potentially Acid Forming – Low Capacity (PAF-LC)	> 0.1	> +3 and ≤ +10	<2
Potentially Acid Forming (PAF)	> 0.1	> +10	<2

Notes:

1. If total sulfur or sulfide sulfur is less than or equal to 0.1 %, the NAPP and ANC/MPA ratio are not required for material classification as the sample is essentially barren of oxidisable sulfur.

2. A sample classified as NAF can be further described as 'barren' if the total sulfur and/or sulfide sulfur content is less than or equal to 0.1 per cent, as the sample essentially has negligible acid generating capacity.

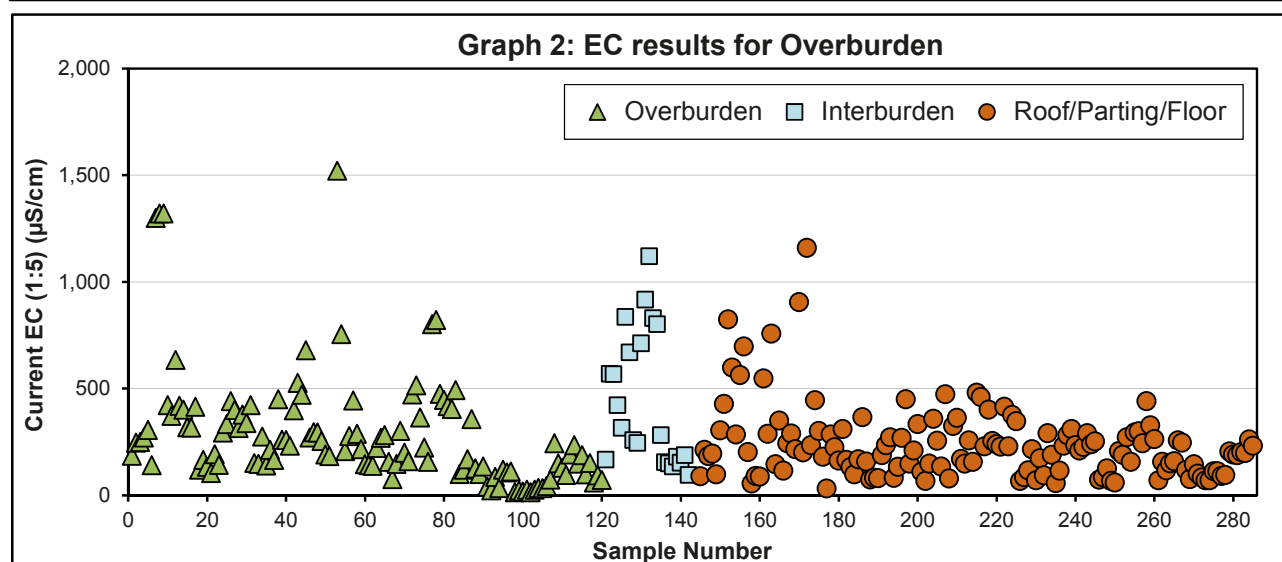
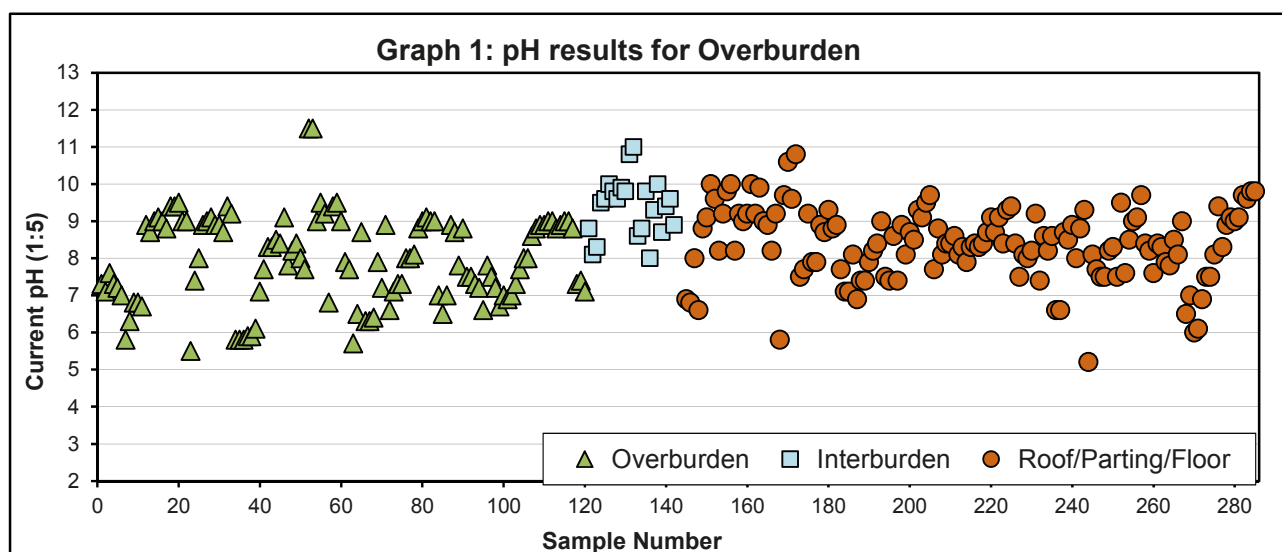
3. Samples that fall outside the stated NAF/PAF classification categories based on the criteria provided are classified as Uncertain.

4 OVERBURDEN GEOCHEMISTRY

4.1 ABA Results

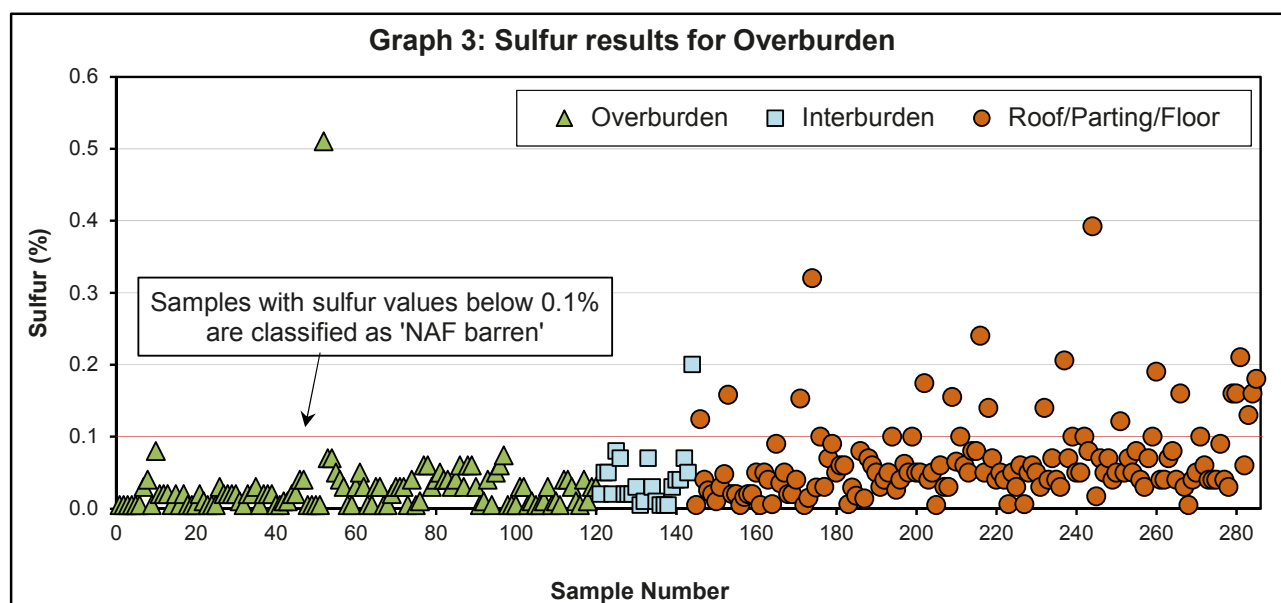
The ABA results for the 285 overburden samples are presented in **Table B-1 (Attachment B)**. An explanation of the methodology used in this section, including a description of the ABA screening method, is provided at **Section 3.4** and a glossary of terms and acronyms used is listed at **Page VI**. The ABA data trends discussed in this section are presented in **Graphs 1 to 6**.

- **pH:** The natural pH of the deionised water used in the pH tests is typically in the pH range 5.0 to 6.5. The $\text{pH}_{(1:5)}$ of the 285 samples ranges from pH 5.2 to pH 11.5 and has a slightly alkaline median pH value of 8.4 (**Graph 1**). None of the samples have a pH value less than the lower end of the typical range of the deionised water used in the tests (ie. pH 5). There is no significant correlation between the sample pH and sample location, depth, type or lithology.
- **EC:** The current $\text{EC}_{(1:5)}$ of the overburden samples ranges from 14 to 3,140 $\mu\text{S}/\text{cm}$ and has a low median value of 213 $\mu\text{S}/\text{cm}$. One overburden sample has an EC value greater than 2,000 $\mu\text{S}/\text{cm}$ and represents a composite sand (drill chip) overburden material sampled from drill hole MC5019 (H10) at 46-60m depth (**Graph 2**). There is no significant correlation between sample EC and sample location, depth, type or lithology.



- Total Sulfur:** The total sulfur content of the 285 overburden samples ranges from <0.01 % to 0.59 % and is typically low (median 0.04 %S) compared to average crustal abundance (0.1 %) for this element (INAP, 2009). Materials with a total sulfur content less than or equal to 0.1 %S are essentially barren of sulfur, generally represent background concentrations and have negligible capacity to generate acidity. Most of the overburden samples (84.5 %) have a total sulfur content less than or equal to 0.1 %S and only five samples (1.8 %) (including one overburden and four floor samples) have a total sulfur content greater than 0.3 %S. All of the 285 overburden samples have a total sulfur content less than 0.6 %S.
- Sulfide Sulfur:** Scr analysis was undertaken on 30 of the 44 overburden samples with total sulfur values greater than 0.1 %S to confirm their sulfide sulfur content. Most of the 30 samples tested had sulfide sulfur values significantly less than the total sulfur values, indicating that much of the sulfur is likely to be present as other forms of sulfur such as organic sulfur and sulfate which, in comparison to a reactive sulfur form such as pyrite, have negligible capacity to generate acidity if exposed to oxidising conditions. Only three overburden samples have a sulfide sulfur value greater than 0.3%S and some of the sulfur in these samples is likely to be present as reactive sulfur (eg. pyrite).

Graph 3 shows the sulfur content of the overburden materials¹ and illustrates that these materials typically have a very low sulfide sulfur content, with 263 of the 285 samples (92.3 %) having a sulfide sulfur content less than 0.1 %S. The results indicate that the roof, parting and floor materials have marginally higher (but still low) sulfide sulfur content (median 0.06 %S) compared to the rest of the overburden materials (0.02 %S).



Based on the sulfur data described above, it is expected that the bulk overburden materials at the project will have relatively low sulfide sulfur content.

¹ The total sulfur content of the samples was used in the graph when no sulfide sulfur data was available.



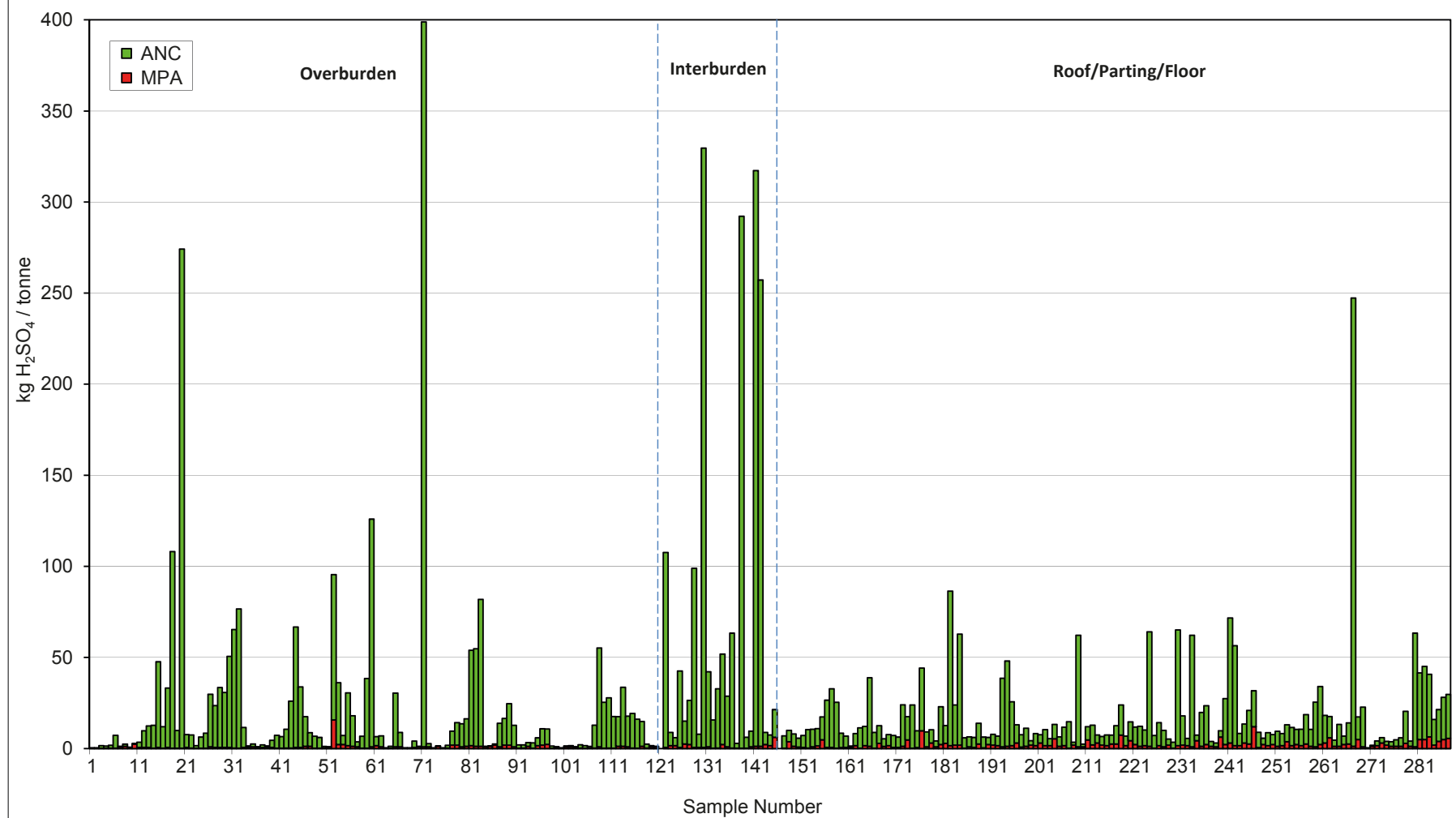
- **MPA:** The MPA for the overburden samples ranges from 0.2 to 15.6 kg H₂SO₄/t, and is typically very low with a median value of 0.9 kg H₂SO₄/t.
- **ANC:** The ANC value for the overburden samples ranges from 0.25 to 398 kg H₂SO₄/t and has a median value of 8.4 kg H₂SO₄/t (almost an order of magnitude greater than the median MPA).

Both the MPA and ANC results for the 285 overburden samples are presented in **Graph 4** (overleaf). This graph clearly shows that ANC value significantly exceeds the MPA value for most of the overburden samples.

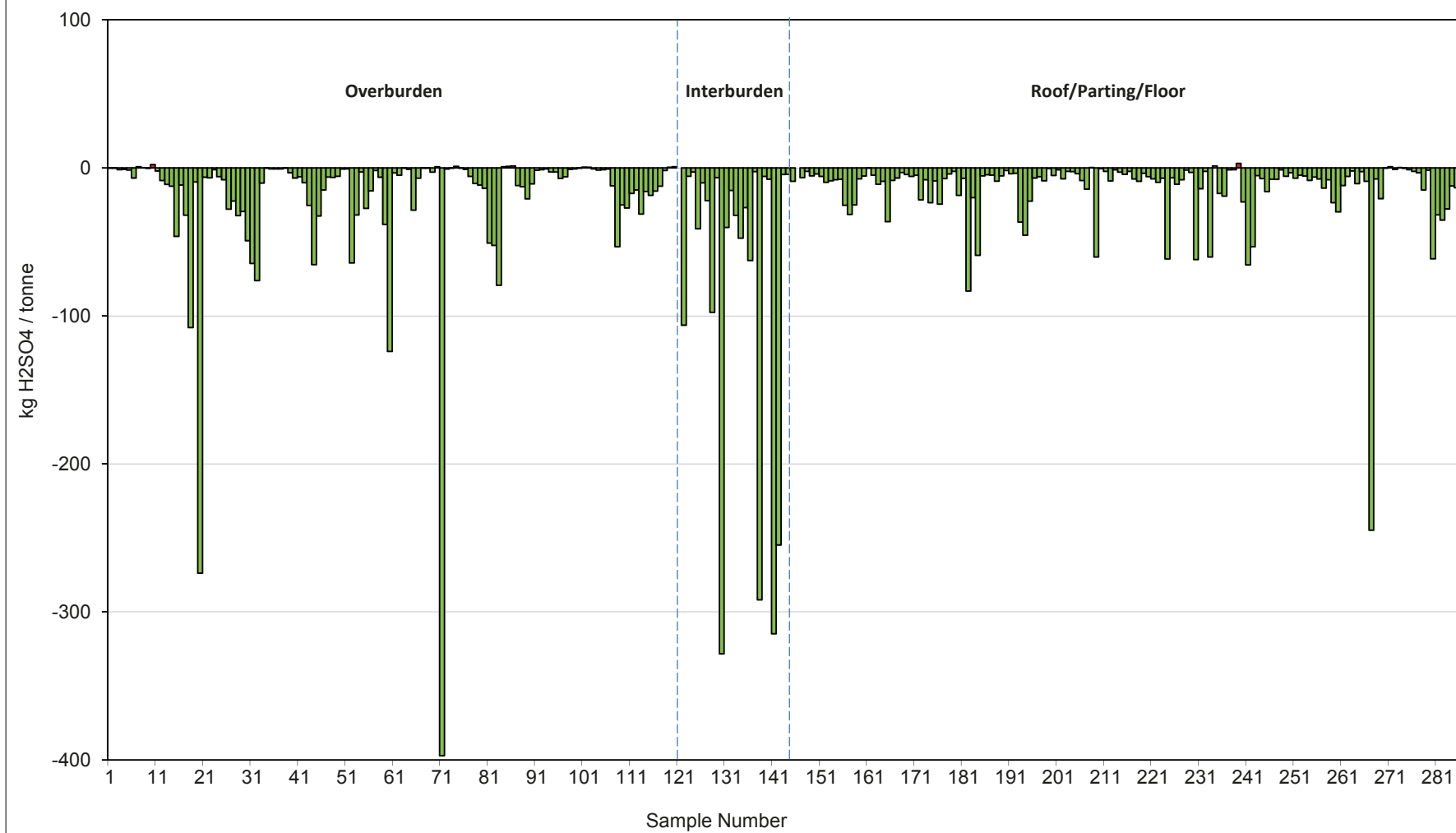
- **NAPP:** The NAPP is the balance between the capacity of a sample to generate acidity (MPA) minus its capacity to neutralise acidity (ANC). The calculated NAPP value for the samples ranges from -397 to +2.9 kg H₂SO₄/t and has a negative median value of -6.9 kg H₂SO₄/t. The NAPP data for the 285 overburden samples is presented in **Graph 5** (overleaf) and illustrates that the vast majority of overburden samples have NAPP values that are strongly negative or close to zero.

Given the typically low sulfide sulfur content of the materials, the risk of generating any significant acid and metalliferous drainage (AMD) and/or neutral mine drainage (NMD) from bulk overburden materials is negligible. None of the 285 overburden samples have a significantly positive NAPP value (ie. none greater than 3 kg H₂SO₄/t) (INAP, 2009).

Graph 4: MPA and ANC results for Overburden



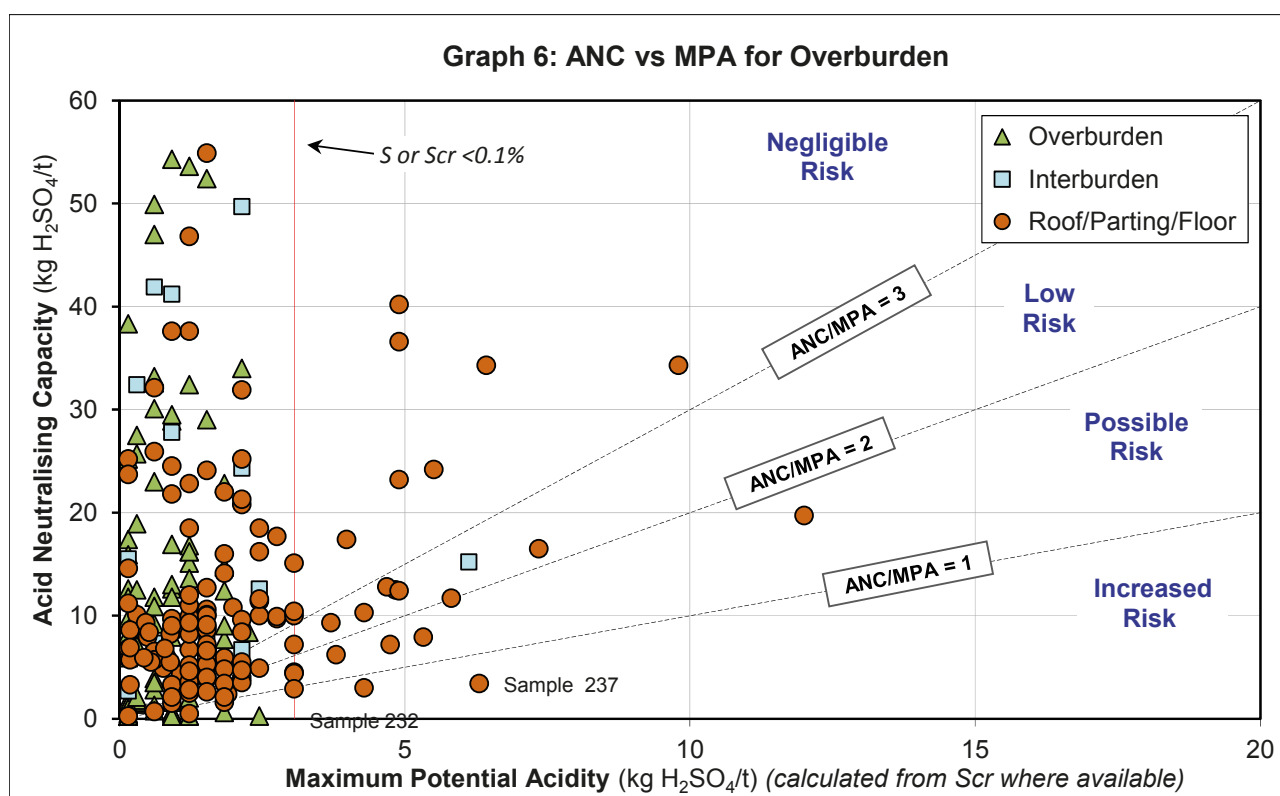
Graph 5: NAPP results for Overburden



- **ANC:MPA ratio:** The ANC:MPA ratio of the overburden samples ranges from 0.1 to 1,907 and is typically elevated (median 6.9). In simplistic terms, this means that the ANC is several times greater than the small amount of MPA that could theoretically be generated from the overburden samples.

Graph 6 shows a plot of ANC versus MPA for the overburden samples. ANC:MPA ratio lines have been plotted on the graph to illustrate the factor of safety associated with the samples, in terms of potential for generation of AMD. Generally those samples with a sulfide sulfur content of <0.1% and an ANC:MPA ratio of greater than 2 are considered to represent material with a low to negligible risk of acid generation and a high factor of safety in terms of potential for AMD (DITR, 2007; INAP, 2009). The majority of the samples fall within the negligible and low risk domains in the graph and therefore have a high factor of safety and very low risk of acid generation.

Two of the overburden samples (RGS Sample Numbers 232 and 237) fall in the 'increased risk' domain and represent roof and floor overburden materials from the A seam. However, materials represented by these samples have a very low capacity to generate acidity and will be well mixed with other overburden materials which have significant excess acid buffering capacity. Hence, the bulk overburden materials will have a high factor of safety and low risk of acid generation.



The ABA test data presented in **Table B-1 (Attachment B)** and discussed in this section has been used to classify the acid forming nature of the overburden materials. These classification criteria generally reflect Australian (DITR, 2007) and international (INAP, 2009) guideline criteria for classification of mine waste materials. **Table 4** provides a summary of the criteria used by RGS to classify the acid forming nature of the samples and a breakdown of the number of samples in each classification category by material type.

The results in **Table 4** indicate that 264 samples (98.2 %) of the 285 samples tested fall in the two Non-Acid Forming (NAF) geochemical classification categories, due to very low sulfur content and/or elevated ANC. Five overburden (one roof and four floor) samples (1.8 %) are classified as Uncertain and no samples are classified as Potentially Acid Forming (PAF).

It should be noted that the five overburden samples classified as Uncertain have low sulfide sulfur contents less than or equal to 0.2%S, low NAPP values and therefore individually, have very little capacity to generate any significant acidity.

Table 4. Geochemical Classification of Overburden Materials

Geochemical Classification	Total Sulfur or Sulfide Sulfur ¹ (%)	NAPP (kg H ₂ SO ₄ /t)	ANC/MPA Ratio	No. of Samples	% of Samples
NAF – Barren ²	≤ 0.1	-	-	264	92.6
NAF	> 0.1	≤ 0	≥ 2	16	5.6
Uncertain ³	> 0.1	> - 3 and ≤ +3	<2	5	1.8
PAF-LC	> 0.1	> +3 and ≤ +10	<2	0	0.0
PAF	> 0.1	> +10	<2	0	0.0

Notes:

1. If total sulfur or sulfide sulfur is less than or equal to 0.1 %, the NAPP and ANC/MPA ratio are not required for material classification as the sample is essentially barren of oxidisable sulfur.
2. A sample classified as NAF can be further described as 'barren' if the total sulfur and/or sulfide sulfur content is less than or equal to 0.1 per cent, as the sample essentially has negligible acid generating capacity.
3. Samples that fall outside the stated NAF/PAF classification categories based on the criteria provided are classified as Uncertain.

Overall, from an ABA perspective, the bulk overburden materials represented by the samples tested can be regarded as NAF. Most sample materials also have significant excess ANC that should be available to more than adequately buffer the negligible amount of acid that could theoretically be produced from a small proportion of these materials. Therefore, these materials have a high factor of safety and the risk of acid generation from these materials is very low.

4.2 Multi-Element Concentration in Solids

Multi-element scans were carried out on 22 selected individual and composite samples of overburden to identify any elements (metals/metalloids) present in these materials at concentrations that may be of environmental concern with respect to materials handling, storage, and water quality. The results were compared to potentially relevant guideline criteria to determine any concerns related to mine operation and final rehabilitation. To provide relevant context, RGS has compared the total metal/metalloid concentration in samples to National Environmental Protection Council (NEPC) Health-based Investigation Levels (HIL(C)) for soils in public open spaces (NEPC, 2013).

The 22 samples of overburden materials used in the multi-element test work are described in **Table B-2 (Attachment B)**. The results from multi-element testing (total metals/metalloids) of the samples are presented in **Table B-3 (Attachment B)**. The results indicate that the overburden materials typically have low total metal and metalloid concentrations in solids, mostly below the laboratory limit of reporting (LoR) and all below the applied NEPC (HIL(C)) guideline for soils.

4.3 Assessment of Element Enrichment

To provide additional context and in line with mining industry guidelines (DITR, 2007; INAP, 2009), the multi-element results described in **Section 4.2** were also compared to the average background concentration (average crustal abundance) of those elements (metal/metalloids) in soil and rock (Bowen, 1979; and INAP, 2009) (**Table B-4, Attachment B**). From this comparison, a geochemical abundance index (GAI) was calculated. The GAI quantifies an assay result for a particular element in terms of the average crustal abundance for that element. The index, based on a log (2) scale, is expressed in seven integer increments (0 to 6), which correspond to enrichment factors from 0 to over 96 times average crustal abundance, as shown in **Table 5**.

Table 5: Geochemical Abundance Index (GAI) Values and Enrichment Factor

GAI	Enrichment factor	GAI	Enrichment factor
-	Less than 3-fold enrichment	4	24 – 48 fold enrichment
1	3 – 6 fold enrichment	5	48 – 96 fold enrichment
2	6 – 12 fold enrichment	6	Greater than 96 fold enrichment
3	12 – 24fold enrichment		

As a general rule, a GAI greater than or equal to three indicates enrichment to a level that may warrant further investigation. This is the case with some environmentally important ‘trace’ elements, such as As, Cd, Cu and Zn, rather than with major rock-forming elements, such as Ca, Mg, K and Na.

Elements identified as enriched may not necessarily be a concern for revegetation, drainage water quality or public health, but their significance should still be evaluated. Similarly, because an element is not enriched does not mean it will never be a concern, because under some conditions (eg. low pH) the solubility of common environmentally important elements such as Al, Cu, Cd, Fe and Zn increases significantly.

The GAI results presented in **Table B-4 (Attachment B)** indicate that the overwhelming majority of the 22 overburden samples tested have GAI values less than 3 for all elements. The exception is a single composite overburden sample (Sample Number 3) representing roof and floor materials from the B and A seams, respectively), which is enriched with vanadium compared to average crustal abundance. The overburden materials will be well mixed at the OEA therefore the bulk overburden materials will not be significantly enriched with any elements compared to average crustal abundance.

The initial solubility of metals/metalloids in water extracts from overburden materials is discussed in **Section 4.5** and longer term solubility is discussed with respect to KLC tests in **Section 4.6**.

4.4 Effective Cation Exchange Capacity and Sodicity

In order to evaluate the potential ‘soil quality’ of overburden materials at the project, the eCEC and ESP was investigated. The results for the 22 samples described in **Sections 4.2** and **4.3** are shown in **Table B-3 (Attachment B)**. The ALS laboratory certificates for the samples subjected to exchangeable cation analysis are provided in **Attachment C**. The 22 samples represent overburden materials that will report to the OEA.

The exchangeable cation results indicate that the eCEC of the 22 samples ranges from 2.4 to 55.8 meq/100g, and is typically in the 'moderate' range (median = 22.4 meq/100g) as shown in **Table 6**. The eCEC results suggest that from a revegetation viewpoint, most overburden and materials will provide a reasonable growth medium for vegetation roots, without the need for fertiliser addition.

Table 6: Ratings for Effective Cation Exchange Capacity

eCEC Rating	CEC meq/100g
Very Low	<6
Low	6-12
Moderate	12-25
High	25-40
Very High	>40

The ESP results for the 22 composite overburden samples range from 0.4 to 14.1 % and have an average value of 2.3 %. Generally samples with ESP values less than 6 are considered non-sodic and unlikely to be susceptible to dispersion and erosion. Samples with ESP values greater than 6 are considered moderately sodic and greater than 14 are considered strongly sodic and may be susceptible to dispersion and erosion (Isbell, 2002; and Northcote and Skene, 1972). The ESP results show that most (17) of the 22 overburden samples are classified as non-sodic. Whilst four samples are classified as moderately sodic and one sample as strongly sodic, overall bulk overburden are likely to be non-sodic and consequently unlikely to be susceptible to dispersion and erosion.

The effective Cation Exchange Capacity (eCEC) results can also provide an indication of unbalanced nutrient ratios macro-nutrient deficiencies (Hazelton and Murphy, 2007). The proportions of each exchangeable cation relative to eCEC are shown in **Table 7**, along with 'desirable' proportions of each major cation. When compared to the 'desirable' ranges for exchangeable cations in soil, the median exchangeable Ca and K proportions in overburden materials are within the 'desirable' ranges, whilst the exchangeable Mg and Na proportions are slightly high.

Table 7. Proportion of eCEC for Major Exchangeable Cations

Exchangeable Cation	Desirable Ranges for Plant Growth (% eCEC)	Selected Samples (% eCEC)	eCEC Samples Compared to 'Desirable' Ranges
Calcium (Ca)	65 - 80	4 - 97 (median = 76)	Acceptable
Magnesium (Mg)	10 - 15	2 - 79 (median = 18).	Slightly High
Potassium (K)	1 - 5	<0.1 - 14 (median = 2).	Acceptable
Sodium (Na)	0 - 1	<0.1 - 6.8 (median = 2).	Slightly High

If the exchangeable Ca:Mg ratio in mine waste materials is less than 2, then these materials may require some amelioration before the materials can be used as part of a growth layer. The exchangeable cation results are provided in **Table B-3 (Attachment B)** and indicate that the sample materials have exchangeable Ca:Mg ratios ranging from 0.1 to 42 (median 4.3). Hence,

most overburden materials should provide a reasonable growth medium for vegetation roots, without the need for significant amelioration (such as gypsum or fertiliser addition).

4.5 Water Quality Static Leach Tests

RGS has compared the multi-element results in water extracts from the 22 overburden samples described in **Sections 4.2 to 4.4** with Australian guidelines and relevant receiving water quality criteria. Surface water quality impacts are addressed in the EIS Surface Water Section.

It should be recognised that direct comparison of geochemical data with guideline values can be misleading. For the purpose of this study, guideline values are only provided for broad context and should not be interpreted as arbitrary 'maximum' values or 'trigger' values. Using sample pulps (ground to passing 75 µm) provides a very high surface area to solution ratio, which encourages mineral reaction and dissolution of the solid phase. As such, the results of screening tests on water extract solutions represent an assumed 'worst case' scenario for undiluted leachate from overburden materials. The quality of actual runoff and/or seepage water from overburden emplacement areas would be better than the multi-element results due to the less optimum conditions for leaching and the significant dilution from fresh rainfall runoff. The results are therefore not representative of site drainage water quality.

The results from multi-element testing of water extracts (1:5 solid:water) from the 22 overburden samples are presented in **Table B-5 (Attachment B)**.

The pH of the water extracts ranges from pH 6.6 to 11.2 (median 8.5) and is typically above the pH range of the deionised water used in the water extract tests (ie. pH 5.0 to 6.5). This indicates that these materials are likely to contribute alkalinity to contact water. This conclusion is supported by the total alkalinity results for the water extracts, which range from 6.8 to 178.6 mg/L (median 59.2 mg/L).

The EC in the water extracts is typically low, ranging from 24 to 1,110 µS/cm (median 246 µS/cm). This confirms that these materials exhibit low salinity and low concentrations of dissolved solids when in contact with water. The dominant major cations in the water extracts are typically calcium and sodium and the dominant major soluble anions are generally chloride, sulfate and bicarbonate. The soluble sulfate concentration is below the applied livestock water quality guideline criterion (1,000 mg/L) for this parameter.

The concentration of most trace metals/metalloids tested in the 22 water extracts is below the laboratory LoR and below the applied water quality guideline criteria (ANZECC & ARCANZ, 2000). The only trace metals/metalloids which have a slightly elevated concentration in a small amount of samples are molybdenum (one sample) and selenium (four samples). However, the median values of less than the laboratory LoR (ie. <0.02 mg/L) for both these metals/metalloids are below the livestock drinking water guideline values of 0.15 mg/L and 0.02 mg/L for molybdenum and selenium, respectively.

It should be noted that the slightly elevated concentrations of molybdenum and selenium represent a "worst case" scenario in that all samples are crushed and pulverised to less than 75 µm before testing at ALS laboratory and as such, have a significantly larger surface area for potential reaction and leaching than for materials in the field situation. It is also noted that selenium is commonly detected in slightly elevated concentrations in leachate from mine waste materials as part of geochemical impact assessments for coal mines in Australia, but typically has a concentration below the laboratory limit of reporting (and relevant guideline concentrations) in the field situation.



Overall, these results indicate that dissolved metal/metalloid concentrations in initial surface runoff and seepage from overburden materials at the OEA is unlikely to significantly impact upon the quality of surface and groundwater resources.

4.6 Water Quality Kinetic Leach Tests

As described in **Section 3.4.2** and **Attachment A**, KLC tests were undertaken on four representative composite samples of overburden from the project site over a 12 week period (ie. Sample Numbers KLC 5 to KLC 8). The compositions of the composite samples used in the KLC tests are listed in **Table B-6 (Attachment B)**. The KLC results are presented in **Attachment D** and interpreted in this section.

The KLC leachate concentrations are presented alongside ANZECC & ARCANZ (2000) guideline values for livestock drinking water quality. These guidelines are provided for context only and are not intended to be interpreted as “maximum permissible levels” for site water storage or discharge. It should be noted that the ratio of sample to water in most of the KLC tests is approximately 2:1 (w/v) (i.e. concentrated), whereas the ratio of sample to water generally used in tests where results can (arbitrarily) be compared against guideline concentrations to provide relevant context is an order of magnitude more dilute at 1:5 (w/v). Whilst arbitrary comparisons against guideline concentrations can be useful in some situations and help to provide relevant context, such comparisons cannot be directly extrapolated to the field situation at the project.

4.6.1 pH, Acidity and Alkalinity

The KLC leachate pH trends for overburden shown in **Attachment D** show that the leachate pH is fairly consistent over the 12 week test period and after the initial flush remains within the pH range 7 to 9 and is typically slightly alkaline. Contact with overburden adds alkalinity to the deionised water used in the KLC tests as the typical pH of the deionised water is in the pH range 5 to 6.5.

The acidity of leachate from the overburden in the KLC tests is low (≤ 3 mg/L as CaCO_3) in all leachate samples. The alkalinity of leachate from the KLC tests is elevated (up to 267 mg/L as CaCO_3). In all cases, the alkalinity values exceed the acidity values leading to a positive net alkalinity value in leachate for all samples. This alkalinity typically buffers the pH of contact water in the range pH 7 to 9, which is within the range required to provide at least 95% species protection in aquatic ecosystems (ANZECC & ARCANZ, 2000).

4.6.2 EC, Sulfate, Residual Sulfur and Residual ANC

The EC value of leachate from the KLC tests ranges from 116 to 604 $\mu\text{S}/\text{cm}$ and has a median value of 346 $\mu\text{S}/\text{cm}$. The EC shows either a decreasing trend towards an equilibrium value or remains fairly steady over the test period. After 12 weeks of leaching under ideal oxidising (wetting and drying) conditions, the EC value in KLC leachate from all overburden samples is less than 400 $\mu\text{S}/\text{cm}$.

The concentration of sulfate in leachate from the KLC tests has been used to calculate the residual sulfur content of the overburden materials. The results show that at least 78 % of the total sulfur content remains in the samples at the end of the 12 week leaching period. The sulfate concentration in KLC leachate is generally an order of magnitude lower than the applied guideline value (1,000 mg/L) for livestock drinking water (ANZECC & ARCANZ, 2000).

The concentrations of soluble calcium and magnesium in leachate from the KLC tests have been used to calculate the residual ANC remaining in the overburden materials. The results indicate that at least 99 % of the measured ANC remains in the samples at the end of the test period.

4.6.3 Sulfide Oxidation Rate

The sulfate generation rate results obtained for the four KLC tests on overburden has been used to determine the rate of sulfide oxidation in these materials. Most sulfate salts generated from sulfide reaction involving materials with a relatively low sulfide sulfur concentration are highly soluble, and therefore will be collected in column leachate. The sulfate (and calcium) concentrations in the KLC leachate are typically less than the solubility limit of gypsum (CaSO_4), which indicates that sulfate generation is not controlled by gypsum dissolution in the KLC test materials. Therefore, the sulfate concentrations and oxidation rate calculations provide reasonable estimates of these parameters and the results align well with existing static and dynamic geochemical data derived from a wide range of mine waste materials (AMIRA, 1995).

The concentration of dissolved sulfate in leachate from most of the KLC test samples is variable but tends towards a long term equilibrium value and therefore an average value for sulfate generation rate across the test period has been used for this assessment. The sulfate generation rate and associated sulfide oxidation rate for the four KLC tests are shown in **Table 8**.

Table 8: Sulfate Generation and Sulfide Oxidation Rates for KLC Tests on Overburden

RGS-KLC Sample No.	Sample Description	Sulfate Generation Rate (mg/kg/week)	Oxidation Rate ($\text{kg O}_2/\text{m}^3/\text{s}$)
KLC 5	Overburden	20.0	1.7×10^{-8}
KLC 6	Overburden	5.3	4.7×10^{-9}
KLC 7	Overburden	5.9	5.1×10^{-9}
KLC 8	Overburden	10.3	8.8×10^{-9}

The sulfate generation rate from the overburden samples ranges from 5.3 to 20 mg/kg/week indicating that the rate of sulfide oxidation is low in these materials (equivalent to an oxidation rate ranging from 4.7×10^{-9} to 1.7×10^{-8} $\text{kg O}_2/\text{m}^3/\text{s}$). Results of previous KLC test work completed as part of a mining industry sponsored study program for mining wastes from a broad range of coal and metalliferous mines (AMIRA, 1995), indicates that mine materials with an oxidation rate in this range and moderate ANC levels have an increased factor of safety, and are likely to generate leachate that is pH neutral and/or has low levels of acidity. Hence, all of the overburden samples fall into this category and the KLC results reflect the NAF material characteristics predicted from static geochemical test results presented in **Section 4.1**.

4.6.4 Metals and Metalloids

The concentration of soluble trace metals/metalloids in leachate from the four KLC tests on overburden materials is typically very low and within applied livestock drinking water quality guidelines (ANZECC & ARCANZ, 2000). The exception is selenium, which has slightly elevated concentrations in leachate from three of the four overburden samples tested. The concentration of aluminium and molybdenum are also occasionally slightly elevated in leachate from one of the four overburden samples tested. The elevated aluminium concentration is only in one single leachate sample and is expected to be anomalous given the slightly alkaline pH. This could be due to ultrafine colloidal material passing through the sample filtration stage at the laboratory (the iron concentration is also elevated in this leachate sample as would be expected if colloidal material had passed the filtration stage).



As noted at the start of this section, the ratio of sample to water in the KLC tests is 2:1 (w/v), whereas the ratio of sample to water used in other tests where arbitrary comparisons can be made against water quality guideline concentrations is generally 1:5 (w/v). In addition, the KLC tests are performed on sample materials crushed to pass 5 mm with a relatively large surface area and are tested under fully oxidised free-draining (alternating wet and dry) conditions which typically represent a “worst-case” scenario, analogous to near surface materials at an OEA, and/or those materials located in preferential drainage flow pathways.

As previously discussed in **Section 4.5**, metals/metalloids such as selenium (and infrequently other trace metals) are commonly detected in slightly elevated concentrations in leachate from geochemical impact assessments for coal mines in Australia, and typically have concentrations below the laboratory LoR (and relevant guideline concentrations) in field situations.

Overall, these results indicate that dissolved metal/metalloid concentrations in ongoing surface runoff and seepage from overburden materials at the OEA is unlikely to significantly impact upon the quality of surface and groundwater resources.

4.7 Management Measures

Based on the benign nature of the overburden, no special management measures are required for the handling or storage of this material at the OEA.

Surface water and seepage from the OEA will be monitored to ensure that key water quality parameters remain within appropriate criteria. The proponent will:

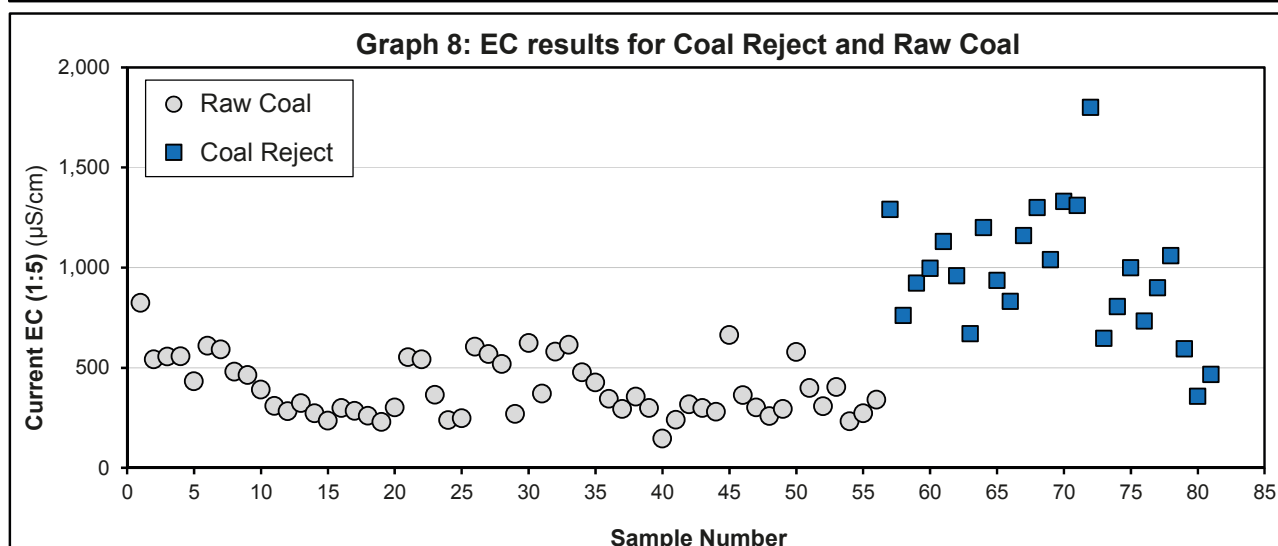
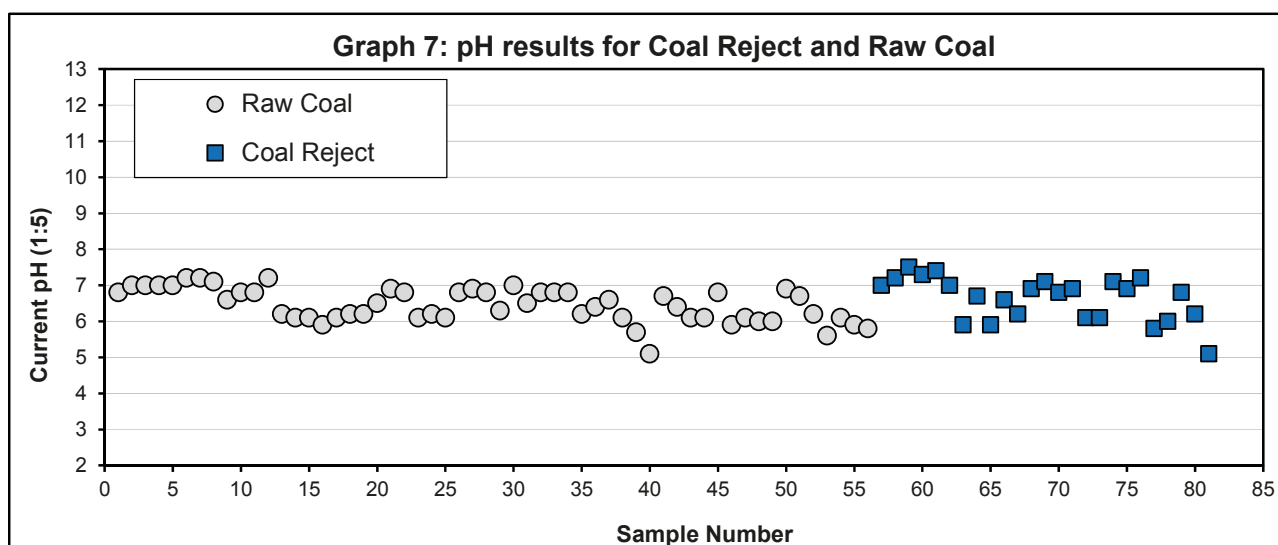
- Monitor surface run-off and seepage from the proposed OEA for pH, EC, total suspended solids (TSS) and the range of dissolved trace metals/metalloids and major ions described in this report on a quarterly basis; and
- Groundwater monitoring will also be undertaken in accordance with the program described in the EIS Groundwater Report.

5 COAL REJECT AND COAL GEOCHEMISTRY

5.1 ABA Results

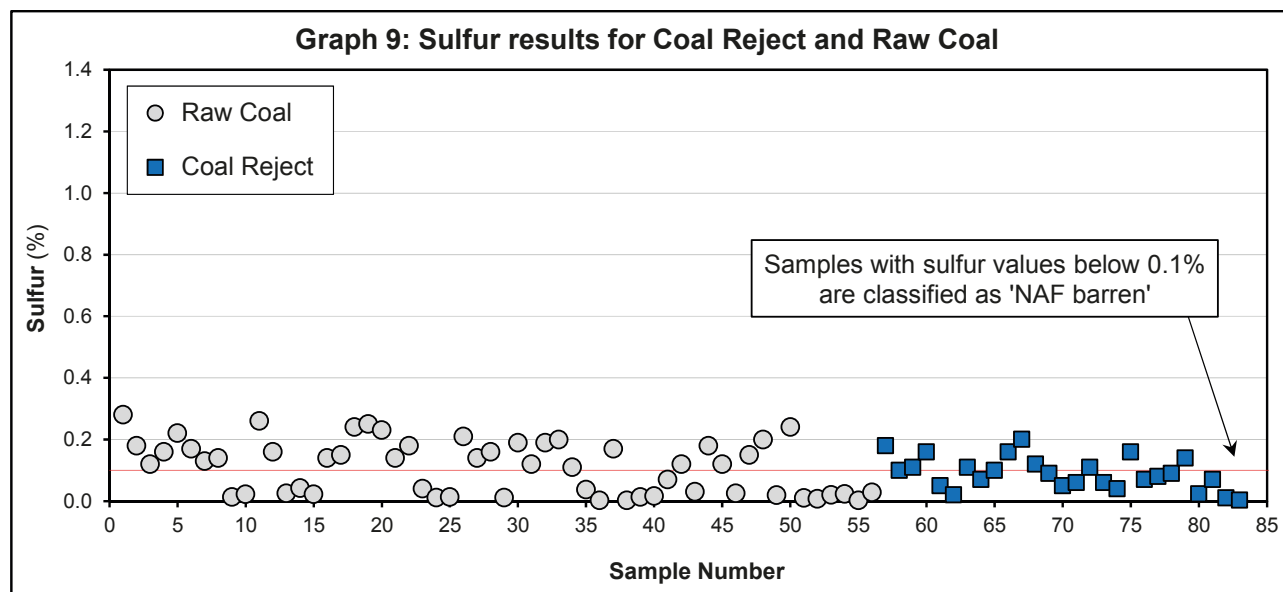
The ABA results for the 25 coal reject samples (23 coarse reject and two fine reject (tailings) samples) and the 56 raw coal samples used to generate the coal reject samples are presented in **Table B-7 (Attachment B)**. An explanation of the methodology used in this section, is provided at **Section 3.4** and a glossary of terms and acronyms used is listed at **Page VI**. The ABA data trends discussed in this section are presented in **Graphs 7 to 12**.

- pH:** The natural pH of the deionised water used in the pH tests is typically in the pH range 5.0 to 6.5. The $\text{pH}_{(1:5)}$ of the 81 samples ranges from pH 5.1 to pH 7.5 and has a neutral median pH value 6.6 (**Graph 7**). None of the samples have a pH value less than the lower end of the typical range of the deionised water used in the tests (ie. pH 5). There is no significant correlation between the sample pH and coal seam or material type.
- EC:** The current $\text{EC}_{(1:5)}$ of the 81 samples ranges from 146 to 1,800 $\mu\text{S}/\text{cm}$ and has a relatively low median value of 478 $\mu\text{S}/\text{cm}$. The EC of the coal reject samples is typically greater than the raw coal samples (**Graph 8**). There is no significant correlation between sample EC and coal seam.



- Total Sulfur:** The total sulfur content of the 81 coal reject and raw coal samples ranges from 0.02 % to 0.33 % and is typically low (median 0.17 %S) compared to average crustal abundance (0.1 %) for this element (INAP, 2009). Materials with a total sulfur content less than or equal to 0.1 %S are essentially barren of sulfur, generally represent background concentrations, and have negligible capacity to generate acidity. Just over half (52 %) of the 25 coal reject samples have a total sulfur content less than or equal to 0.1 %S. All of the coal reject samples and all but one of the raw coal samples have a total sulfur content less than 0.3 %S.
- Sulfide Sulfur:** Scr analysis was undertaken on 26 of the 81 coal reject and raw coal samples to confirm their sulfide sulfur content. Most of the 26 samples tested had a sulfide sulfur value significantly less than the total sulfur value, indicating that much of the sulfur is likely to be present as other forms of sulfur such as organic sulfur and sulfate which, in comparison to a reactive sulfur form such as pyrite, has negligible capacity to generate acidity if exposed to oxidising conditions.

Graph 9 shows the sulfur content of the 81 coal reject and raw coal samples² and illustrates that these materials typically have a very low sulfide sulfur content, with 49.4 % having a sulfide sulfur content less than or equal to 0.1 %; and all samples having a sulfide sulfur content less than 0.3 %S.

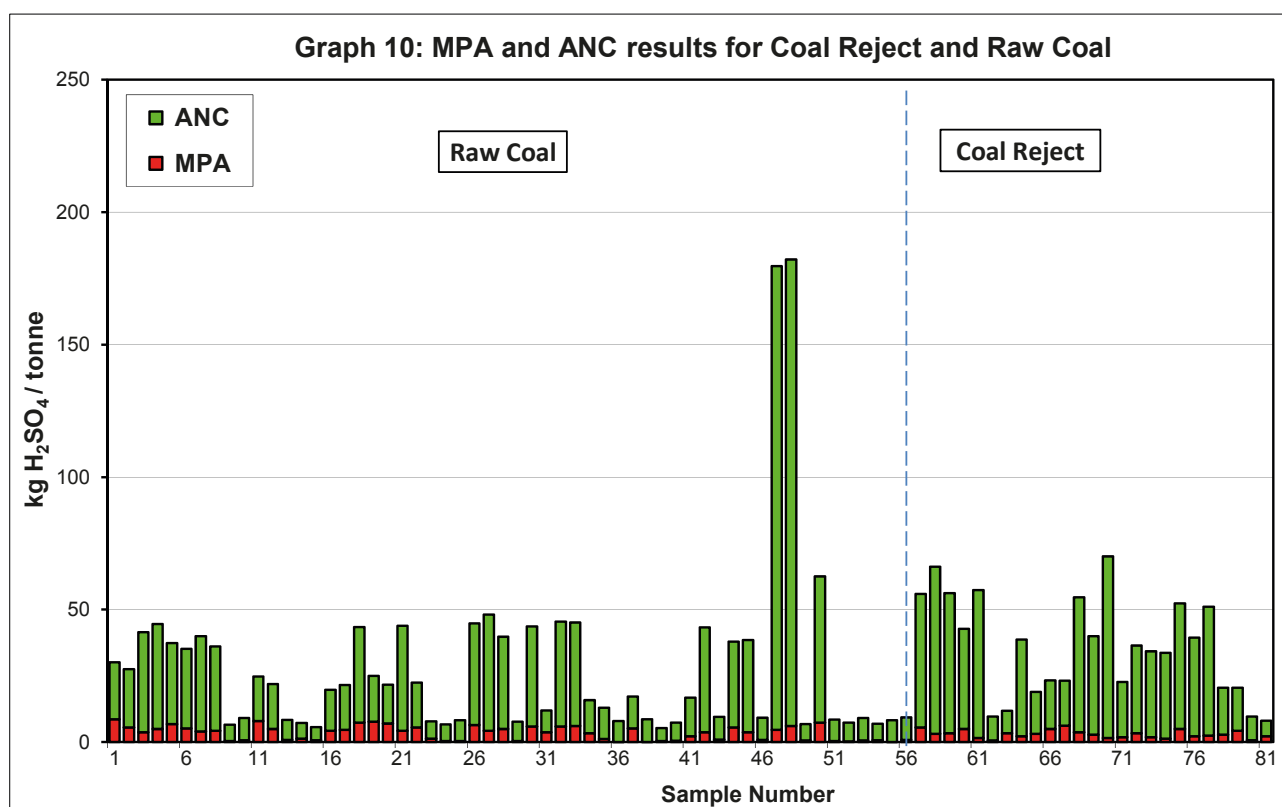


Based upon the sulfur data described above, it is expected that the bulk coal reject and coal materials at the project will have low sulfide sulfur content.

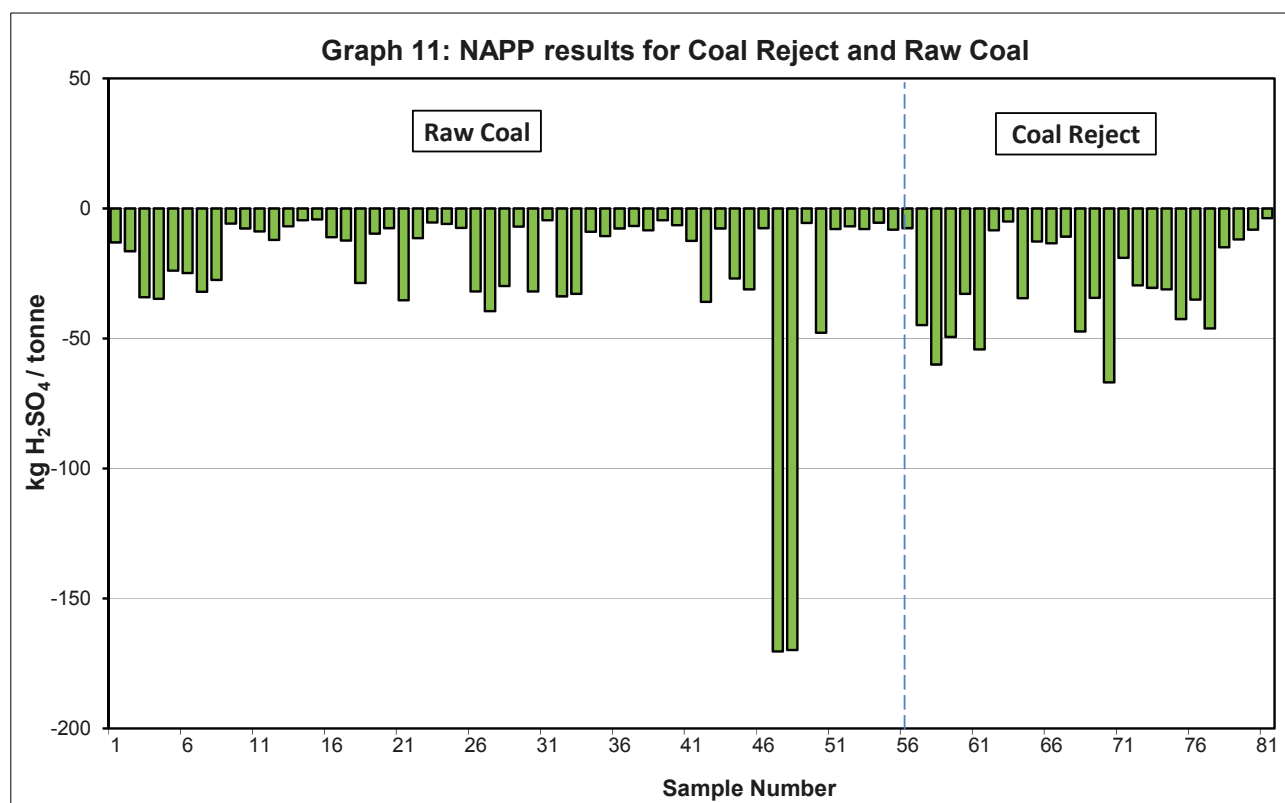
- MPA:** The MPA for the 81 coal reject and raw coal samples ranges from 0.1 to 8.6 kg $\text{H}_2\text{SO}_4/\text{t}$ and is typically low with a median value of 3.4 kg $\text{H}_2\text{SO}_4/\text{t}$.
- ANC:** The ANC for the samples ranges from 4.9 to 176 kg $\text{H}_2\text{SO}_4/\text{t}$ and has a median value of 17.3 kg $\text{H}_2\text{SO}_4/\text{t}$ (five times greater than the median MPA).

Both the MPA and ANC results for the 81 samples are presented in **Graph 10** (overleaf). This graph clearly shows that the ANC value significantly exceeds the MPA value for most of the coarse reject and raw coal samples.

² The total sulfur content of the samples was used in the graph when no sulfide sulfur data was available.

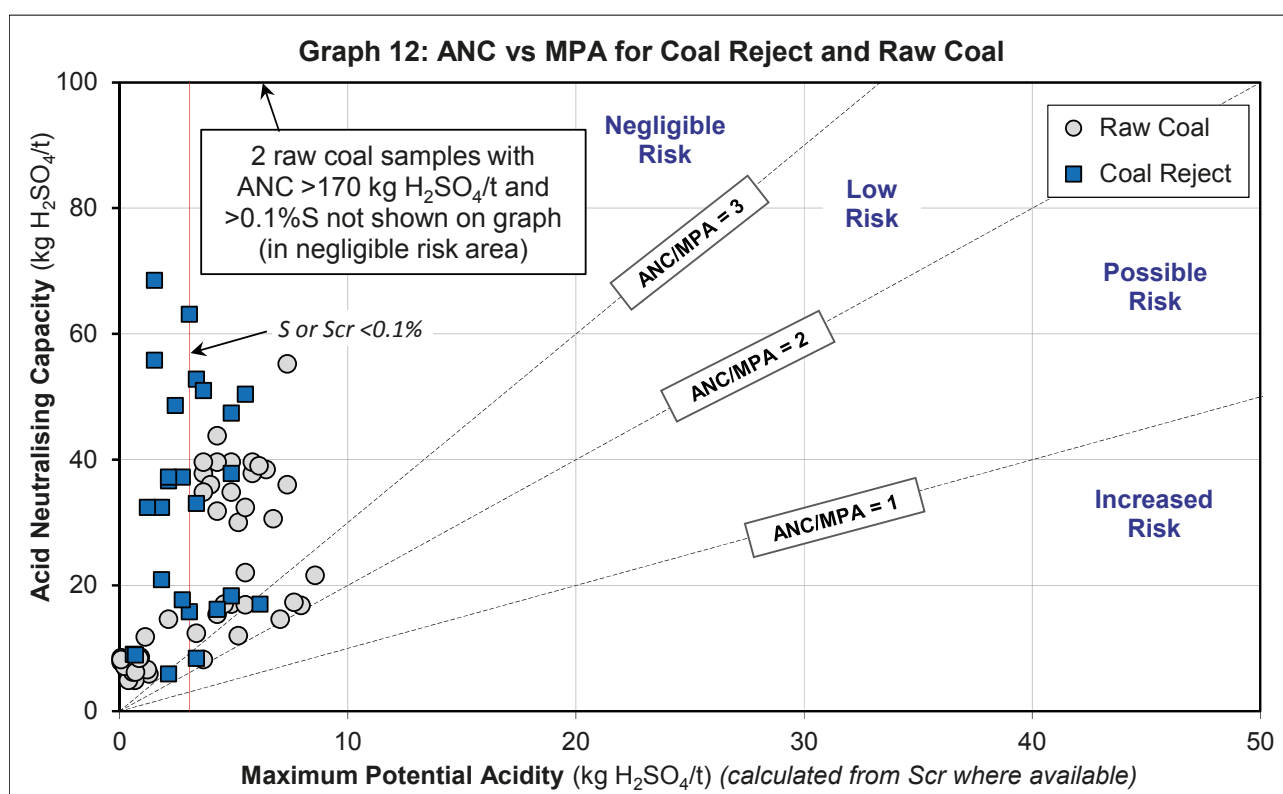


- NAPP:** The calculated NAPP value for the samples ranges from -170.4 to +3.8 kg H₂SO₄/t, and is typically negative (median -12.7 kg H₂SO₄/t). All of the 81 coal reject and raw coal samples tested have a negative NAPP value as illustrated in **Graph 11**.



- **ANC:MPA ratio:** The ANC:MPA ratio of the coal reject and raw coal samples ranges from 2.1 to 111 and is typically elevated (median 9.4). In simplistic terms, this means that the ANC is almost an order of magnitude greater than the small amount of MPA that could theoretically be generated from the samples.

Graph 12 shows a plot of ANC versus MPA for the 81 coal reject and raw coal samples. ANC:MPA ratio lines have been plotted on the graph to illustrate the factor of safety associated with the samples in terms of potential for generation of AMD. Generally those samples with an ANC:MPA ratio of greater than 2 and a sulfide sulfur content of <0.1% are considered to represent material with a low to negligible risk of acid generation and a high factor of safety in terms of potential for AMD (DITR, 2007; INAP, 2009). All of the samples fall within the negligible and low risk domains in the graph and therefore have a high factor of safety and very low risk of acid generation.



The ABA test data presented in **Table B-7 (Attachment B)** and discussed in this section has been used to classify the acid forming nature of the coal reject and raw coal materials. These classification criteria generally reflect Australian (DITR, 2007) and international (INAP, 2009) guideline criteria for classification of mine waste materials. **Table 9** provides a summary of the criteria used by RGS to classify the acid forming nature of the samples and a breakdown of the number of samples in each classification category by material type.

The results in **Table 9** indicate that all of the coal reject and raw coal samples tested fall in the two NAF geochemical classification categories, due to very low sulfur content and/or elevated ANC.

Table 9: Geochemical Classification of Coal Reject and Raw Coal Materials

Geochemical Classification	Total Sulfur or Sulfide Sulfur ¹ (%)	NAPP (kg H ₂ SO ₄ /t)	ANC/MPA Ratio	No. of Samples	% of Samples
NAF – Barren ²	≤ 0.1	-	-	39	48.1
NAF	> 0.1	≤ 0	≥ 2	42	51.8
Uncertain ³	> 0.1	> - 3 and ≤ +3	<2	0	0.0
PAF-LC	> 0.1	> +3 and ≤ +10	<2	0	0.0
PAF	> 0.1	> +10	<2	0	0.0

Notes:

1. If total sulfur or sulfide sulfur is less than or equal to 0.1 %, the NAPP and ANC/MPA ratio are not required for material classification as the sample is essentially barren of oxidisable sulfur.

2. A sample classified as NAF can be further described as 'barren' if the total sulfur and/or sulfide sulfur content is less than or equal to 0.1 per cent, as the sample essentially has negligible acid generating capacity.

3. Samples that fall outside the stated NAF/PAF classification categories based on the criteria provided are classified as Uncertain.

Overall, from an ABA perspective, the bulk coal reject and raw coal materials represented by the samples tested can be regarded as NAF. Most sample materials also have significant excess ANC that should be available to more than adequately buffer the negligible amount of acid that could theoretically be produced from a small proportion of these materials. Therefore, these materials have a high factor of safety and the risk of acid generation from these materials is very low.

5.2 Multi-Element Concentration in Solids

Multi-element scans were carried out on 11 selected individual and composite samples of coal reject and raw coal to identify any elements (metals/metalloids) present in these materials at concentrations that may be of environmental concern with respect to materials handling, storage, and water quality. The results were compared to potentially relevant guideline criteria to determine any concerns related to mine operation and final rehabilitation. To provide relevant context, RGS has compared the total metal/metalloid concentration in samples to NEPC HIL(C) for soils in public open spaces (NEPC, 2013).

The 11 samples of coal reject and raw coal materials used in the multi-element test work are described in **Table B-8 (Attachment B)**. It should be noted that nine of the 11 samples used in this part of the assessment contain a proportion of materials derived from the deeper E, F and G coal seams, which will now not be mined at the project. Some of these materials have different geochemical characteristics to materials derived from the target coal seams (*ie.* A, B, C and D seams).

The results from multi-element testing (total metals/metalloids) of the samples are presented in **Table B-9 (Attachment B)**. The results indicate that the coal reject and raw coal materials typically have low total metal and metalloid concentrations in solids, mostly below the laboratory LoR and all below the applied NEPC (HIL(C)) guideline for soils.

5.3 Assessment of Element Enrichment

To provide additional context and in line with mining industry guidelines (DITR, 2007; INAP, 2009), the multi-element results described in **Section 5.2** were also compared to the average background concentration (average crustal abundance) of those elements (metal/metalloids) in soil and rock



(Bowen, 1979; and INAP, 2009) (**Table B-10, Attachment B**). The GAI results indicate that all of the selected coal reject and coal samples tested have GAI values less than 3 for all elements.

The initial and longer term solubility of metals/metalloids from coal reject and coal materials are discussed for water extracts in **Section 5.4** and KCL tests in **Section 5.5**, respectively.

5.4 Water Quality Static Leach Tests

RGS has compared the multi-element results in water extracts from the 11 coal reject and raw coal samples described in **Sections 5.2** and **5.3** with Australian guidelines and relevant receiving water quality criteria. Surface water quality impacts are addressed in the EIS Surface Water Section.

It should be recognised that direct comparison of geochemical data with guideline values can be misleading. For the purpose of this study, guideline values are only provided for broad context and should not be interpreted as arbitrary 'maximum' values or 'trigger' values. Using sample pulps (ground to passing 75 µm) provides a very high surface area to solution ratio, which encourages mineral reaction and dissolution of the solid phase. As such, the results of screening tests on water extract solutions represent an assumed 'worst case' scenario for undiluted leachate. The quality of actual runoff and/or seepage water from overburden emplacement areas would be better than the multi-element results due to the less optimum conditions for leaching and the significant dilution from fresh rainfall runoff. The results are therefore not representative of site drainage water quality.

It is also stressed that nine of the 11 individual and composite samples used in this part of the assessment contain a proportion of materials derived from the deeper E, F and G coal seams, which will now not be mined at the project. Some of these materials have different geochemical characteristics to materials derived from the target coal seams (*ie.* A, B, C and D seams).

The results from multi-element testing of water extracts (1:5 solid:water) from the 11 coal reject and raw coal samples are presented in **Table B-11 (Attachment B)**.

The pH of the water extracts ranges from pH 3.6 to 7.0 (median 5.5). The two acidic water extracts from coal reject Sample Numbers 7 and 10 contain a proportion of materials from the E, F and G coal seams, which will not be mined at the project. The remaining coal reject and raw coal samples have water extract pH values within or slightly above the pH range of the deionised water used in the water extract tests (*ie.* pH 5.0 to 6.5). Most sample materials (apart from coal reject Sample Number 10) appear likely to contribute some alkalinity to contact water as the total alkalinity measured in all water extracts ranges from <0.2 to 166 mg/L (median 62 mg/L).

The EC in the water extracts is relatively low, ranging from 276 to 1,900 µS/cm (median 574 µS/cm), although these values are skewed higher by the inclusion of PAF coal reject materials from E and F seams in Sample Numbers 7 and 10. This confirms that materials from the target A, B, C and D seams exhibit low salinity and low concentrations of dissolved solids when in contact with water. The dominant major cations in the water extracts are typically calcium and sodium and the dominant major soluble anions are generally chloride, sulfate and bicarbonate. The soluble sulfate concentration in all samples is below the applied livestock water quality guideline criterion (1,000 mg/L) for this parameter.

The concentration of most trace metals/metalloids tested in the 11 water extracts is below the laboratory LoR and below the applied water quality guideline criteria (ANZECC & ARCANZ, 2000). The only trace metals/metalloids which have a slightly elevated concentration in some samples are aluminium (one sample *ie.* acidic Sample Number 10 from the F seam which will not be mined) and selenium (seven samples). The concentration of selenium in the two samples containing material from the target seams only (*ie.* RGS Sample Numbers 1 and 3) are equal to the livestock drinking water guideline value of 0.02 mg/L for selenium.

It should be noted that the slightly elevated concentration of selenium represent a “worst case” scenario in that all samples are crushed and pulverised to less than 75 µm before testing at ALS laboratory and as such, have a significantly larger surface area for potential reaction and leaching than for materials in the field situation. As previously noted, selenium is commonly detected in slightly elevated concentrations in leachate from mine waste materials as part of geochemical impact assessments for coal mines in Australia, but typically has a concentration below the laboratory LoR (and relevant guideline concentrations) in the field situation.

Overall, these results indicate that dissolved metal/metalloid concentrations in initial surface runoff and seepage from coal reject materials at the OEA and raw coal stockpiles is unlikely to significantly impact upon the quality of surface and groundwater resources.

5.5 Water Quality Kinetic Leach Tests

As described in **Section 3.4.2** and **Attachment A**, KLC tests were undertaken on four representative individual and composite samples of coal reject and raw coal from the project site over a 12 week period (ie. Sample Numbers KLC 1 to KLC 4). The compositions of the composite samples used in the KLC tests are listed in **Table B-12 (Attachment B)**. The KLC results are presented in **Attachment D** and interpreted in this section.

Three of the four KLC test materials contain some material from the E seam (which will not be mined) as well as the from the target seams. In particular, Sample Numbers KLC2 and KLC3 contain some material derived from the E seam which has different geochemical properties to that of the target coal seams.

The KLC leachate concentrations are presented alongside ANZECC & ARCANZ (2000) guideline values for livestock drinking water quality. These guidelines are provided for context and are not intended to be interpreted as “maximum permissible levels” for site water storage or discharge. It should be noted that the ratio of sample to water in most of the KLC tests is approximately 2:1 (w/v) (ie. concentrated), whereas the ratio of sample to water generally used in tests where results can (arbitrarily) be compared against guideline concentrations to provide relevant context is an order of magnitude more dilute at 1:5 (w/v). Whilst arbitrary comparisons against guideline concentrations can be useful in some situations and help to provide relevant context, such comparisons cannot be directly extrapolated to the field situation at the project.

5.5.1 pH, Acidity and Alkalinity

The KLC leachate pH trends for coal reject and raw coal shown in **Attachment D** show that the leachate pH is fairly consistent over the 12 week test period and after the initial flush remains within the pH range 6.5 to 7.5 and is typically slightly alkaline. Contact with these materials adds alkalinity to the deionised water used in the KLC tests as the typical pH of the deionised water is in the pH range 5 to 6.5.

The acidity of leachate from the KLC test materials is low (≤ 3 mg/L as CaCO_3) in all leachate samples apart from the initial leachate from Sample Number KLC3. The alkalinity of leachate from the KLC tests is elevated (up to 64 mg/L as CaCO_3). In all cases, the alkalinity values exceed the acidity values leading to a positive net alkalinity value in leachate for all samples. This alkalinity typically buffers the pH of contact water at about pH 7, which is within the range required to provide at least 95% species protection in aquatic ecosystems (ANZECC & ARCANZ, 2000).

5.5.2 EC, Sulfate, Residual Sulfur and Residual ANC

The EC value of leachate from the KLC tests ranges from 112 to 2,238 µS/cm and has a median value of 279 µS/cm. The EC shows a decreasing trend towards an equilibrium value over the test



period. After 12 weeks of leaching under ideal oxidising (wetting and drying) conditions, the EC value in KLC leachate from all but Sample Number KLC3 is less than 200 $\mu\text{S}/\text{cm}$.

The concentration of sulfate in leachate from the KLC tests has been used to calculate the residual sulfur content of the sample materials. The results show that at least 91 % of the total sulfur content remains in the samples at the end of the 12 week leaching period. The sulfate concentration in KLC leachate is generally an order of magnitude lower than the applied guideline value (1,000 mg/L) for livestock drinking water (ANZECC & ARCANZ, 2000) in all but Sample Number KLC3 which contains some PAF material from the E seam, which will not be mined.

The concentrations of soluble calcium and magnesium in leachate from the KLC tests have been used to calculate the residual ANC remaining in the overburden materials. The results indicate that at least 97 % of the measured ANC remains in the samples at the end of the test period.

5.5.3 Sulfide Oxidation Rate

The sulfate generation rate results obtained for the four KLC tests on coarse reject and raw coal has been used to determine the rate of sulfide oxidation in these materials. The sulfate generation rate and associated sulfide oxidation rate for the four KLC tests are shown in **Table 10**.

Table 10: Sulfate Generation and Sulfide Oxidation Rates for KLC Tests on Coal Reject and Raw Coal

RGS-KLC Sample No.	Sample Description	Sulfate Generation Rate (mg/kg/week)	Oxidation Rate (kg O ₂ /m ³ /s)
KLC 1	Raw Coal	12.9	1.1×10^{-8}
KLC 2	Raw Coal	15.4	1.3×10^{-8}
KLC 3	Coal Reject	93.3	8.1×10^{-8}
KLC 4	Coal Reject	14.4	1.3×10^{-8}

The sulfate generation rate from the coal reject and raw coal samples ranges from 14.4 to 93.3 mg/kg/week indicating that the rate of sulfide oxidation is relatively low in these materials (equivalent to an oxidation rate ranging from 1.3×10^{-8} to 8.1×10^{-8} kg O₂/m³/s). The four KLC samples have oxidation rates in the range that reflects NAF materials as described in **Section 4.6.3**. Hence, the KLC results for these samples confirm the NAF material characteristics predicted from static geochemical test results presented in **Section 5.1**.

5.5.4 Metals and Metalloids

The concentration of soluble trace metals/metalloids in leachate from the four KLC tests on coal reject and raw coal materials is typically very low and within applied livestock drinking water quality guidelines (ANZECC & ARCANZZ, 2000). The exception is selenium, which has elevated concentrations in some of the leachate from the four samples tested.

As noted at the start of this section, the ratio of sample to water in the KLC tests is 2:1 (w/v), whereas the ratio of sample to water used in other tests where arbitrary comparisons can be made against water quality guideline concentrations is generally 1:5 (w/v). In addition, the KLC tests are performed on sample materials crushed to pass 5 mm with a relatively large surface area and are tested under fully oxidised free-draining (alternating wet and dry) conditions which typically represent a “worst-case” scenario, analogous to near surface materials at an OEA or stockpile area and/or those materials located in preferential drainage flow pathways.

As previously discussed in **Section 5.4**, metals/metalloids such as selenium (and infrequently other trace metals) are commonly detected in slightly elevated concentrations in leachate from geochemical impact assessments for coal mines in Australia, and typically have concentrations below the laboratory limit of reporting (and relevant guideline concentrations) in field situations.

Overall, these results indicate that dissolved metal/metalloid concentrations in surface runoff and seepage from coal reject materials at the OEA and raw coal stockpile is unlikely to significantly impact upon the quality of surface and groundwater resources.

5.6 Management Measures

Based on the benign nature of the coal reject and raw coal from the target seams, no special management measures are required for the handling or storage of these materials at the OEA, TSF or at the raw coal stockpile.

Surface water and seepage from the OEA, TSF and raw coal stockpile will be monitored to ensure that key water quality parameters remain within appropriate criteria. The proponent will:

- Monitor surface run-off and seepage from the proposed OEA, TSF and raw coal stockpile for pH, EC, TSS and the range of dissolved trace metals/metalloids and major ions described in this report on a quarterly basis; and
- Groundwater monitoring will also be undertaken in accordance with the program described in the EIS Groundwater Report.



6 POWER STATION FEED COAL AND COAL ASH GEOCHEMISTRY

6.1 Acid Base Account Results

The ABA results for the power station bulk feed coal and coal ash samples (one sample of each) are presented in **Table B-13 (Attachment B)** and discussed in this section. An explanation of the methodology used in this section, is provided at **Section 3.4** and a glossary of terms and acronyms used is listed at **Page VI**.

- **pH:** The pH_(1:5) of the bulk feed coal and coal ash samples is pH 8.1 and 10.6, respectively.
- **EC:** The EC_(1:5) of the bulk feed coal and coal ash samples is 142 and 1,333 µS/cm, respectively.
- **Sulfur:** The total sulfur content of the feed coal and coal ash samples is 0.18 and 0.26 %S. The sulfide sulfur content of the samples (as measured in the Scr test) is 0.01 and 0.003 %S. The sulfide sulfur value is significantly less than the total sulfur value, indicating that most of the sulfur is likely to be present as other forms of sulfur such as organic sulfur and sulfate which, in comparison to a reactive sulfur form such as pyrite, has negligible capacity to generate acidity if exposed to oxidising conditions. The sulfide sulfur values are very low compared to average crustal abundance (0.1 %S) for this element (INAP, 2009). Materials with a total sulfur content less than or equal to 0.1 %S are essentially barren of sulfur, generally represent background concentrations, and have negligible capacity to generate acidity.

Based upon the sulfur data described above, it is expected that the bulk feed coal and coal ash materials at the project will have low sulfide sulfur content.

- **MPA:** The MPA for the bulk feed coal and coal ash samples is 0.31 and 0.09 kg H₂SO₄/t, respectively.
- **ANC:** The ANC for the bulk feed coal and coal ash samples is 19.5 and 26.4 kg H₂SO₄/t, respectively (*ie.* two orders of magnitude greater than the MPA).
- **NAPP:** The calculated NAPP value for the bulk feed coal and coal ash samples is -19.2 and -26.3 kg H₂SO₄/t.
- **ANC:MPA ratio:** The ANC:MPA ratio of the bulk feed coal and coal ash samples is 64 and 283, respectively. In simplistic terms, this means that the ANC is many times greater than the small amount of MPA that could theoretically be generated from the samples.

Generally those samples with a sulfide sulfur content of less than or equal to 0.1% and an ANC:MPA ratio of greater than 2 and are considered to represent material with a low to negligible risk of acid generation and a high factor of safety in terms of potential for AMD (DITR, 2007; INAP, 2009). The feed coal and coal ash samples therefore represent materials with a high factor of safety and very low risk of acid generation.

The ABA test data presented in **Table B-13 (Attachment B)** and discussed in this section has been used to classify the acid forming nature of the feed coal and coal ash materials. These classification criteria generally reflect Australian (DITR, 2007) and international (INAP, 2009) guideline criteria for classification of mine waste materials.

The ABA test results indicate that materials represented by both the feed coal and coal ash samples are classified as NAF-Barren, due to very a low sulfur content and elevated ANC.

6.2 Multi-Element and Nutrient Concentration in Coal Ash

Multi-element scans were carried out on the bulk coal ash sample to identify any elements (metals/metalloids) present in this material at concentrations that may be of environmental concern with respect to material handling, storage, and water quality. The results were compared to potentially relevant guideline criteria to determine any concerns related to power station WSF operation and final rehabilitation. To provide relevant context, RGS has compared the total metal/metalloid concentration in the bulk coal ash sample to the applied NEPC HIL(C) guidelines for soils in public open spaces (NEPC, 2013).

The results from multi-element testing (total metals/metalloids) of the bulk coal ash sample are presented in **Table B-14 (Attachment B)**. The results indicate that coal ash materials are likely to have low total metal and metalloid concentrations in solids, many below the laboratory LoR and all below the applied NEPC (HIL(C)) guideline for soils.

6.3 Assessment of Element Enrichment in Coal Ash

To provide additional context and in line with mining industry guidelines (DITR, 2007; INAP, 2009), the multi-element results described in **Section 6.2** were also compared to the average background concentration (average crustal abundance) of those elements (metal/metalloids) in soil and rock (Bowen, 1979; and INAP, 2009) (**Table B-14, Attachment B**). The GAI results indicate that the coal ash sample tested has GAI values less than 3 for all elements and are not enriched compared to average crustal abundance. The only exception is vanadium, which is slightly enriched in coal ash compared to average crustal abundance. It is expected that vanadium will be sparingly soluble in static and kinetic water quality leach tests, as described in **Section 6.4** and **6.5**, respectively.

6.4 Water Quality Static Leach Tests on Coal Ash

RGS has compared the multi-element results in a bottle leachate from the coal ash sample with Australian guidelines and relevant receiving water quality criteria. Surface water quality impacts are addressed in the EIS Surface Water Section.

It should also be recognised that direct comparison of geochemical data with guideline values can be misleading. For the purpose of this study, guideline values are only provided for broad context and should not be interpreted as arbitrary 'maximum' values or 'trigger' values.

The results from multi-element testing of bottle leachate from the bulk coal ash sample are presented in **Table B-15 (Attachment B)**.

The concentration of trace metals/metalloids in the bottle leachate from the coal ash sample is mostly below the laboratory LoR, although aluminium, boron, copper and zinc are present at levels which exceed the applied freshwater ecosystem water quality guideline criteria for 95 % species protection. The trace metal/metalloid concentrations in the bottle leachate are all less than the applied livestock drinking water quality guideline criteria (ANZECC & ARCANZ, 2000).

Guideline values for nutrients are only available for ammonia, total cyanide, nitrate and nitrite. Most of these nutrients in the bottle leachate from the coal ash sample were present at concentrations well below the applied guideline values. The concentration of total cyanide was also relatively low, but still exceeded the applied freshwater ecosystem water quality guideline criterion for 95 % species protection (0.007 mg/L). Guideline values are not available for other nutrients (P, TKN and Total N), however the concentrations of these parameters are low in all samples.



Overall, results indicate that dissolved metal/metalloid and nutrient concentrations in initial surface runoff and seepage from coal ash materials is likely to be low and less than applied livestock drinking water quality guideline criteria.

6.5 Radioactive Elements in Coal Ash

Some trace elements commonly found in coal ash are naturally radioactive, such as uranium (U), thorium (Th) and their decay products, such as potassium (K), polonium (Po), lead (Pb), radium (Ra) and radon (Rn). The radionuclide content of coal is usually below the content of local soil, but this depends on where the mine is located. Furthermore, the radionuclide content of coal combustion ash is generally greater than the source coal (Cooper, 2005). Cooper also reported various background levels for coal and coal combustion ash throughout Australia, and also background levels for natural soils and rocks. The data indicate that most coals and combustions ash have radionuclide levels below or within the range typically found naturally in soils and rocks. Coal and combustion ash from Queensland had average radionuclide content compared to other Australian states, however there is a wide range of values for coal combustion ash in Queensland, and other Australian states.

The results of a screening level analyses of the gross alpha and gross beta activity in bottle leachate from the coal ash sample are provided in **Table B-15 (Attachment B)**. The results demonstrate that the radionuclide activities for gross alpha and gross beta (and potassium-40 corrected beta) are less than the laboratory LoR. These results were also supported by soluble uranium and thorium concentrations in bottle leachate from the coal ash sample at levels below the laboratory LOR. The screening levels are very low, such that it is not necessary to undertake a detailed radionuclide assessment for the coal ash sample.

6.6 Water Quality Kinetic Leach Tests

As described in **Section 3.4.2** and **Attachment A**, KLC tests were undertaken on duplicate sub-samples of the bulk coal ash sample over a 26 week period (Sample Numbers KLC9 and KLC10). The KLC results are presented in **Attachment D** and interpreted in this section.

The KLC leachate concentrations are presented alongside ANZECC & ARCANZ (2000) guideline values for protection of aquatic ecosystems and livestock drinking water quality. These guidelines are provided for context only and are not intended to be interpreted as “maximum permissible levels” for site water storage or discharge. It should be noted that the ratio of sample to water in most of the KLC tests is approximately 1:1 (w/v) (i.e. concentrated), whereas the ratio of sample to water generally used in tests where results can (arbitrarily) be compared against guideline concentrations to provide relevant context is five times more dilute at 1:5 (w/v). Whilst arbitrary comparisons against guideline concentrations can be useful in some situations and help to provide relevant context, such comparisons cannot be directly extrapolated to the field situation at the project.

6.6.1 pH, Acidity and Alkalinity

The KLC leachate pH trends for coal ash in **Attachment D** show whilst the initial leachate pH is alkaline it approaches a neutral pH value of between 7 and 8 after nine weeks of leaching and then remains fairly consistent over the remainder of the 26 week test period. Contact with coal ash adds alkalinity to the deionised water used in the KLC tests, as the typical pH of the deionised water used in the test was in the pH range 5.5 to 6.5.

The acidity of leachate from the KLC test materials is low (≤ 10 mg/L as CaCO_3) in all leachate samples. The alkalinity of leachate from the KLC tests is elevated (up to 244 mg/L as CaCO_3). In all cases, the alkalinity values exceed the acidity values leading to a positive net alkalinity value in

leachate for all samples. This alkalinity typically buffers the pH of contact water in the range pH 7 to 8, which is within the range required to provide at least 95% species protection in aquatic ecosystems (ANZECC & ARCANZ, 2000).

6.6.2 EC, Sulfate, and Nutrients

The EC value of leachate from the KLC tests ranges from 461 to 2,780 $\mu\text{S}/\text{cm}$ and has a median value of 907 $\mu\text{S}/\text{cm}$. The EC shows a decreasing trend towards an equilibrium value over the test period. After 26 weeks of leaching under ideal oxidising (wetting and drying) conditions, the EC value in KLC leachate is less than 600 $\mu\text{S}/\text{cm}$.

The concentration of sulfate in leachate from the KLC tests also shows a decreasing trend towards an equilibrium value of below 300 mg/L and is less than the applied guideline value (1,000 mg/L) for livestock drinking water (ANZECC & ARCANZ, 2000).

The concentration of nutrients in leachate from the KLC tests is generally low, typically less than the laboratory LoR, and less than applied water quality guideline values, where these exist.

6.6.3 Sulfide Oxidation Rate

The sulfate generation rate results obtained for the KLC test on duplicate coal ash samples has been used to determine the rate of sulfide oxidation in these materials. The sulfate generation rate and associated sulfide oxidation rate for the KLC tests are shown in **Table 11**.

Table 11: Sulfate Generation and Sulfide Oxidation Rates for KLC Tests on Coal Ash

RGS-KLC Sample No.	Sample Description	Sulfate Generation Rate (mg/kg/week)	Oxidation Rate (kg O ₂ /m ³ /s)
KLC 9	Coal Ash 1	5.9	5.1×10^{-9}
KLC 10	Coal Ash 2	10.3	8.8×10^{-9}

The sulfate generation rate from the coal ash samples ranges from 5.9 to 10.3 mg/kg/week indicating that the rate of sulfide oxidation is relatively low in this material (equivalent to an oxidation rate ranging from 5.1×10^{-9} to 8.8×10^{-9} kg O₂/m³/s). The coal ash therefore has a low oxidation rate which reflects the NAF classification of this material predicted from static geochemical test results presented in **Section 6.1**.

6.6.4 Metals and Metalloids

The concentration of soluble trace metals/metalloids in leachate from the two KLC tests on coal ash are typically low, below the laboratory LoR, and within applied guidelines for the protection of aquatic ecosystems and livestock drinking water quality (ANZECC & ARCANZ, 2000). Whilst the concentrations of aluminium, cadmium, chromium and copper can be elevated in initial KLC leachate compared to applied water quality guideline values, the concentrations of these elements are within applied guideline values by the second KLC leaching event. The selenium and fluoride concentrations can also be marginally elevated in a few leachate samples compared to the applied guideline values. The most persistently elevated element concentrations in KLC leachate compared to applied water quality guideline values are boron and molybdenum, although both elements show decreasing concentration trends over the 26 week test period.

As noted at the start of this section, the ratio of sample to water in the KLC tests is 1:1 (w/v), whereas the ratio of sample to water used in other tests where arbitrary comparisons can be made against water quality guideline concentrations is generally 1:5 (w/v). In addition, the KLC tests are



performed on “as received” sample material with a relatively large exposed surface area and are tested under fully oxidised free-draining (alternating wet and dry) conditions which typically represent a “worst-case” scenario, analogous to near-surface materials at a coal ash WSF.

The concentrations of a few metals/metalloids such as those described in this section can generally be detected in slightly elevated concentrations compared to applied water quality guideline values in leachate from coal ash generated at power stations in Australia, and typically have concentrations below applied water quality guideline concentrations in field situations.

Overall, results indicate that dissolved metal/metalloid and nutrient concentrations in ongoing surface runoff and seepage from coal ash materials is likely to be relatively low and generally less than applied livestock drinking water quality guideline criteria.

Whilst it is expected that surface runoff and seepage from the coal ash stored at the power station WSF is unlikely to significantly impact upon the quality of surface and groundwater resources, it is recommended that the dissolved metals/metalloids described in this report be included in the water quality monitoring program for the power station WSF to ensure that this is the case.

6.7 Management Measures

Based on the benign nature of the feed coal and coal ash, no special management measures are required for the handling or storage of these materials at the feed coal stockpile or at the power station WSF.

Surface water and seepage from the feed coal stockpile and power station WSF will be monitored to ensure that key water quality parameters remain within appropriate criteria. The proponent will:

- Monitor surface run-off and seepage from the proposed feed coal stockpile and power station WSF for pH, EC, TSS and the range of dissolved trace metals/metalloids and major ions described in this report on a quarterly basis; and
- Groundwater monitoring will also be undertaken in accordance with the program described in the EIS Groundwater Report.

7 CONCLUSIONS

RGS has completed a geochemical assessment of mine and power station waste materials likely to be generated from the project. The coal samples used to generate coal reject materials have also been included in the assessment. The main findings of the geochemical assessment are presented in the following sections:

7.1 Overburden

- The overburden materials show excess acid buffering capacity and a high factor of safety with respect to potential for acid generation;
- The bulk excavated overburden material generated by the project will have a significant excess buffering capacity several times greater than the MPA and is therefore considered to be NAF;
- The overburden has low sulfide sulfur content and is therefore not expected to generate AMD or NMD.
- The concentrations of metals/metalloids in excavated overburden materials will be low, within relevant health-based criteria for soils, and therefore unlikely to present any environmental issues associated with revegetation and rehabilitation activities;
- Surface runoff and seepage from excavated overburden materials is likely to exhibit low acidity and be slightly alkaline. Salinity will be low due to a low level of dissolved solids;
- Static and kinetic leach tests indicate that trace metals/metalloids and major ions will be sparingly soluble in surface runoff and seepage from excavated overburden material. Dissolved concentrations will remain within applied water quality guideline criteria and will not present any significant environmental risks for on-site or downstream water quality. Dilution effects from rainfall and natural attenuation are also likely to occur in the field and further reduce the concentrations of soluble metals and metalloids in surface runoff and seepage.
- Overburden materials are likely to have low sodicity levels and therefore have a relatively low risk of being susceptible to significant dispersion and erosion;
- Whilst fertiliser and gypsum addition could be considered for some overburden materials, such amelioration measures may not be required for bulk spoil materials to provide a reasonable growth medium for revegetation and rehabilitation works.
- Based on the benign nature of the overburden materials, no special management measures are required for their handling and storage in the OEA.
- Surface and groundwater monitoring programs will be designed to ensure any unexpected water quality due to overburden geochemistry is detected.

7.2 Coal Reject and Raw Coal

- The coal reject and raw coal materials show excess acid buffering capacity and a high factor of safety with respect to potential for acid generation;
- The bulk coal reject and raw coal materials generated by the project will have a significant excess buffering capacity almost an order of magnitude greater than the MPA and are therefore considered to be NAF;
- The coal reject and raw coal materials have low sulfide sulfur content and are therefore not expected to generate AMD or NMD.



- The concentrations of metals/metalloids in coal reject and raw coal materials will be low, within relevant heath-based criteria for soils, and therefore unlikely to present any environmental issues associated with revegetation and rehabilitation activities at the OEA or TSF;
- Surface runoff and seepage from coal reject and raw coal materials is likely to exhibit low acidity and be slightly alkaline. Salinity will be low due to a low level of dissolved solids;
- Static and kinetic leach tests indicate that trace metals/metalloids and major ions will be sparingly soluble in surface runoff and seepage from coal reject and raw coal materials. Dissolved concentrations will remain within applied water quality guideline criteria and will not present any significant environmental risks for on-site or downstream water quality. Dilution effects from rainfall and natural attenuation are also likely to occur in the field and further reduce the concentrations of soluble metals and metalloids in surface runoff and seepage.
- Based on the benign nature of the coal reject and raw coal materials, no special management measures are required for their handling and permanent (or temporary) storage at the project.
- Surface water and seepage from the OEA, TSF and raw coal stockpile areas will be monitored to ensure that key water quality parameters, including selenium, remain within appropriate criteria. Groundwater monitoring will also be undertaken.

7.3 Power Station Feed Coal and Coal Ash

- The bulk feed coal and coal ash materials show excess acid buffering capacity and a high factor of safety with respect to potential for acid generation;
- The bulk feed coal and coal ash materials generated by the project will have a significant excess buffering capacity more than an order of magnitude greater than the small amount of MPA and are therefore considered to be NAF;
- The bulk feed coal and coal ash materials have low sulfide sulfur content and are therefore not expected to generate AMD or NMD.
- The concentrations of metals/metalloids in the bulk coal ash materials will be low, within relevant heath-based criteria for soils, and therefore unlikely to present any environmental issues associated with revegetation and rehabilitation activities in the power station WSF;
- The concentration of nutrients in the bulk coal ash materials stored at the power station WSF is likely to be low;
- The radionuclide content of the bulk coal ash materials stored at the power station WSF is likely to be low;
- Surface runoff and seepage from bulk coal ash materials is likely to exhibit low acidity and be slightly alkaline. Salinity will be low due to a low level of dissolved solids;
- Static and kinetic leach tests indicate that trace metals/metalloids and major ions will be sparingly soluble in surface runoff and seepage from coal ash materials. Dissolved concentrations will generally remain within applied livestock drinking water quality guideline criteria although the concentrations of boron and molybdenum should be monitored to ensure that these elements do not present any environmental risks for on-site or downstream water quality. Dilution effects from rainfall and natural attenuation are also likely to occur in the field and further reduce the concentrations of soluble metals and metalloids in surface runoff and seepage.

-
- Based on the relatively benign nature of the feed coal and coal ash materials, no special management measures are required for their handling and storage at the feed coal stockpiles or power station WSF.
 - Surface water and seepage from the feed coal stockpile and WSF areas will be monitored to ensure that key water quality parameters remain within appropriate criteria. Groundwater monitoring will also be undertaken.

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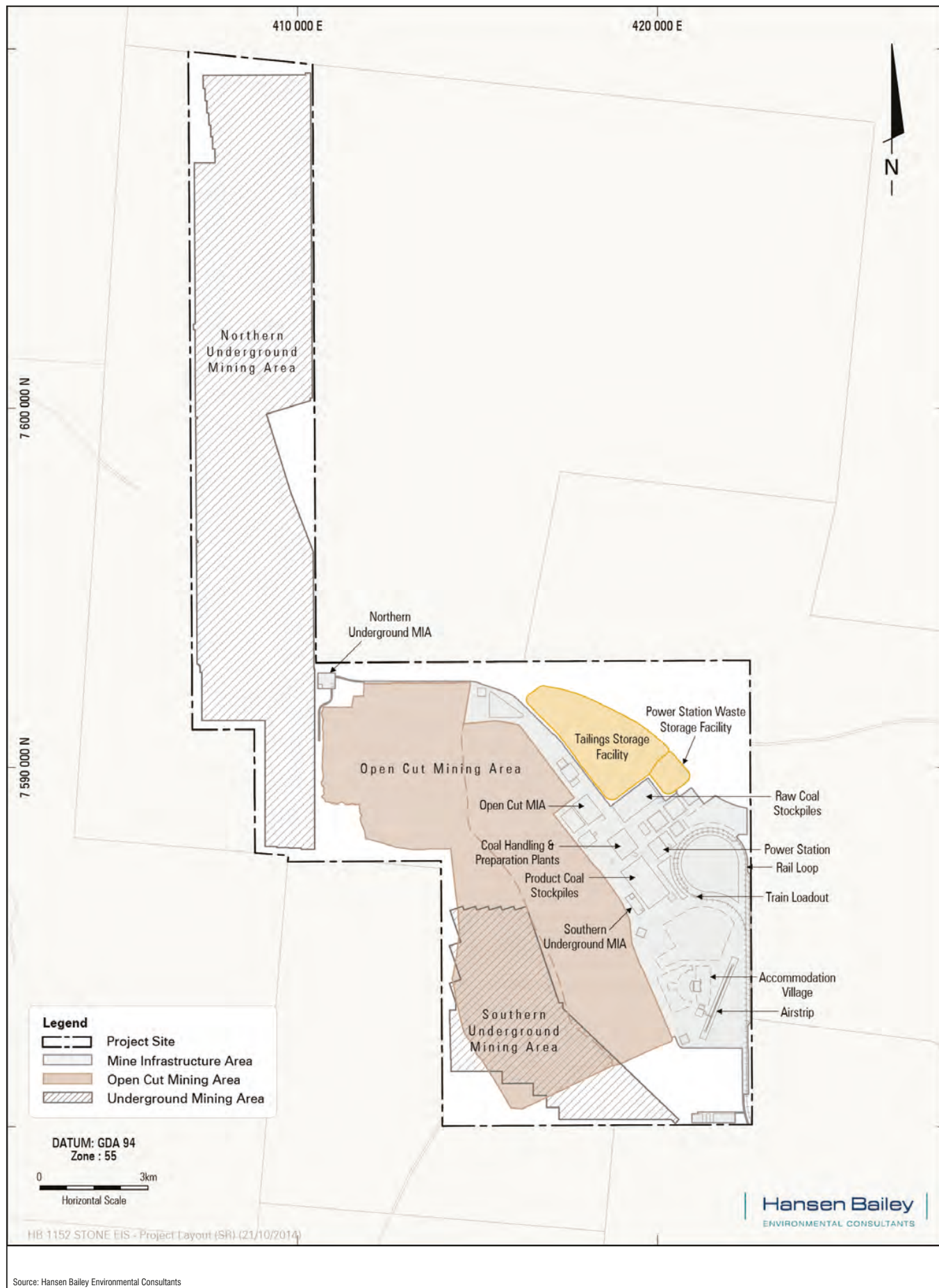
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Figures



Source: Hansen Bailey Environmental Consultants



Source: Hansen Bailey Environmental Consultants

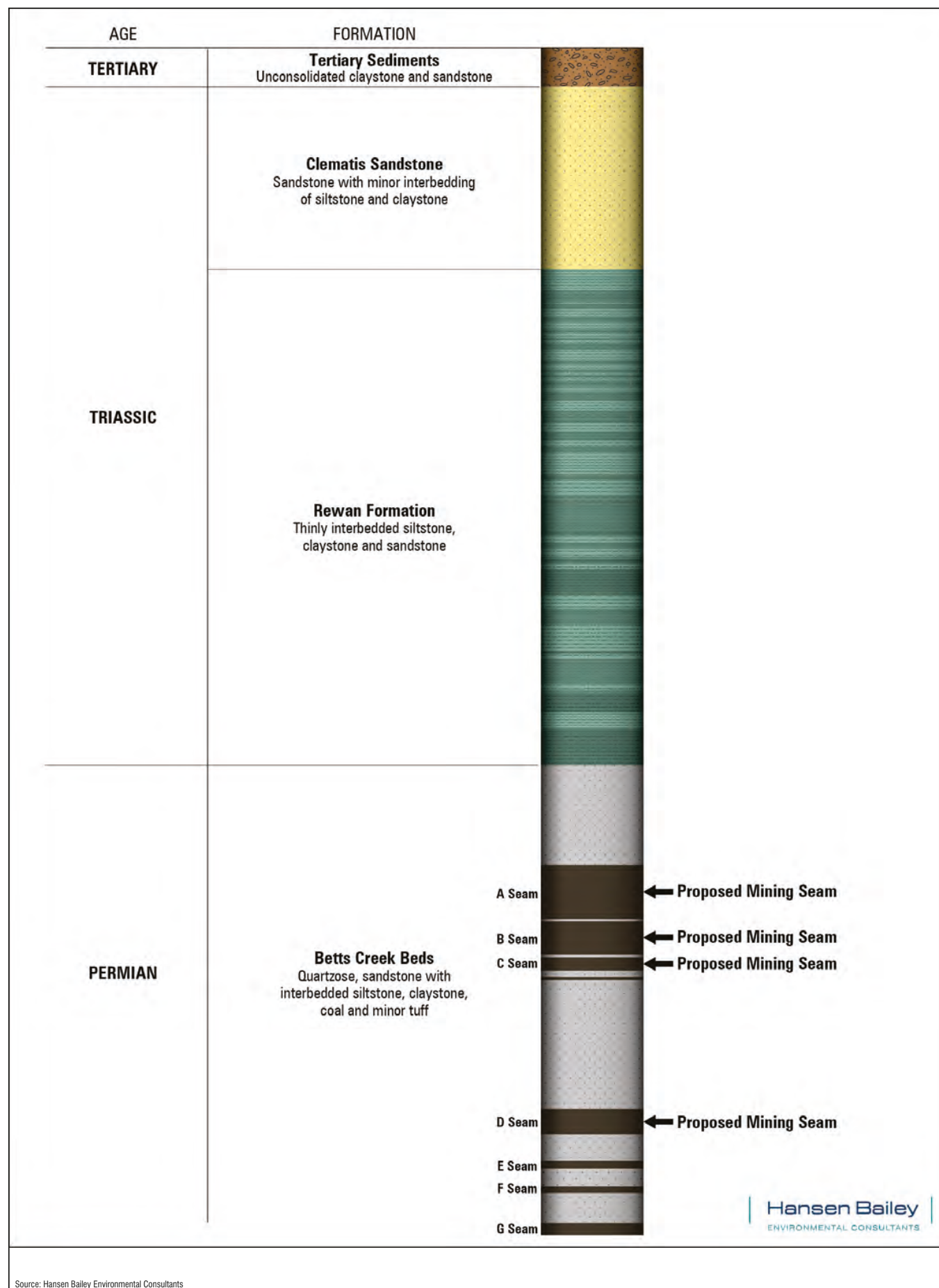
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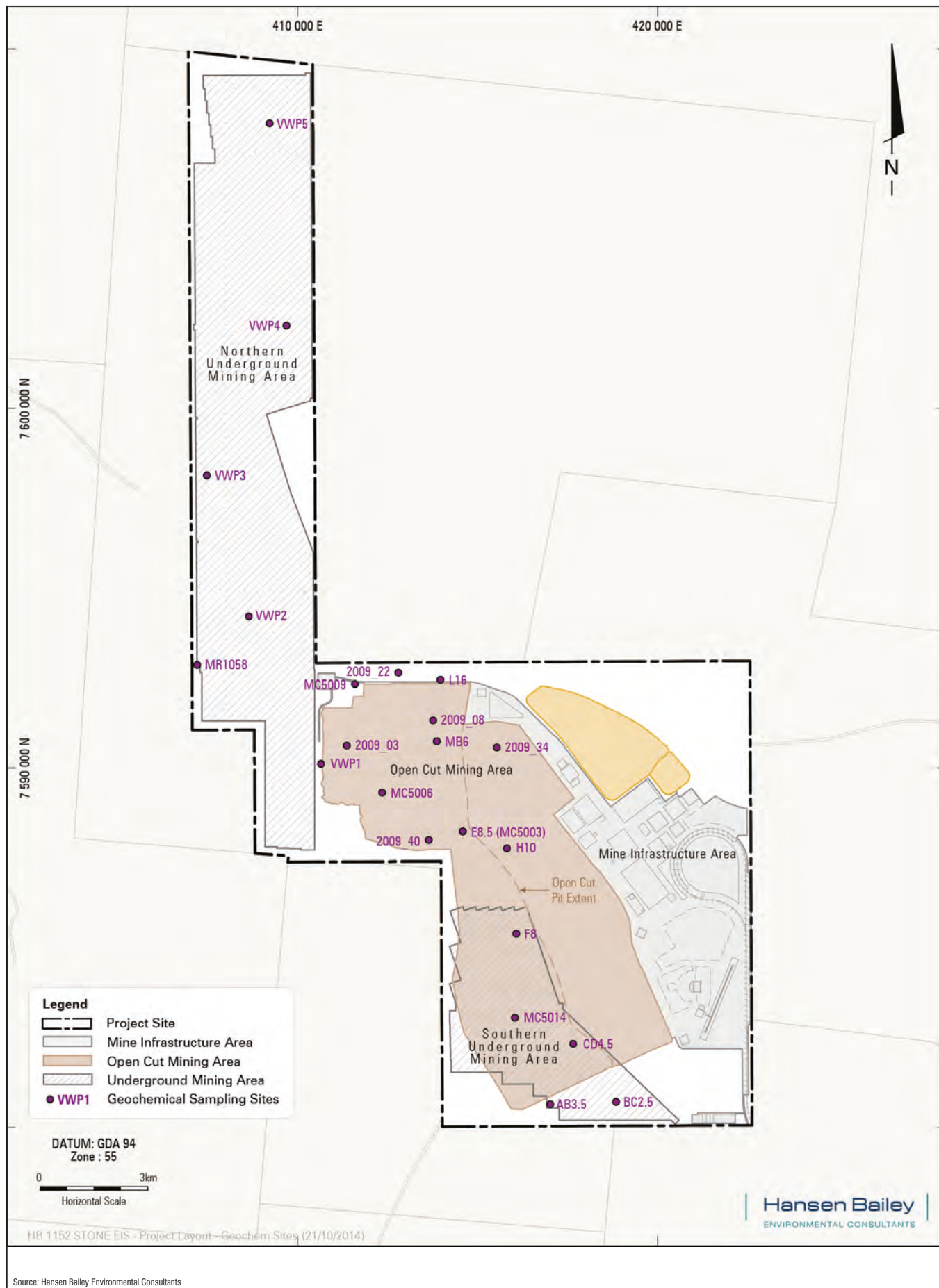
PROJECT CHINA STONE

**GEOCHEMICAL ASSESSMENT OF
MINE AND POWER STATION WASTE MATERIALS**

Figure: 2
PROJECT LAYOUT



Source: Hansen Bailey Environmental Consultants



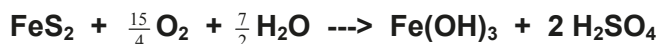
Attachment A

Geochemical Assessment Methodology for Mine Waste Materials



A1. Acid Generation and Prediction

Acid generation is caused by the exposure of sulfide minerals, most commonly pyrite (FeS_2), to atmospheric oxygen and water. Sulfur assay results are used to calculate the maximum amount of acid that could be generated by the sample, as a direct stoichiometric function of either the pyritic sulfur content, or by assuming that all sulfur not present as sulfate occurs as pyrite. Pyrite reacts under oxidising conditions to generate acid according to the following overall reaction:



According to this reaction, the maximum potential acidity (MPA) of a sample containing one per cent sulfur as pyrite would be 30.6 kg $\text{H}_2\text{SO}_4/\text{t}$; i.e. 30.6 kg of acid generated per tonne of rock.

The chemical components of the acid generation process consist of the above sulfide oxidation reaction and acid neutralisation, which is mainly provided by inherent carbonates and to a lesser extent silicate materials. The amount and rate of acid generation is determined by the interaction and overall balance of the acid generation and neutralisation components.

Determination of pH and Electrical Conductivity

pH and electrical conductivity (EC) are measured (and reported) on 1:5 weight/weight water extract. This gives an indication of the inherent acidity and salinity of the mineral waste material when initially exposed in an emplacement area.

Total sulfur (S), chromium-reducible sulfur (S_{CR}) and Maximum Potential Acidity (MPA)

Total sulfur concentration is determined by the LECO high temperature combustion method. The total sulfur is typically used to calculate the Maximum Potential Acidity (MPA), which is based on the assumption that all sulfur is present as reactive pyrite.

A more accurate estimate of the MPA can be achieved by determining pyritic sulfur and other sulfide forms directly, such as using the chromium-reducible sulfur (S_{CR}) test. S_{CR} is determined by the reduction of inorganic sulfur in a hot acidic chromous chloride solution, where evolved H_2S is carried in nitrogen gas and trapped in a zinc acetate trapping solution as zinc sulfide. This solution is then titrated with iodine. For the Project, S_{CR} was used instead of total sulfur to determine MPA, where S_{CR} data was available.

Acid neutralising capacity (ANC)

The ANC measures the capacity of a sample to react with and neutralise acid by addition of acid to a known weight of sample, then titration with NaOH to determine the amount of residual acid. The ANC can be further evaluated by slow acid titration to a set end-point and then calculation of the amount of acid consumed and evaluation of the resultant titration curve, called an Acid Buffering Characteristic Curve (ABCC).

Net acid producing potential (NAPP)

The NAPP is calculated from the MPA and ANC results and represents the balance between the inherent capacity of a sample to generate acid (MPA) and neutralise acid (ANC). If the MPA is greater than the ANC (i.e. a net excess of acidity) then the NAPP is positive. If the MPA is less than the ANC (i.e. a net excess of alkalinity) then the NAPP is negative. A strongly positive NAPP result generally indicates that a sample is PAF, whereas a strongly negative NAPP generally indicates that a sample is NAF. The NAPP result is expressed in units of kg $\text{H}_2\text{SO}_4/\text{t}$ of sample.

Net acid generation (NAG)

The standard NAG tests can sometimes be used to confirm the acid forming nature for coal mine waste materials, but should generally be used with caution as it can generate false positive results if the sample material contains a significant amount of organic materials (ACARP, 2008). The extended boil NAF test can address this issue, but it is difficult to complete and to interpret the acquired results.

A2. Assessment of Element Enrichment and Solubility

In mineralised areas it is common to find a suite of enriched elements that have resulted from natural geological processes. Multi-element scans are carried out to identify any elements that are present in a material at concentrations that may be of environmental concern with respect to surface water quality and revegetation. The samples are typically analysed for the following elements, although the actual suite of elements tested is project specific:

Major elements	Al, Ca, Fe, K, Mg, Na, Si, and S
Minor elements	As, B, Cd, Co, Cr, Cu, F, Hg, Mn, Mo, Ni, P, Pb, Sb, Se, Zn

The assay result for each element is compared to either average background concentrations to evaluate any potential concerns related to rock emplacement or process residue facility operation and final rehabilitation, or compared to soil quality guidelines where applicable.

Elements identified as enriched may not necessarily be a concern for revegetation, drainage water quality, or public health but their significance should be evaluated. Similarly, because an element is not enriched does not mean it will never be a concern, because under some conditions (eg. low pH) the geochemical behaviour of common environmentally important elements such as Al, Cu, Cd, Fe and Zn increases significantly.

Water extracts or leaching tests can be used to determine the element solubilities under the existing pH conditions of the sample (eg. bottle leaching tests) or under changing conditions (eg. kinetic leach column tests). Where applicable, element concentrations in water extracts or leachates have been compared with applied water quality guidelines to determine their potential environmental significance.

A3. Kinetic Leach Column Tests

Kinetic leach column tests can be used to provide information on the reaction kinetics of mine waste materials. The major objectives of kinetics tests are to:

- Provide time-dependent data on the kinetics and rate of acid generation and acid neutralising reactions under laboratory controlled (or onsite conditions);
- Investigate metal release and drainage / seepage quality; and
- Assess treatment options such as addition of alkaline materials.

The kinetic tests simulate the weathering process that leads to acid and base generation and reaction under laboratory controlled or site conditions. The kinetic tests allow an assessment of the acid forming characteristics and indicate the rate of acid generation, over what period it will occur, and what management controls may be required.

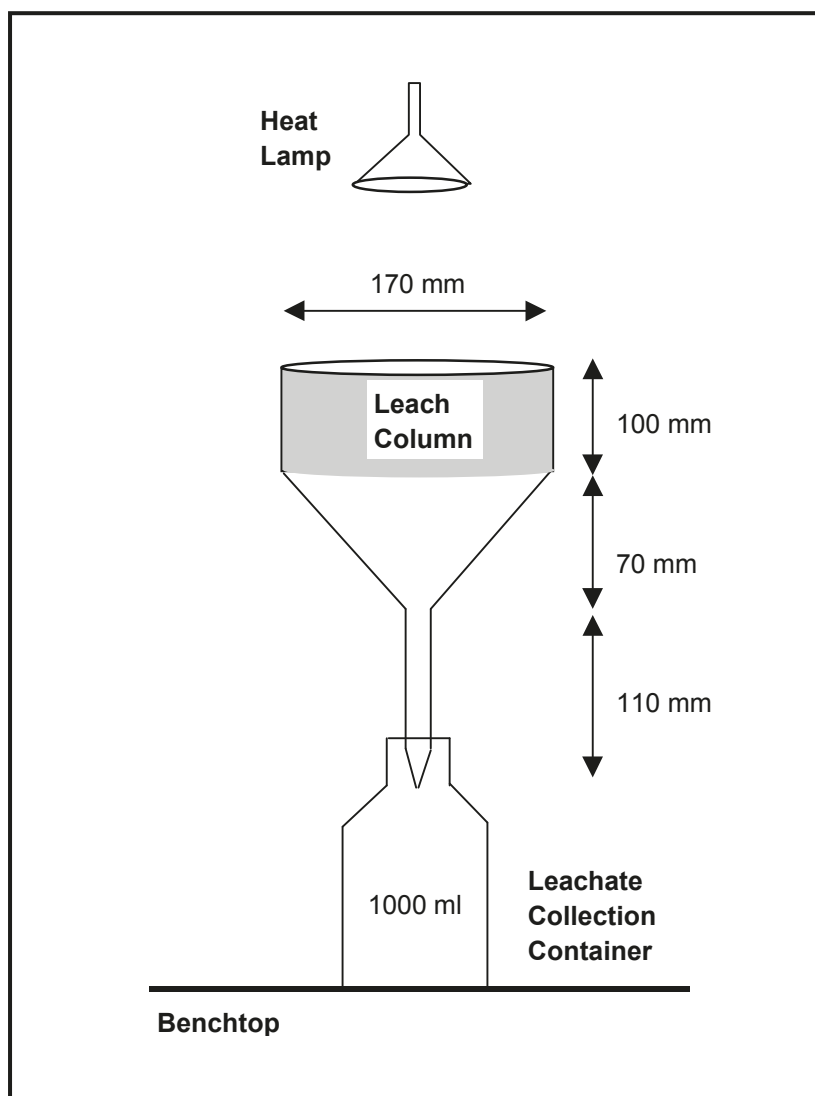
In kinetic column leach tests, water is added to a sample and used to leach the products and by-products of acid producing and consuming reactions. Samples of leachate are then collected and analysed. Intermittent water application is applied to simulate rainfall and heat lamps are used to simulate sunshine. These tests provide real-time information and may have to continue for several months or years. Monitoring includes trends in pH, sulfate, acidity or alkalinity, and metals/metalloids, for example. The pH of the collected leachate simulates the acid drainage process, acidity or alkalinity levels indicate the rate of acid production and acid neutralisation, and sulfate production can be related to the rate of sulfide oxidation. Metal/metalloid concentration data provides an assessment of metal solubility and leaching behaviour.

Figure A1 shows the kinetic leach column set up used by RGS adapted from *AMIRA, 2002*. The columns are placed under heat lamps to allow the sample to dry between water additions to ensure adequate oxygen ingress into the sample material.

Approximately 2 kg of sample is generally used in the leach columns and depending on the physical nature of the material and particle size can be used on an as-received basis (*i.e.* no crushing as with fine rejects) or crushed to nominal 5 to 10 mm particle size (as with overburden).

The sample in the column is initially leached with deionised water at a rate of about 400 ml/kg of sample and the initial leachate from the columns collected and analysed. Subsequent column leaching is carried out at a rate of about 400 ml/kg per month and again collected and analysed. The leaching rate can be varied to better simulate expected site conditions or satisfy test program data requirements. The column must be exposed to drying conditions in between watering events. The residual water content and air void content in the column can be determined by comparing the wet and dry column weights. A heat lamp is generally used above the sample during daylight hours to maintain the leach column surface temperature at about 30°C.

Figure A1
Kinetic Leach Column Setup



Reference:

AMIRA (2002). AMIRA International. *ARD Test Handbook. Project P387A Prediction & Kinetic Control of Acid Mine Drainage*. Ian Wark Institute and Environmental Geochemistry International Pty Ltd. May 2002, Melbourne, VIC.

Attachment B

Static Geochemical Test Results



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Table B1: Acid Base Account Results for Overburden Materials

RGS Sample No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth					(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
OVERBURDEN																		
1	EB1227477061	AMD061	MC5003	0.0	15.0	15.0	Drill Chip	Overburden	Soil and Gravel	7.3	184	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
2	EB1227477062	AMD062	MC5003	16.0	25.0	9.0	Drill Chip	Overburden	Sandstone	7.1	246	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
3	EB1227477063	AMD063	MC5003	26.0	40.0	14.0	Drill Chip	Overburden	Sandstone	7.6	250	0.005		0.2	1.4	-1.2	9.1	NAF (Barren)
4	EB1227477064	AMD064	MC5003	41.0	55.0	14.0	Drill Chip	Overburden	Sandstone	7.3	270	0.005		0.2	1.2	-1.0	7.8	NAF (Barren)
5	EB1227477065	AMD065	MC5003	56.0	86.0	30.0	Drill Chip	Overburden	Claystone	7.2	305	0.005		0.2	1.6	-1.4	10.4	NAF (Barren)
6	EB1227477066	AMD066	MC5003	90.1	90.5	0.4	Drill Core	Overburden	Claystone	7.0	140	0.005		0.2	7.1	-6.9	46.4	NAF (Barren)
7	EB1227477031	AMD031	MC5006	0.0	12.0	12.0	Drill Chip	Overburden	Soil and Clay	5.8	1300	0.03		0.9	0.3	0.7	0.3	NAF (Barren)
8	EB1227477032	AMD032	MC5006	13.0	29.0	16.0	Drill Chip	Overburden	Clay	6.3	1320	0.04		1.2	1.2	0.03	1.0	NAF (Barren)
9	EB1227477033	AMD033	MC5006	30.0	40.0	10.0	Drill Chip	Overburden	Sandstone	6.8	1320	0.005		0.2	0.5	-0.3	3.3	NAF (Barren)
10	EB1227477034	AMD034	MC5006	41.0	67.0	26.0	Drill Chip	Overburden	Sandstone	6.8	422	0.08		2.5	0.3	2.2	0.1	NAF (Barren)
11	EB1227477035	AMD035	MC5006	68.0	80.0	12.0	Drill Chip	Overburden	Claystone	6.7	371	0.02		0.6	2.8	-2.2	4.6	NAF (Barren)
12	EB1227477036	AMD036	MC5006	90.0	100.0	10.0	Drill Chip	Overburden	Claystone	8.9	633	0.02		0.6	9.2	-8.6	15.0	NAF (Barren)
13	EB1227477037	AMD037	MC5006	110.0	120.0	10.0	Drill Chip	Overburden	Claystone	8.7	418	0.02		0.6	11.8	-11.2	19.3	NAF (Barren)
14	EB1227477038	AMD038	MC5006	130.0	140.0	10.0	Drill Chip	Overburden	Claystone	9.0	401	0.005		0.2	12.6	-12.4	82.3	NAF (Barren)
15	EB1227477039	AMD039	MC5006	150.0	160.0	10.0	Drill Chip	Overburden	Sandstone	9.1	318	0.02		0.6	47.0	-46.4	76.7	NAF (Barren)
16	EB1227477040	AMD040	MC5006	170.0	180.0	10.0	Drill Chip	Overburden	Siltstone	9.0	317	0.005		0.2	11.8	-11.6	77.1	NAF (Barren)
17	EB1227477041	AMD041	MC5006	190.0	205.0	15.0	Drill Chip	Overburden	Siltstone	8.8	415	0.02		0.6	32.6	-32.0	53.2	NAF (Barren)
18	EB1227477042	AMD042	MC5006	212.9	213.8	1.0	Drill Core	Overburden	Sandstone	9.4	119	0.005		0.2	108.0	-107.8	705.3	NAF (Barren)
19	EB1227477043	AMD043	MC5006	222.0	222.3	0.3	Drill Core	Overburden	Siltstone	9.4	165	0.005		0.2	9.7	-9.5	63.3	NAF (Barren)
20	EB1227477044	AMD044	MC5006	227.2	227.5	0.4	Drill Core	Overburden	Sandstone	9.5	133	0.005		0.2	274.0	-273.8	1789.4	NAF (Barren)
21	EB1227477045	AMD045	MC5006	233.9	234.2	0.3	Drill Core	Overburden	Siltstone	9.0	104	0.02		0.6	7.0	-6.4	11.4	NAF (Barren)
22	EB1227477046	AMD046	MC5006	238.6	238.9	0.3	Drill Core	Overburden	Sandstone	9.0	192	0.01		0.3	7.1	-6.8	23.2	NAF (Barren)
23	EB1227477001	AMD001	MC5009	0.0	10.0	10.0	Drill Chip	Overburden	Soil and Clay	5.5	142	0.005		0.2	1.4	-1.2	9.1	NAF (Barren)
24	EB1227477002	AMD002	MC5009	10.0	20.0	10.0	Drill Chip	Overburden	Clay	7.4	293	0.005		0.2	6.1	-5.9	39.8	NAF (Barren)
25	EB1227477003	AMD003	MC5009	20.0	29.0	9.0	Drill Chip	Overburden	Clay	8.0	334	0.005		0.2	8.2	-8.0	53.6	NAF (Barren)
26	EB1227477004	AMD004	MC5009	31.0	40.0	9.0	Drill Chip	Overburden	Siltstone	8.9	441	0.03		0.9	28.9	-28.0	31.5	NAF (Barren)
27	EB1227477005	AMD005	MC5009	50.0	60.0	10.0	Drill Chip	Overburden	Sandstone	9.0	400	0.02		0.6	23.0	-22.4	37.6	NAF (Barren)
28	EB1227477006	AMD006	MC5009	70.0	80.0	10.0	Drill Chip	Overburden	Sandstone	9.1	314	0.02		0.6	32.9	-32.3	53.7	NAF (Barren)
29	EB1227477007	AMD007	MC5009	90.0	100.0	10.0	Drill Chip	Overburden	Siltstone	8.9	378	0.02		0.6	30.1	-29.5	49.1	NAF (Barren)
30	EB1227477008	AMD008	MC5009	110.0	120.0	10.0	Drill Chip	Overburden	Siltstone	8.9	337	0.02		0.6	49.9	-49.3	81.5	NAF (Barren)
31	EB1227477009	AMD009	MC5009	130.0	139.0	9.0	Drill Chip	Overburden	Sandstone	8.7	421	0.01		0.3	65.0	-64.7	212.2	NAF (Barren)
32	EB1227477010	AMD010	MC5009	146.3	146.7	0.4	Drill Core	Overburden	Sandstone	9.4	151	0.005		0.2	76.4	-76.2	498.9	NAF (Barren)
33	EB1227477011	AMD011	MC5009	155.9	156.3	0.4	Drill Core	Overburden	Siltstone	9.2	146	0.02		0.6	10.9	-10.3	17.8	NAF (Barren)
34	EB1231346001	AMD074	MC5014 (CD6)	2.2	2.5	0.3	Drill Core	Overburden	Gravel	5.8	275	0.02		0.6	0.8	-0.2	1.3	NAF (Barren)
35	EB1231346002	AMD075	MC5014 (CD6)	10.9	11.1	0.2	Drill Core	Overburden	Sand	5.8	139	0.03		0.9	1.6	-0.7	1.7	NAF (Barren)
36	EB1231346003	AMD076	MC5014 (CD6)	12.0	29.0	17.0	Drill Chip	Overburden	Sand	5.8	212	0.005		0.2	0.9	-0.7	5.9	NAF (Barren)
37	EB1231346004	AMD077	MC5014 (CD6)	30.0	43.0	13.0	Drill Chip	Overburden	Sand	5.9	165	0.02		0.6	1.3	-0.7	2.1	NAF (Barren)

Table B1: Acid Base Account Results for Overburden Materials

RGS Sample No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹ (µS/cm)	Total S (%)	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth												
38	EB1231346005	AMD078	MC5014 (CD6)	44.0	54.0	10.0	Drill Chip	Overburden	Clayey Sand	5.9	449	0.02		0.6	0.8	-0.2	1.3	NAF (Barren)
39	EB1231346006	AMD079	MC5014 (CD6)	55.0	64.0	9.0	Drill Chip	Overburden	Clayey Sand	6.1	259	0.02		0.6	3.9	-3.3	6.4	NAF (Barren)
40	EB1231346007	AMD080	MC5014 (CD6)	64.0	74.0	10.0	Drill Chip	Overburden	Clayey Sand	7.1	258	0.005		0.2	7.1	-6.9	46.4	NAF (Barren)
41	EB1231346008	AMD081	MC5014 (CD6)	75.0	86.0	11.0	Drill Chip	Overburden	Clayey Sand	7.7	232	0.005		0.2	6.3	-6.1	41.1	NAF (Barren)
42	EB1231346009	AMD082	MC5014 (CD6)	87.0	100.0	13.0	Drill Chip	Overburden	Siltstone	8.3	398	0.01		0.3	10.3	-10.0	33.6	NAF (Barren)
43	EB1231346010	AMD083	MC5014 (CD6)	101.0	112.0	11.0	Drill Chip	Overburden	Siltstone	8.3	526	0.01		0.3	25.7	-25.4	83.9	NAF (Barren)
44	EB1231346011	AMD084	MC5014 (CD6)	113.0	124.0	11.0	Drill Chip	Overburden	Siltstone	8.5	470	0.02		0.6	66.1	-65.5	107.9	NAF (Barren)
45	EB1231346012	AMD085	MC5014 (CD6)	125.0	136.0	11.0	Drill Chip	Overburden	Siltstone	8.4	680	0.02		0.6	33.2	-32.6	54.2	NAF (Barren)
46	EB1231346013	AMD086	MC5014 (CD6)	144.6	144.9	0.3	Drill Core	Overburden	Sandstone/Siltstone	9.1	270	0.04		1.2	16.2	-15.0	13.2	NAF (Barren)
47	EB1231346014	AMD087	MC5014 (CD6)	152.1	152.4	0.3	Drill Core	Overburden	Siltstone	7.8	295	0.04		1.2	7.5	-6.3	6.1	NAF (Barren)
48	EB1313278001	AMD107	MC5016 (BC2.5)	0.0	9.0	9.0	Drill Chip	OverBurden	Sand	6.8	443	0.03		0.9	2.7	-1.8	2.9	NAF (Barren)
49	EB1313278002	AMD108	MC5016 (BC2.5)	9.0	36.0	27.0	Drill Chip	OverBurden	Clay	9.4	287	0.005		0.2	6.5	-6.3	42.4	NAF (Barren)
50	EB1313278003	AMD109	MC5016 (BC2.5)	36.0	40.0	4.0	Drill Chip	OverBurden	Silt	9.5	216	0.005		0.2	38.3	-38.1	250.1	NAF (Barren)
51	EB1313278004	AMD117	MC5016 (BC2.5)	52.7	52.9	0.2	Drill Core	OverBurden	Sandstone	9.0	145	0.03		0.9	125.0	-124.1	136.1	NAF (Barren)
52	EB1313278005	AMD118	MC5016 (BC2.5)	63.1	63.3	0.2	Drill Core	OverBurden	Siltstone	7.9	140	0.05		1.5	5.0	-3.5	3.3	NAF (Barren)
53	EB1313278006	AMD119	MC5016 (BC2.5)	74.2	74.4	0.2	Drill Core	OverBurden	Siltstone	7.7	138	0.03		0.9	6.0	-5.1	6.5	NAF (Barren)
54	EB1312454001	AMD098	MC5019 (H10)	0.0	7.0	7.0	Drill Chip	Overburden	Gravelly Soil	8.2	293	0.005		0.2	6.6	-6.4	43.1	NAF (Barren)
55	EB1312454002	AMD099	MC5019 (H10)	7.0	22.0	15.0	Drill Chip	Overburden	Gravelly Soil	8.4	254	0.005		0.2	5.9	-5.7	38.5	NAF (Barren)
56	EB1312454003	AMD100	MC5019 (H10)	22.0	34.0	12.0	Drill Chip	Overburden	Sand	8.0	190	0.005		0.2	1.0	-0.8	6.5	NAF (Barren)
57	EB1312454004	AMD101	MC5019 (H10)	34.0	42.0	8.0	Drill Chip	Overburden	Sand	7.7	183	0.005		0.2	0.9	-0.7	5.9	NAF (Barren)
58	EB1312454005	AMD102	MC5019 (H10)	46.0	60.0	14.0	Drill Chip	Overburden	Sand	11.5	3140	0.51		15.6	79.8	-64.2	5.1	NAF
59	EB1312454006	AMD103	MC5019 (H10)	60.0	67.0	7.0	Drill Chip	Overburden	Sand	11.5	1520	0.07		2.1	34.0	-31.9	15.9	NAF (Barren)
60	EB1312454007	AMD104	MC5019 (H10)	67.0	78.0	11.0	Drill Chip	Overburden	Clayey Sand	9.0	755	0.07		2.1	5.0	-2.9	2.3	NAF (Barren)
61	EB1312454015	AMD105	MC5019 (H10)	86.7	87.0	0.3	Drill Core	Overburden	Siltstone	9.5	206	0.05		1.5	29.0	-27.5	18.9	NAF (Barren)
62	EB1312454016	AMD106	MC5019 (H10)	90.0	90.3	0.3	Drill Core	Overburden	Claystone/Siltstone	9.2	277	0.04		1.2	16.8	-15.6	13.7	NAF (Barren)
63	EB1313889001	AMD143	MC5020A (L16)	0.0	10.0	10.0	Drill Chip	Overburden	Sand	5.7	221	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
64	EB1313889002	AMD144	MC5020A (L16)	11.0	31.0	20.0	Drill Chip	Overburden	Sand	6.5	268	0.005		0.2	1.1	-0.9	7.2	NAF (Barren)
65	EB1313889003	AMD145	MC5020A (L16)	32.0	49.0	17.0	Drill Chip	Overburden	Sandstone/Siltstone	8.7	281	0.03		0.9	29.5	-28.6	32.1	NAF (Barren)
66	EB1313889004	AMD146	MC5020A (L16)	50.0	60.0	10.0	Drill Chip	Overburden	Sandstone/Siltstone	6.3	157	0.03		0.9	7.9	-7.0	8.6	NAF (Barren)
67	EB1313885001	AMD159	MC5025A (MB6)	0.0	16.0	16.0	Drill Chip	Overburden	Sand	6.3	75	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
68	EB1313885002	AMD160	MC5025A (MB6)	17.0	28.0	11.0	Drill Chip	Overburden	Gravel	6.4	146	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
69	EB1313885003	AMD161	MC5025A (MB6)	29.0	48.0	19.0	Drill Chip	Overburden	Sand/Clay	7.9	301	0.02		0.6	3.5	-2.9	5.7	NAF (Barren)
70	EB1313885004	AMD162	MC5025A (MB6)	49.0	77.0	28.0	Drill Chip	Overburden	Claystone	7.2	199	0.03		0.9	0.3	0.7	0.3	NAF (Barren)
71	EB1313885005	AMD163	MC5025A (MB6)	97.4	97.6	0.2	Drill Core	Overburden	Sandstone	8.9	159	0.03		0.9	398.0	-397.1	433.2	NAF (Barren)
72	EB1316687001	AMD195	MC5026 (VWP1)	0.0	18.0	18.0	Drill Chip	Overburden	Sand	6.6	472	0.03		0.9	1.8	-0.9	2.0	NAF (Barren)
73	EB1316687002	AMD196	MC5026 (VWP1)	18.0	26.0	8.0	Drill Chip	Overburden	Clay	7.1	515	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
74	EB1316687003	AMD197	MC5026 (VWP1)	26.0	36.0	10.0	Drill Chip	Overburden	Clay / Sand	7.3	364	0.04		1.2	0.3	1.0	0.2	NAF (Barren)
75	EB1316687004	AMD198	MC5026 (VWP1)	36.0	41.0	5.0	Drill Chip	Overburden	Clay	7.3	223	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)

Table B1: Acid Base Account Results for Overburden Materials

RGS Sample No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth					(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
76	EB1316687005	AMD199	MC5026 (VWP1)	41.0	66.0	25.0	Drill Chip	Overburden	Clay / Sand	8.0	156	0.01		0.3	1.4	-1.1	4.6	NAF (Barren)
77	EB1316687006	AMD200	MC5026 (VWP1)	66.0	80.0	14.0	Drill Chip	Overburden	Clay	8.0	801	0.06		1.8	7.7	-5.9	4.2	NAF (Barren)
78	EB1316687007	AMD201	MC5026 (VWP1)	80.0	94.0	14.0	Drill Chip	Overburden	Siltstone/Sandstone	8.1	821	0.06		1.8	12.4	-10.6	6.7	NAF (Barren)
79	EB1316687008	AMD202	MC5026 (VWP1)	94.0	130.0	36.0	Drill Chip	Overburden	Siltstone	8.8	475	0.03		0.9	12.6	-11.7	13.7	NAF (Barren)
80	EB1316687009	AMD203	MC5026 (VWP1)	130.0	162.0	32.0	Drill Chip	Overburden	Sandstone/Siltstone	9.0	446	0.04		1.2	15.1	-13.9	12.3	NAF (Barren)
81	EB1316687010	AMD204	MC5026 (VWP1)	162.0	179.0	17.0	Drill Chip	Overburden	Siltstone/Sandstone	9.1	417	0.05		1.5	52.4	-50.9	34.2	NAF (Barren)
82	EB1316687011	AMD205	MC5026 (VWP1)	179.0	202.0	23.0	Drill Chip	Overburden	Sandstone/Siltstone	9.0	404	0.04		1.2	53.6	-52.4	43.8	NAF (Barren)
83	EB1316687012	AMD206	MC5026 (VWP1)	202.0	221.0	19.0	Drill Chip	Overburden	Siltstone	9.0	493	0.04		1.2	80.6	-79.4	65.8	NAF (Barren)
84	EB1317305001	AMD224	MC5033 (E 8.5)	0.0	9.0	9.0	Drill Chip	Overburden	Soil	7.0	99	0.03		0.9	0.3	0.7	0.3	NAF (Barren)
85	EB1317305002	AMD225	MC5033 (E 8.5)	9.0	18.0	9.0	Drill Chip	Overburden	Sand/Claystone	6.5	120	0.04		1.2	0.3	1.0	0.2	NAF (Barren)
86	EB1317305003	AMD226	MC5033 (E 8.5)	18.0	35.0	17.0	Drill Chip	Overburden	Sand/Claystone	7.0	168	0.06		1.8	0.6	1.2	0.3	NAF (Barren)
87	EB1317305004	AMD227	MC5033 (E 8.5)	35.0	63.0	28.0	Drill Chip	Overburden	Claystone/Siltstone	8.9	357	0.03		0.9	13.0	-12.1	14.1	NAF (Barren)
88	EB1317305011	AMD234	MC5033 (E 8.5)	96.0	96.3	0.2	Drill Core	Overburden	Siltstone	8.7	126	0.06		1.8	14.7	-12.9	8.0	NAF (Barren)
89	EB1317305012	AMD235	MC5033 (E 8.5)	107.0	107.3	0.3	Drill Core	Overburden	Sandstone	7.8	99	0.06		1.8	22.8	-21.0	12.4	NAF (Barren)
90	EB1317305013	AMD236	MC5033 (E 8.5)	119.8	120.1	0.2	Drill Core	Overburden	Sandstone	8.8	135	0.03		0.9	11.8	-10.9	12.8	NAF (Barren)
91	EB1315494019	AMD177	MC5035 (CD 4.5)	0.0	5.0	5.0	Drill Chip	Overburden	Sand	7.5	40	0.005		0.2	1.8	-1.6	11.8	NAF (Barren)
92	EB1315494002	AMD178	MC5035 (CD 4.5)	6.0	21.0	15.0	Drill Chip	Overburden	Sand	7.5	22	0.01		0.3	1.6	-1.3	5.2	NAF (Barren)
93	EB1315494003	AMD179	MC5035 (CD 4.5)	22.0	37.0	15.0	Drill Chip	Overburden	Siltstone	7.3	86	0.04		1.2	2.0	-0.8	1.6	NAF (Barren)
94	EB1315494004	AMD180	MC5035 (CD 4.5)	48.5	49.0	0.5	Drill Core	Overburden	Sandstone/Siltstone	7.2	33	0.005		0.2	3.0	-2.8	19.6	NAF (Barren)
95	EB1315494005	AMD181	MC5035 (CD 4.5)	58.7	58.9	0.3	Drill Core	Overburden	Siltstone	6.6	119	0.05		1.5	4.3	-2.8	2.8	NAF (Barren)
96	EB1315494006	AMD182	MC5035 (CD 4.5)	67.8	68.3	0.5	Drill Core	Overburden	Claystone	7.8	107	0.06		1.8	9.0	-7.2	4.9	NAF (Barren)
97	EB1315494007	AMD183	MC5035 (CD 4.5)	74.3	74.6	0.3	Drill Core	Overburden	Carb Claystone	7.5	111	0.19	0.07	2.3	8.4	-6.1	3.7	NAF (Barren)
98	EB1319308012	AMD246	MC5036 (AB 3.5)	8.0	8.3	0.3	Drill Core	Overburden	Sandstone	7.2	14	0.005		0.2	1.2	-1.0	7.8	NAF (Barren)
99	EB1319308013	AMD247	MC5036 (AB 3.5)	21.3	21.6	0.3	Drill Core	Overburden	Sandstone	6.7	22	0.005		0.2	0.9	-0.7	5.9	NAF (Barren)
100	EB1319308014	AMD248	MC5036 (AB 3.5)	30.1	30.4	0.3	Drill Core	Overburden	Sandstone	7.0	17	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
101	EB1319308015	AMD249	MC5036 (AB 3.5)	40.8	41.1	0.3	Drill Core	Overburden	Sandstone	6.9	26	0.03		0.9	0.5	0.4	0.5	NAF (Barren)
102	EB1319308016	AMD250	MC5036 (AB 3.5)	52.6	52.9	0.3	Drill Core	Overburden	Siltstone	7.0	14	0.03		0.9	0.6	0.3	0.7	NAF (Barren)
103	EB1319308017	AMD251	MC5036 (AB 3.5)	61.6	61.9	0.3	Drill Core	Overburden	Claystone	7.3	26	0.005		0.2	0.9	-0.7	5.9	NAF (Barren)
104	EB1319308018	AMD252	MC5036 (AB 3.5)	70.0	70.3	0.3	Drill Core	Overburden	Claystone	7.7	34	0.01		0.3	1.8	-1.5	5.9	NAF (Barren)
105	EB1319308019	AMD253	MC5036 (AB 3.5)	81.6	81.9	0.3	Drill Core	Overburden	Claystone	8.0	33	0.005		0.2	1.4	-1.2	9.1	NAF (Barren)
106	EB1319308020	AMD254	MC5036 (AB 3.5)	89.2	89.5	0.3	Drill Core	Overburden	Sandstone	8.0	43	0.005		0.2	1.0	-0.8	6.5	NAF (Barren)
107	EB1319308021	AMD255	MC5036 (AB 3.5)	102.5	102.8	0.3	Drill Core	Overburden	Sandstone	8.6	72	0.01		0.3	12.5	-12.2	40.8	NAF (Barren)
108	EB1319308022	AMD256	MC5036 (AB 3.5)	110.4	110.7	0.3	Drill Core	Overburden	Sandstone	8.8	244	0.03		0.9	54.3	-53.4	59.1	NAF (Barren)
109	EB1319308023	AMD257	MC5036 (AB 3.5)	120.3	120.6	0.3	Drill Core	Overburden	Siltstone	8.9	149	0.005		0.2	25.2	-25.0	164.6	NAF (Barren)
110	EB1319308024	AMD258	MC5036 (AB 3.5)	130.1	130.4	0.3	Drill Core	Overburden	Claystone	8.9	129	0.01		0.3	27.5	-27.2	89.8	NAF (Barren)
111	EB1319308025	AMD259	MC5036 (AB 3.5)	143.0	143.3	0.3	Drill Core	Overburden	Claystone	9.0	95	0.005		0.2	17.4	-17.2	113.6	NAF (Barren)
112	EB1319308026	AMD260	MC5036 (AB 3.5)	151.5	151.8	0.3	Drill Core	Overburden	Siltstone	9.0	190	0.04		1.2	16.2	-15.0	13.2	NAF (Barren)
113	EB1319308027	AMD261	MC5036 (AB 3.5)	162.4	162.7	0.3	Drill Core	Overburden	Sandstone	8.8	235	0.04		1.2	32.4	-31.2	26.4	NAF (Barren)

Table B1: Acid Base Account Results for Overburden Materials

RGS Sample No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹ (µS/cm)	Total S (%)	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth												
114	EB1319308028	AMD262	MC5036 (AB 3.5)	169.7	170.0	0.3	Drill Core	Overburden	Siltstone	8.9	147	0.03		0.9	16.9	-16.0	18.4	NAF (Barren)
115	EB1319308029	AMD263	MC5036 (AB 3.5)	180.9	181.2	0.3	Drill Core	Overburden	Siltstone	9.0	188	0.01		0.3	18.9	-18.6	61.7	NAF (Barren)
116	EB1319308030	AMD264	MC5036 (AB 3.5)	191.7	192.0	0.3	Drill Core	Overburden	Siltstone	9.0	98	0.005		0.2	15.9	-15.7	103.8	NAF (Barren)
117	EB1319308031	AMD265	MC5036 (AB 3.5)	201.3	201.6	0.3	Drill Core	Overburden	Sandstone	8.8	150	0.04		1.2	13.6	-12.4	11.1	NAF (Barren)
118	EB1319308001	AMD237	MC5042 (F8)	0.0	10.0	10.0	Drill Chip	Overburden	Sand/Gravel	7.3	59	0.01		0.3	2.1	-1.8	6.9	NAF (Barren)
119	EB1319308002	AMD238	MC5042 (F8)	10.0	35.0	25.0	Drill Chip	Overburden	Sand/Silt	7.4	93	0.03		0.9	0.6	0.3	0.7	NAF (Barren)
120	EB1319308003	AMD239	MC5042 (F8)	35.0	51.0	16.0	Drill Chip	Overburden	Clay/Sand	7.1	71	0.03		0.9	0.3	0.7	0.3	NAF (Barren)
INTERBURDEN																		
121	EB1227477069	AMD069	MC5003	126.1	126.5	0.4	Drill Core	Interburden (B1/C3)	Sandstone	8.8	167	0.02		0.6	107.0	-106.4	174.7	NAF (Barren)
122	EB1227477070	AMD070	MC5003	128.5	128.8	0.3	Drill Core	Interburden (B1/C3)	Carb. Claystone	8.1	569	0.28	0.05	1.5	7.3	-5.8	4.8	NAF (Barren)
123	EB1227477071	AMD071	MC5003	132.8	133.2	0.4	Drill Core	Interburden (B1/C3)	Carb. Siltstone	8.3	568	0.05		1.5	4.4	-2.9	2.9	NAF (Barren)
124	EB1227477058	AMD058	MC5006	300.4	300.8	0.4	Drill Core	Interburden (C2/D2)	Siltstone	9.5	422	0.02		0.6	41.9	-41.3	68.4	NAF (Barren)
125	EB1227477015	AMD015	MC5009	188.2	188.5	0.3	Drill Core	Interburden (B1/C5)	Carb. Siltstone/Tuff	9.6	315	0.08		2.5	12.6	-10.2	5.1	NAF (Barren)
126	EB1227477016	AMD016	MC5009	188.6	189.0	0.4	Drill Core	Interburden (B1/C5)	Tuff	10.0	835	0.07		2.1	24.3	-22.2	11.3	NAF (Barren)
127	EB1227477020	AMD020	MC5009	199.7	199.9	0.3	Drill Core	Interburden (C5/C3)	Sandstone	9.8	669	0.02		0.6	98.3	-97.7	160.5	NAF (Barren)
128	EB1227477021	AMD021	MC5009	201.3	201.7	0.4	Drill Core	Interburden (C5/C3)	Dull Coal/Carb. Siltstone	9.6	258	0.02		0.6	7.3	-6.7	11.9	NAF (Barren)
129	EB1227477022	AMD022	MC5009	212.0	212.5	0.5	Drill Core	Interburden (C5/C3)	Sandstone	9.9	245	0.02		0.6	329.0	-328.4	537.1	NAF (Barren)
130	EB1227477023	AMD023	MC5009	221.5	222.0	0.5	Drill Core	Interburden (C5/C3)	Carb. Sandstone	9.8	712	0.03		0.9	41.2	-40.3	44.8	NAF (Barren)
131	EB1227477029	AMD029	MC5009	242.9	243.2	0.3	Drill Core	Interburden (DE)	Siltstone	10.8	916	0.005		0.2	15.5	-15.3	101.2	NAF (Barren)
132	EB1227477030	AMD030	MC5009	246.1	246.4	0.3	Drill Core	Interburden (DE)	Carb. Siltstone	11.0	1120	0.01		0.3	32.4	-32.1	105.8	NAF (Barren)
133	EB1231346017	AMD090	MC5014 (CD6)	162.0	174.0	12.0	Drill Chip	Interburden (AU2/AL6)	Sandstone	8.6	830	0.07		2.1	49.7	-47.6	23.2	NAF (Barren)
134	EB1231346018	AMD091	MC5014 (CD6)	175.0	188.0	13.0	Drill Chip	Interburden (AU2/AL6)	Sandstone	8.8	801	0.03		0.9	27.8	-26.9	30.3	NAF (Barren)
135	EB1231346019	AMD092	MC5014 (CD6)	197.0	197.2	0.2	Drill Core	Interburden (AU2/AL6)	Sandstone	9.8	281	0.01		0.3	63.0	-62.7	205.7	NAF (Barren)
136	EB1231346020	AMD093	MC5014 (CD6)	235.9	236.3	0.3	Drill Core	Interburden (B2/C4)	Sandstone	8.0	155	0.005		0.2	2.7	-2.5	17.6	NAF (Barren)
137	EB1231346021	AMD094	MC5014 (CD6)	250.2	250.4	0.2	Drill Core	Interburden (B2/C4)	Sandstone	9.3	149	0.005		0.2	292.0	-291.8	1906.9	NAF (Barren)
138	EB1231346023	AMD096	MC5014 (CD6)	262.6	262.9	0.3	Drill Core	Interburden (C3/C2)	Siltstone	10	135	0.005		0.2	6.0	-5.8	39.2	NAF (Barren)
139	EB1231346024	AMD097	MC5014 (CD6)	267.0	267.2	0.2	Drill Core	Interburden (C2/C1)	Siltstone	8.7	180	0.03		0.9	8.6	-7.7	9.4	NAF (Barren)
140	EB1313889008	AMD150	MC5020A (L16)	105.6	105.9	0.3	Drill Core	Interburden (C5/C2)	Sandstone	9.4	152	0.04		1.2	316.0	-314.8	258.0	NAF (Barren)
141	EB1313889009	AMD151	MC5020A (L16)	117.0	117.2	0.2	Drill Core	Interburden (C5/C2)	Sandstone	9.6	187	0.04		1.2	256.0	-254.8	209.0	NAF (Barren)
142	EB1313889010	AMD152	MC5020A (L16)	135.6	135.8	0.2	Drill Core	Interburden (C5/C2)	Sandstone	8.9	95	0.07		2.1	6.7	-4.6	3.1	NAF (Barren)
143	EB1313889011	AMD153	MC5020A (L16)	147.5	147.8	0.3	Drill Core	Interburden (C5/C2)	Conglomerate	7.2	112	0.05		1.5	5.9	-4.4	3.9	NAF (Barren)
144	EB1320398006	AMD293	MR1058 (MB21)	428.0	431.0	3.0	Drill Chip	D2/D1 Interburden	Carb Siltstone	9.6	255	0.20		6.1	15.2	-9.1	2.5	NAF
ROOF, PARTING AND FLOOR																		
145	EB1227477067	AMD067	MC5003	91.3	91.6	0.3	Drill Core	Roof (AL5)	Carb. Mudstone/Tuff	6.9	89	0.005		0.2	6.8	-6.6	44.4	NAF (Barren)
146	EB1227477068	AMD068	MC5003	113.0	113.3	0.2	Drill Core	Floor (B1)	Carb. Mudstone/Siltstone	6.8	213	0.22	0.12	3.8	6.2	-2.4	1.6	Uncertain
147	EB1227477072	AMD072	MC5003	133.5	133.6	0.2	Drill Core	Roof (C3)	Stoney Coal	8.0	183	0.28	0.04	1.2	6.7	-5.5	5.5	NAF (Barren)
148	EB1227477073	AMD073	MC5003	135.5	135.7	0.3	Drill Core	Floor (C3)	Carb. Siltstone	6.6	195	0.20	0.03	0.8	4.9	-4.1	6.4	NAF (Barren)

Table B1: Acid Base Account Results for Overburden Materials

RGS Sample No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth					(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
149	EB1227477047	AMD047	MC5006	240.4	240.8	0.4	Drill Core	Roof (AU4)	Siltstone	8.8	97	0.02		0.6	6.5	-5.9	10.6	NAF (Barren)
150	EB1227477048	AMD048	MC5006	242.2	242.5	0.3	Drill Core	Parting (AU4/AU3)	Carb. Claystone	9.1	304	0.01		0.3	10.1	-9.8	33.0	NAF (Barren)
151	EB1227477049	AMD049	MC5006	270.4	270.8	0.4	Drill Core	Floor (B1)	Dull Coal/Carb. Siltstone	10.0	428	0.03		0.9	9.7	-8.8	10.6	NAF (Barren)
152	EB1227477050	AMD050	MC5006	273.2	273.6	0.3	Drill Core	Roof (C5)	Stoney Coal	9.6	824	0.19	0.05	1.5	9.5	-8.0	6.5	NAF (Barren)
153	EB1227477051	AMD051	MC5006	274.4	274.7	0.2	Drill Core	Floor (C5)	Carb. Siltstone	8.2	598	0.23	0.16	4.8	12.5	-7.7	2.6	NAF
154	EB1227477052	AMD052	MC5006	278.1	278.4	0.4	Drill Core	Parting (C5/C4)	Coaly Conglomerate	9.2	284	0.02		0.6	25.9	-25.3	42.3	NAF (Barren)
155	EB1227477053	AMD053	MC5006	280.9	281.3	0.4	Drill Core	Parting (C5/C4)	Sandstone/Tuff	9.8	563	0.02		0.6	32.1	-31.5	52.4	NAF (Barren)
156	EB1227477054	AMD054	MC5006	282.4	282.6	0.3	Drill Core	Parting (C4/C3)	Tuff	10.0	697	0.005		0.2	25.2	-25.0	164.6	NAF (Barren)
157	EB1227477055	AMD055	MC5006	286.3	286.6	0.3	Drill Core	Floor (C3)	Dull Coal	8.2	202	0.19	0.02	0.5	7.9	-7.4	16.1	NAF (Barren)
158	EB1227477056	AMD056	MC5006	289.3	289.5	0.2	Drill Core	Roof (C2)	Carb. Siltstone	9.2	55	0.02		0.6	6.2	-5.6	10.1	NAF (Barren)
159	EB1227477057	AMD057	MC5006	290.4	290.7	0.2	Drill Core	Floor (C2)	Siltstone	9.0	91	0.02		0.6	0.7	-0.1	1.1	NAF (Barren)
160	EB1227477059	AMD059	MC5006	305.8	306.2	0.4	Drill Core	Roof (D2)	Carb. Mudstone	9.2	87	0.05		1.5	6.6	-5.1	4.3	NAF (Barren)
161	EB1227477060	AMD060	MC5006	309.3	309.7	0.3	Drill Core	Floor (D1)	Tuff	10.0	547	0.005		0.2	11.2	-11.0	73.1	NAF (Barren)
162	EB1227477012	AMD012	MC5009	160.8	161.1	0.3	Drill Core	Roof (AU3)	Carb. Claystone/Tuff	9.2	287	0.05		1.5	10.6	-9.1	6.9	NAF (Barren)
163	EB1227477013	AMD013	MC5009	178.4	178.8	0.4	Drill Core	Roof (B3)	Tuff	9.9	757	0.04		1.2	37.6	-36.4	30.7	NAF (Barren)
164	EB1227477014	AMD014	MC5009	187.2	187.5	0.3	Drill Core	Floor (B1)	Dull Coal	9.0	145	0.23	0.01	0.2	8.6	-8.4	46.8	NAF (Barren)
165	EB1227477017	AMD017	MC5009	189.2	189.6	0.3	Drill Core	Roof (C5)	Carb. Siltstone	8.9	349	0.09		2.8	9.7	-6.9	3.5	NAF (Barren)
166	EB1227477018	AMD018	MC5009	191.7	192.1	0.3	Drill Core	Floor (C5)	Carb. Claystone	8.2	116	0.23	0.04	1.1	4.3	-3.2	4.0	NAF (Barren)
167	EB1227477019	AMD019	MC5009	192.8	193.3	0.4	Drill Core	Parting (C5)	Carb. Siltstone	9.2	243	0.05		1.5	6.1	-4.6	4.0	NAF (Barren)
168	EB1227477024	AMD024	MC5009	229.2	229.6	0.5	Drill Core	Roof (C3)	Conglomerate	5.8	289	0.02		0.6	6.5	-5.9	10.6	NAF (Barren)
169	EB1227477025	AMD025	MC5009	231.6	232.0	0.4	Drill Core	Floor (C3)	Siltstone	9.7	215	0.02		0.6	5.7	-5.1	9.3	NAF (Barren)
170	EB1227477026	AMD026	MC5009	237.6	237.7	0.2	Drill Core	Roof (D2)	Tuff	10.6	905	0.04		1.2	22.8	-21.6	18.6	NAF (Barren)
171	EB1227477027	AMD027	MC5009	239.6	239.9	0.3	Drill Core	Floor (D2)	Carb. Siltstone	9.6	201	0.33	0.15	4.7	12.8	-8.1	2.7	NAF
172	EB1227477028	AMD028	MC5009	241.6	241.8	0.2	Drill Core	Roof (D1)	Tuff	10.8	1160	0.005		0.2	23.7	-23.5	154.8	NAF (Barren)
173	EB1231346015	AMD088	MC5014 (CD6)	154.1	154.4	0.3	Drill Core	Roof (AU2)	Dull Coal/Carb. Clay	7.5	235	0.25	0.02	0.5	9.3	-8.8	20.2	NAF (Barren)
174	EB1231346016	AMD089	MC5014 (CD6)	157.1	157.3	0.2	Drill Core	Floor (AU1)	Dull Coal/Carb. Clay	7.7	445	0.32		9.8	34.3	-24.5	3.5	NAF
175	EB1231346022	AMD095	MC5014 (CD6)	256.3	256.5	0.2	Drill Core	Roof (C4)	Dull Coal/Tuff	9.2	301	0.25	0.03	0.9	8.2	-7.3	9.2	NAF (Barren)
176	EB1313278007	AMD120	MC5016 (BC2.5)	81.2	81.4	0.2	Drill Core	Floor (AU4)	Carb Claystone/Tuff	7.9	180	0.10		3.1	7.2	-4.1	2.4	NAF (Barren)
177	EB1313278008	AMD121	MC5016 (BC2.5)	79.5	79.7	0.2	Drill Core	Roof (AU4)	Siltstone	7.9	32	0.03		0.9	3.3	-2.4	3.6	NAF (Barren)
178	EB1313278009	AMD122	MC5016 (BC2.5)	84.2	84.5	0.2	Drill Core	Roof (AU3)	Tuff/Siltstone	8.9	285	0.07		2.1	20.8	-18.7	9.7	NAF (Barren)
179	EB1313278010	AMD123	MC5016 (BC2.5)	92.4	92.7	0.3	Drill Core	Floor (AL1)	Carb Claystone	8.7	225	0.09		2.8	9.9	-7.1	3.6	NAF (Barren)
180	EB1313278011	AMD124	MC5016 (BC2.5)	95.0	95.2	0.2	Drill Core	Roof (AL5)	Siltstone/Tuff	9.3	162	0.05		1.5	84.9	-83.4	55.4	NAF (Barren)
181	EB1313278012	AMD125	MC5016 (BC2.5)	97.4	97.6	0.2	Drill Core	Floor (AL5)	Tuff	8.8	309	0.06		1.8	22.0	-20.2	12.0	NAF (Barren)
182	EB1313278013	AMD126	MC5016 (BC2.5)	109.2	109.4	0.2	Drill Core	Floor (AL1L)	Tuff	8.9	166	0.06		1.8	60.9	-59.1	33.1	NAF (Barren)
183	EB1313278014	AMD127	MC5016 (BC2.5)	112.1	112.3	0.2	Drill Core	Roof (B2)	Siltstone	7.7	131	0.11	0.01	0.2	5.7	-5.5	31.0	NAF (Barren)
184	EB1313278015	AMD128	MC5016 (BC2.5)	115.4	115.6	0.2	Drill Core	Floor (B2L)	Carb Claystone/Siltstone	7.1	97	0.11	0.03	0.9	5.5	-4.6	6.2	NAF (Barren)
185	EB1313278016	AMD129	MC5016 (BC2.5)	122.8	123.0	0.2	Drill Core	Roof (C5)	Claystone	7.1	168	0.15	0.02	0.6	5.5	-4.9	10.0	NAF (Barren)

Table B1: Acid Base Account Results for Overburden Materials

RGS Sample No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth					(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
186	EB1313278017	AMD130	MC5016 (BC2.5)	124.3	124.6	0.3	Drill Core	Floor (C5)	Claystone/Tuff	8.1	365	0.08		2.5	11.4	-9.0	4.7	NAF (Barren)
187	EB1313278018	AMD131	MC5016 (BC2.5)	131.5	131.7	0.2	Drill Core	Roof (C4)	Carb Claystone/Tuff	6.9	158	0.27	0.01	0.4	5.9	-5.5	13.8	NAF (Barren)
188	EB1313278019	AMD132	MC5016 (BC2.5)	135.4	135.7	0.3	Drill Core	Floor (C3)	Fine Sandstone	7.4	74	0.07		2.1	3.9	-1.8	1.8	NAF (Barren)
189	EB1313278020	AMD133	MC5016 (BC2.5)	137.7	137.9	0.3	Drill Core	Roof (C2)	Siltstone	7.4	82	0.06		1.8	5.9	-4.1	3.2	NAF (Barren)
190	EB1313278021	AMD134	MC5016 (BC2.5)	139.3	139.4	0.1	Drill Core	Floor (C2)	Siltstone	7.9	80	0.05		1.5	5.3	-3.8	3.5	NAF (Barren)
191	EB1313278022	AMD135	MC5016 (BC2.5)	148.3	148.5	0.2	Drill Core	Roof (C1)	Siltstone	8.2	187	0.03		0.9	37.6	-36.7	40.9	NAF (Barren)
192	EB1313278023	AMD136	MC5016 (BC2.5)	149.2	149.4	0.2	Drill Core	Floor (C1)	Siltstone	8.4	235	0.04		1.2	46.8	-45.6	38.2	NAF (Barren)
193	EB1313278024	AMD137	MC5016 (BC2.5)	151.2	151.3	0.1	Drill Core	Roof (D3)	Claystone	9.0	272	0.05		1.5	24.1	-22.6	15.7	NAF (Barren)
194	EB1313278025	AMD138	MC5016 (BC2.5)	152.2	152.5	0.3	Drill Core	Floor (D3)	Siltstone	7.5	82	0.10		3.1	10.0	-6.9	3.3	NAF (Barren)
195	EB1313278026	AMD139	MC5016 (BC2.5)	154.2	154.4	0.2	Drill Core	Roof (D2)	Claystone	7.4	133	0.15	0.03	0.8	6.8	-6.0	8.5	NAF (Barren)
196	EB1313278027	AMD140	MC5016 (BC2.5)	156.5	156.6	0.2	Drill Core	Floor (D1)	Claystone	8.6	268	0.04		1.2	9.9	-8.7	8.1	NAF (Barren)
197	EB1312454008	AMD110	MC5019 (H10)	93.2	93.5	0.3	Drill Core	Roof (D2)	Carb Claystone	7.4	450	0.27	0.06	1.9	2.4	-0.5	1.3	NAF (Barren)
198	EB1312454009	AMD111	MC5019 (H10)	95.8	96.0	0.1	Drill Core	Floor (D1)	Siltstone	8.9	148	0.05		1.5	6.7	-5.2	4.4	NAF (Barren)
199	EB1313889005	AMD147	MC5020A (L16)	88.4	88.6	0.2	Drill Core	Floor (B1)	Tuff/Carb Mud	8.1	209	0.10		3.1	4.5	-1.4	1.5	NAF (Barren)
200	EB1313889006	AMD148	MC5020A (L16)	91.9	92.1	0.2	Drill Core	Roof (C5)	Tuff/Carb Mud	8.7	334	0.05		1.5	8.9	-7.4	5.8	NAF (Barren)
201	EB1313889007	AMD149	MC5020A (L16)	94.1	94.3	0.2	Drill Core	Floor (C5)	Tuff	8.5	110	0.05		1.5	3.9	-2.4	2.5	NAF (Barren)
202	EB1313889012	AMD154	MC5020A (L16)	155.0	155.1	0.1	Drill Core	Floor (D2)	Carbonaceous Claystone	9.3	66	0.27	0.17	5.3	7.9	-2.6	1.5	Uncertain
203	EB1313889013	AMD155	MC5020A (L16)	152.0	152.2	0.3	Drill Core	Floor (C1)	Carbonaceous Claystone	9.1	147	0.04		1.2	5.2	-4.0	4.2	NAF (Barren)
204	EB1313889014	AMD156	MC5020A (L16)	156.7	156.8	0.2	Drill Core	Roof (D1)	Carbonaceous Claystone	9.5	359	0.05		1.5	10.1	-8.6	6.6	NAF (Barren)
205	EB1313889015	AMD157	MC5020A (L16)	158.1	158.3	0.2	Drill Core	Floor (D1)	Tuff	9.7	255	0.25	0.01	0.2	14.6	-14.4	95.3	NAF (Barren)
206	EB1316687024	AMD218	MC5024 (VWP2)	199.7	200.0	0.3	Drill Core	Roof (AU2)	Siltstone	7.7	135	0.06		1.8	1.6	0.2	0.9	NAF (Barren)
207	EB1316687025	AMD219	MC5024 (VWP2)	217.1	217.4	0.3	Drill Core	Floor (AL1)	Tuff	8.8	473	0.03		0.9	61.2	-60.3	66.6	NAF (Barren)
208	EB1316687026	AMD220	MC5024 (VWP2)	272.3	272.6	0.3	Drill Core	Roof (D2)	Sandstone	8.1	79	0.03		0.9	1.5	-0.6	1.6	NAF (Barren)
209	EB1316687027	AMD221	MC5024 (VWP2)	276.0	276.3	0.3	Drill Core	Floor (D2)	Carbonaceous Siltstone	8.4	325	0.29	0.16	4.7	7.2	-2.5	1.5	Uncertain
210	EB1316687028	AMD222	MC5024 (VWP2)	278.0	278.3	0.3	Drill Core	Roof (D1)	Carbonaceous Siltstone	8.4	362	0.21	0.07	2.0	10.8	-8.8	5.4	NAF (Barren)
211	EB1316687029	AMD223	MC5024 (VWP2)	280.2	280.5	0.3	Drill Core	Floor (D1)	Carbonaceous Siltstone	8.6	170	0.10		3.1	4.4	-1.3	1.4	NAF (Barren)
212	EB1313885006	AMD164	MC5025A (MB6)	107.1	107.3	0.2	Drill Core	Roof (AU4)	Carb Claystone	8.1	147	0.06		1.8	4.8	-3.0	2.6	NAF (Barren)
213	EB1313885007	AMD165	MC5025A (MB6)	108.1	108.4	0.3	Drill Core	Floor (AU4)	Siltstone/Tuff	8.3	256	0.05		1.5	5.9	-4.4	3.9	NAF (Barren)
214	EB1313885008	AMD166	MC5025A (MB6)	108.9	109.1	0.3	Drill Core	Roof (AU3)	Carb Claystone	7.9	156	0.08		2.5	4.9	-2.5	2.0	NAF (Barren)
215	EB1313885009	AMD167	MC5025A (MB6)	136.3	136.6	0.3	Drill Core	Floor (B1)	Carb Claystone/Tuff	8.3	480	0.08		2.5	10.0	-7.6	4.1	NAF (Barren)
216	EB1313885010	AMD168	MC5025A (MB6)	138.1	138.3	0.2	Drill Core	Roof (C5B)	Claystone/Tuff	8.4	460	0.24		7.4	16.5	-9.2	2.2	NAF
217	EB1313885011	AMD169	MC5025A (MB6)	140.2	140.4	0.3	Drill Core	Floor (C5A)	Siltstone	8.3	228	0.05		1.5	5.3	-3.8	3.5	NAF (Barren)
218	EB1313885014	AMD172	MC5025A (MB6)	145.4	145.7	0.3	Drill Core	Floor (B1)	Sandstone	8.4	401	0.14		4.3	10.3	-6.0	2.4	NAF
219	EB1313885012	AMD170	MC5025A (MB6)	183.7	184.0	0.2	Drill Core	Roof (D2)	Claystone/Tuff	8.7	254	0.07		2.1	9.6	-7.5	4.5	NAF (Barren)
220	EB1313885013	AMD171	MC5025A (MB6)	187.4	187.6	0.2	Drill Core	Floor (D1)	Siltstone	9.1	239	0.04		1.2	11.0	-9.8	9.0	NAF (Barren)
221	EB1316687013	AMD207	MC5026 (VWP1)	243.5	243.8	0.3	Drill Core	Roof (AU3)	Coal/Carb Claystone	8.7	227	0.05		1.5	8.6	-7.1	5.6	NAF (Barren)
222	EB1316687014	AMD208	MC5026 (VWP1)	260.9	261.1	0.2	Drill Core	Floor (AL1)/Roof (B3)	Tuff	9.1	415	0.04		1.2	62.8	-61.6	51.3	NAF (Barren)

Table B1: Acid Base Account Results for Overburden Materials

RGS Sample No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth					(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
223	EB1316687015	AMD209	MC5026 (VWP1)	268.7	269.0	0.3	Drill Core	Floor (B1)	Tuff/Coal/Carb Claystone	8.4	228	0.14	0.01	0.2	6.9	-6.7	37.6	NAF (Barren)
224	EB1316687016	AMD210	MC5026 (VWP1)	310.7	311.0	0.3	Drill Core	Roof (D2)	Carbonaceous Siltstone	9.3	376	0.05		1.5	12.7	-11.2	8.3	NAF (Barren)
225	EB1316687017	AMD211	MC5026 (VWP1)	314.3	314.6	0.3	Drill Core	Floor (D2)	Siltstone/Tuff	9.4	347	0.03		0.9	9.0	-8.1	9.8	NAF (Barren)
226	EB1316687018	AMD212	MC5026 (VWP1)	321.7	322.0	0.3	Drill Core	Floor (D1)	Siltstone	8.4	66	0.06		1.8	3.4	-1.6	1.9	NAF (Barren)
227	EB1316687019	AMD213	MC5027 (VWP3)	259.9	260.2	0.3	Drill Core	Roof (AU3)	Carb Claystone	7.5	84	0.16	0.01	0.2	3.3	-3.1	18.0	NAF (Barren)
228	EB1316687020	AMD214	MC5027 (VWP3)	260.8	261.1	0.3	Drill Core	Floor (AU3)	Sandstone	8.1	117	0.05		1.5	63.6	-62.1	41.5	NAF (Barren)
229	EB1316687021	AMD215	MC5027 (VWP3)	262.0	262.3	0.3	Drill Core	Roof (AU2)	Siltstone	8.0	215	0.06		1.8	16.0	-14.2	8.7	NAF (Barren)
230	EB1316687022	AMD216	MC5027 (VWP3)	312.4	312.7	0.3	Drill Core	Roof (D2)	Siltstone	8.2	69	0.05		1.5	4.0	-2.5	2.6	NAF (Barren)
231	EB1316687023	AMD217	MC5027 (VWP3)	318.6	318.9	0.3	Drill Core	Floor (D1)	Sandstone	9.2	173	0.03		0.9	61.2	-60.3	66.6	NAF (Barren)
232	EB1313885015	AMD173	MC5030	281.4	281.7	0.3	Drill Core	Roof (AU4)	Carb Claystone/Coal	7.4	93	0.14		4.3	3.0	1.3	0.7	Uncertain
233	EB1313885016	AMD174	MC5030	299.8	300.1	0.3	Drill Core	Floor (AL1)	Tuff	8.6	291	0.04		1.2	18.5	-17.3	15.1	NAF (Barren)
234	EB1313885017	AMD175	MC5030	336.6	336.9	0.3	Drill Core	Roof (D2)	Siltstone	8.2	189	0.07		2.1	21.3	-19.2	9.9	NAF (Barren)
235	EB1313885018	AMD176	MC5030	342.3	342.5	0.2	Drill Core	Floor (D1)	Sandstone	8.6	57	0.04		1.2	2.6	-1.4	2.1	NAF (Barren)
236	EB1317305005	AMD228	MC5033 (E 8.5)	129.3	129.6	0.3	Drill Core	Roof (AU2)	Carbonaceous Siltstone	6.6	115	0.23	0.03	0.9	2.1	-1.2	2.3	NAF (Barren)
237	EB1317305006	AMD229	MC5033 (E 8.5)	133.4	133.8	0.3	Drill Core	Floor (AU1)	Carbonaceous Siltstone/Tuff	6.6	231	0.50	0.21	6.3	3.4	2.9	0.5	Uncertain
238	EB1317305007	AMD230	MC5033 (E 8.5)	137.5	137.8	0.3	Drill Core	Roof (AL5)	Siltstone/Tuff	8.7	282	0.07		2.1	25.2	-23.1	11.8	NAF (Barren)
239	EB1317305008	AMD231	MC5033 (E 8.5)	139.6	139.9	0.3	Drill Core	Floor (AL5)	Carbonaceous Siltstone/Tuff	8.5	310	0.10		3.1	68.6	-65.5	22.4	NAF (Barren)
240	EB1317305009	AMD232	MC5033 (E 8.5)	150.2	150.7	0.5	Drill Core	Floor (AL1)/Roof (B3)	Siltstone/Tuff	8.9	234	0.05		1.5	54.9	-53.4	35.9	NAF (Barren)
241	EB1317305010	AMD233	MC5033 (E 8.5)	158.6	158.9	0.3	Drill Core	Floor (B1)	Siltstone/Sandstone	8.0	209	0.05		1.5	6.8	-5.3	4.4	NAF (Barren)
242	EB1315494008	AMD184	MC5035 (CD 4.5)	85.3	85.6	0.3	Drill Core	Floor (AU1)/Roof (AL5)	Tuff/Carb Claystone	8.8	226	0.10		3.1	10.4	-7.3	3.4	NAF (Barren)
243	EB1315494009	AMD185	MC5035 (CD 4.5)	98.2	98.6	0.3	Drill Core	Floor (AL1)/Roof (B3)	Tuff/Carb Claystone	9.3	291	0.08		2.5	18.5	-16.1	7.6	NAF (Barren)
244	EB1315494010	AMD186	MC5035 (CD 4.5)	104.9	105.3	0.4	Drill Core	Floor (B2)	Carb Claystone/Sandstone	5.2	239	0.59	0.39	12.0	19.7	-7.7	1.6	NAF
245	EB1315494011	AMD187	MC5035 (CD 4.5)	132.7	133.1	0.4	Drill Core	Roof (C4)	Tuff/Carb Claystone	8.1	253	0.28	0.02	0.5	8.4	-7.9	16.1	NAF (Barren)
246	EB1315494012	AMD188	MC5035 (CD 4.5)	138.0	138.3	0.3	Drill Core	Floor (C3)	Sandstone/Siltstone	7.7	72	0.07		2.1	3.5	-1.4	1.6	NAF (Barren)
247	EB1315494013	AMD189	MC5035 (CD 4.5)	143.1	143.4	0.2	Drill Core	Roof (C2)	Siltstone/Carb Claystone	7.5	84	0.05		1.5	7.2	-5.7	4.7	NAF (Barren)
248	EB1315494014	AMD190	MC5035 (CD 4.5)	145.0	145.4	0.3	Drill Core	Floor (C2)	Siltstone	7.5	125	0.07		2.1	5.5	-3.4	2.6	NAF (Barren)
249	EB1315494015	AMD191	MC5035 (CD 4.5)	147.7	148.0	0.3	Drill Core	Roof (C1)	Siltstone	8.2	67	0.04		1.2	8.2	-7.0	6.7	NAF (Barren)
250	EB1315494016	AMD192	MC5035 (CD 4.5)	148.4	148.7	0.3	Drill Core	Floor (C1)	Siltstone	8.3	60	0.05		1.5	6.6	-5.1	4.3	NAF (Barren)
251	EB1315494017	AMD193	MC5035 (CD 4.5)	155.0	155.3	0.3	Drill Core	Roof (D2)	Carb Claystone	7.5	207	0.26	0.12	3.7	9.3	-5.6	2.5	NAF
252	EB1315494018	AMD194	MC5035 (CD 4.5)	157.5	157.7	0.3	Drill Core	Floor (D1)	Carb Claystone	9.5	189	0.05		1.5	10.0	-8.5	6.5	NAF (Barren)
253	EB1319308032	AMD266	MC5036 (AB 3.5)	205.3	205.6	0.3	Drill Core	Roof (AU2)	Claystone/Carb. Siltstone	7.6	272	0.07		2.1	8.4	-6.3	3.9	NAF (Barren)
254	EB1319308033	AMD267	MC5036 (AB 3.5)	207.0	207.3	0.3	Drill Core	Floor (AU2)	Sandstone/Siltstone	8.5	157	0.05		1.5	9.1	-7.6	5.9	NAF (Barren)
255	EB1319308034	AMD268	MC5036 (AB 3.5)	209.2	209.5	0.3	Drill Core	Roof (AU1)	Sandstone	9.0	293	0.08		2.5	16.2	-13.8	6.6	NAF (Barren)
256	EB1319308035	AMD269	MC5036 (AB 3.5)	211.8	212.1	0.3	Drill Core	Floor (AU1)	Sandstone/Siltstone	9.1	299	0.04		1.2	9.3	-8.1	7.6	NAF (Barren)
257	EB1319308036	AMD270	MC5036 (AB 3.5)	245.3	245.6	0.3	Drill Core	Floor AU1/Roof (AL5)	Sandstone	9.7	243	0.03		0.9	24.5	-23.6	26.7	NAF (Barren)
258	EB1319308037	AMD271	MC5036 (AB 3.5)	272.5	272.8	0.3	Drill Core	Roof (AL5)	Tuff/Coal	8.4	441	0.07		2.1	31.9	-29.8	14.9	NAF (Barren)
259	EB1319308038	AMD272	MC5036 (AB 3.5)	291.5	291.8	0.3	Drill Core	Floor (B2)	Tuff/Coal	8.2	327	0.10		3.1	15.1	-12.0	4.9	NAF (Barren)

Table B1: Acid Base Account Results for Overburden Materials

RGS Sample No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹ (µS/cm)	Total S (%)	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth												
260	EB1319308039	AMD273	MC5036 (AB 3.5)	313.7	314.0	0.3	Drill Core	Roof (C4)	Coal/Siltstone/Tuff	7.6	263	0.19		5.8	11.7	-5.9	2.0	NAF
261	EB1319308040	AMD274	MC5036 (AB 3.5)	318.7	319.0	0.3	Drill Core	Floor (C3)	Sandstone	8.4	69	0.04		1.2	3.4	-2.2	2.8	NAF (Barren)
262	EB1319308041	AMD275	MC5036 (AB 3.5)	324.5	324.8	0.3	Drill Core	Roof (C2)	Siltstone	8.3	156	0.04		1.2	12.0	-10.8	9.8	NAF (Barren)
263	EB1319308042	AMD276	MC5036 (AB 3.5)	327.2	327.5	0.3	Drill Core	Floor (C2)	Siltstone/Coal	7.9	117	0.07		2.1	4.7	-2.6	2.2	NAF (Barren)
264	EB1319308043	AMD277	MC5036 (AB 3.5)	327.9	328.2	0.3	Drill Core	Roof (C1)	Siltstone/Coal	7.8	149	0.08		2.5	11.6	-9.2	4.7	NAF (Barren)
265	EB1319308044	AMD278	MC5036 (AB 3.5)	330.8	331.1	0.3	Drill Core	Floor (D3)	Tuff	8.5	160	0.04		1.2	246.0	-244.8	200.8	NAF (Barren)
266	EB1319308045	AMD279	MC5036 (AB 3.5)	333.8	334.1	0.3	Drill Core	Roof (D1)	Claystone	8.1	257	0.16		4.9	12.4	-7.5	2.5	NAF
267	EB1319308046	AMD280	MC5036 (AB 3.5)	336.5	336.8	0.3	Drill Core	Floor (D1)	Sandstone	9.0	246	0.03		0.9	21.8	-20.9	23.7	NAF (Barren)
268	EB1319308004	AMD240	MC5042 (F8)	77.3	77.6	0.2	Drill Core	Roof (B2)	Claystone	6.5	118	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
269	EB1319308005	AMD281	MC5042 (F8)	82.0	82.3	0.3	Drill Core	Floor (B1)	Sandstone	7.0	76	0.04		1.2	0.5	0.7	0.4	NAF (Barren)
270	EB1319308006	AMD282	MC5042 (F8)	93.0	93.3	0.3	Drill Core	Roof (C3)	Sandstone	6.0	145	0.05		1.5	2.6	-1.1	1.7	NAF (Barren)
271	EB1319308007	AMD241	MC5042 (F8)	96.5	96.8	0.3	Drill Core	Roof (C2)	Sandstone/Coal	6.1	100	0.10		3.1	2.9	0.2	0.9	NAF (Barren)
272	EB1319308008	AMD242	MC5042 (F8)	98.0	98.2	0.3	Drill Core	Floor (C2)	Claystone	6.9	83	0.06		1.8	2.1	-0.3	1.1	NAF (Barren)
273	EB1319308009	AMD243	MC5042 (F8)	105.0	105.3	0.2	Drill Core	Roof (C1)	Claystone	7.5	69	0.04		1.2	2.5	-1.3	2.0	NAF (Barren)
274	EB1319308010	AMD244	MC5042 (F8)	106.0	106.3	0.3	Drill Core	Floor (C1)	Siltstone/Sandstone	7.5	69	0.04		1.2	3.6	-2.4	2.9	NAF (Barren)
275	EB1319308011	AMD245	MC5042 (F8)	109.3	109.5	0.2	Drill Core	Floor C1	Siltstone	8.1	112	0.04		1.2	4.6	-3.4	3.8	NAF (Barren)
276	EB1320398009	AMD284	MC5048 (VWP5)	463.5	463.8	0.3	Drill Core	Roof (A)	Claystone	9.4	112	0.09		2.8	17.7	-14.9	6.4	NAF (Barren)
277	EB1320398010	AMD286	MC5048 (VWP5)	512.7	513.0	0.3	Drill Core	Roof (D)	Sandstone	8.3	90	0.04		1.2	2.8	-1.6	2.3	NAF (Barren)
278	EB1320398011	AMD287	MC5048 (VWP5)	520.2	520.5	0.3	Drill Core	Floor (D)	Claystone	8.9	95	0.03		0.9	62.4	-61.5	67.9	NAF (Barren)
279	EB1320398001	AMD288	MR1058 (MB21)	355.0	360.0	5.0	Drill Chip	Roof (AL)	Coal/Claystone	9.1	205	0.16		4.9	36.6	-31.7	7.5	NAF
280	EB1320398002	AMD289	MR1058 (MB21)	360.0	365.0	5.0	Drill Chip	Coal (AL)	Coal	9.0	191	0.16		4.9	40.2	-35.3	8.2	NAF
281	EB1320398003	AMD290	MR1058 (MB21)	365.0	370.0	5.0	Drill Chip	Floor (AL)	Coal/Claystone	9.1	187	0.21		6.4	34.3	-27.9	5.3	NAF
282	EB1320398004	AMD291	MR1058 (MB21)	420.0	425.0	5.0	Drill Chip	Roof (D2)	Sandstone	9.7	202	0.06		1.8	14.1	-12.3	7.7	NAF (Barren)
283	EB1320398005	AMD292	MR1058 (MB21)	425.0	428.0	3.0	Drill Chip	Coal (D2)	Coal	9.6	198	0.13		4.0	17.4	-13.4	4.4	NAF
284	EB1320398007	AMD294	MR1058 (MB21)	431.0	432.0	1.0	Drill Chip	Coal (D1)	Coal	9.8	261	0.16		4.9	23.2	-18.3	4.7	NAF
285	EB1320398008	AMD295	MR1058 (MB21)	432.0	435.0	3.0	Drill Chip	Floor (D1)	Carb Claystone/Coal	9.8	231	0.18		5.5	24.2	-18.7	4.4	NAF

Notes

- Current pH, EC, Alkalinity and Acidity provided for 1:5 sample:water extracts
- Scr = Chromium Reducible Sulfur; MPA = Maximum Potential Acidity; ANC = Acid Neutralising Capacity; and NAPP = Net Acid Producing Potential.
- Sample classification criteria provided in report text. NAF = Non-Acid Forming. PAF = Potentially Acid Forming.

Table B2: Overburden Samples Selected for Additional Geochemical (Multi-Element) Tests

RGS ME No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Source	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth					(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
OVERBURDEN																		
1	EB1227477062	AMD062	MC5003	16.0	25.0	9.0	Drill Chip	Overburden	Sandstone	7.1	246	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
	EB1227477063	AMD063	MC5003	26.0	40.0	14.0	Drill Chip	Overburden	Sandstone	7.6	250	0.005		0.2	1.4	-1.2	9.1	NAF (Barren)
	EB1227477064	AMD064	MC5003	41.0	55.0	14.0	Drill Chip	Overburden	Sandstone	7.3	270	0.005		0.2	1.2	-1.0	7.8	NAF (Barren)
2	EB1227477066	AMD066	MC5003	90.1	90.5	0.4	Drill Core	Overburden	Claystone	7.0	140	0.005		0.2	7.1	-6.9	46.4	NAF (Barren)
3	EB1227477067	AMD067	MC5003	91.3	91.6	0.3	Drill Core	Roof (AL5)	Carb. Mudstone/Tuff	6.9	89	0.005		0.2	6.8	-6.6	44.4	NAF (Barren)
	EB1227477068	AMD068	MC5003	113.0	113.3	0.2	Drill Core	Floor (B1)	Carb. Mudstone/Siltstone	6.8	213	0.22	0.124	3.8	6.2	-2.4	1.6	Uncertain
4	EB1227477069	AMD069	MC5003	126.1	126.5	0.4	Drill Core	Interburden (B1/C3)	Sandstone	8.8	167	0.02		0.6	107.0	-106.4	174.7	NAF (Barren)
	EB1227477070	AMD070	MC5003	128.5	128.8	0.3	Drill Core	Interburden (B1/C3)	Carb. Claystone	8.1	569	0.28	0.05	1.5	7.3	-5.8	4.8	NAF (Barren)
	EB1227477071	AMD071	MC5003	132.8	133.2	0.4	Drill Core	Interburden (B1/C3)	Carb. Siltstone	8.3	568	0.05		1.5	4.4	-2.9	2.9	NAF (Barren)
5	EB1227477040	AMD040	MC5006	170.0	180.0	10.0	Drill Chip	Overburden	Siltstone	9.0	317	0.005		0.2	11.8	-11.6	77.1	NAF (Barren)
	EB1227477041	AMD041	MC5006	190.0	205.0	15.0	Drill Chip	Overburden	Siltstone	8.8	415	0.02		0.6	32.6	-32.0	53.2	NAF (Barren)
6	EB1227477044	AMD044	MC5006	227.2	227.5	0.4	Drill Core	Overburden	Sandstone	9.5	133	0.005		0.2	274.0	-273.8	1789.4	NAF (Barren)
	EB1227477045	AMD045	MC5006	233.9	234.2	0.3	Drill Core	Overburden	Siltstone	9.0	104	0.02		0.6	7.0	-6.4	11.4	NAF (Barren)
	EB1227477046	AMD046	MC5006	238.6	238.9	0.3	Drill Core	Overburden	Sandstone	9.0	192	0.01		0.3	7.1	-6.8	23.2	NAF (Barren)
	EB1227477047	AMD047	MC5006	240.4	240.8	0.4	Drill Core	Overburden	Siltstone	8.8	97	0.02		0.6	6.5	-5.9	10.6	NAF (Barren)
7	EB1227477049	AMD049	MC5006	270.4	270.8	0.4	Drill Core	Floor (B1)	Dull Coal/Carb. Siltstone	10.0	428	0.03		0.9	9.7	-8.8	10.6	NAF (Barren)
	EB1227477050	AMD050	MC5006	273.2	273.6	0.3	Drill Core	Roof (C5)	Stoney Coal	9.6	824	0.19	0.048	1.5	9.5	-8.0	6.5	NAF (Barren)
	EB1227477051	AMD051	MC5006	274.4	274.7	0.2	Drill Core	Floor (C5)	Carb. Siltstone	8.2	598	0.23	0.158	4.8	12.5	-7.7	2.6	Non-Acid Forming
8	EB1227477058	AMD058	MC5006	300.4	300.8	0.4	Drill Core	Interburden (C2/D2)	Siltstone	9.5	422	0.02		0.6	41.9	-41.3	68.4	NAF (Barren)
9	EB1227477002	AMD002	MC5009	10.0	20.0	10.0	Drill Chip	Overburden	Clay	7.4	293	0.005		0.2	6.1	-5.9	39.8	NAF (Barren)
	EB1227477003	AMD003	MC5009	20.0	29.0	9.0	Drill Chip	Overburden	Clay	8.0	334	0.005		0.2	8.2	-8.0	53.6	NAF (Barren)
10	EB1227477012	AMD012	MC5009	160.8	161.1	0.3	Drill Core	Roof (AU3)	Carb. Claystone/Tuff	9.2	287	0.05		1.5	10.6	-9.1	6.9	NAF (Barren)
	EB1227477013	AMD013	MC5009	178.4	178.8	0.4	Drill Core	Roof (B3)	Tuff	9.9	757	0.04		1.2	37.6	-36.4	30.7	NAF (Barren)
	EB1227477014	AMD014	MC5009	187.2	187.5	0.3	Drill Core	Floor (B1)	Dull Coal	9.0	145	0.23	0.006	0.2	8.6	-8.4	46.8	NAF (Barren)
11	EB1227477017	AMD017	MC5009	189.2	189.6	0.3	Drill Core	Roof (C5)	Carb. Siltstone	8.9	349	0.09		2.8	9.7	-6.9	3.5	NAF (Barren)
	EB1227477018	AMD018	MC5009	191.7	192.1	0.3	Drill Core	Floor (C5)	Carb. Claystone	8.2	116	0.23	0.035	1.1	4.3	-3.2	4.0	NAF (Barren)
	EB1227477019	AMD019	MC5009	192.8	193.3	0.4	Drill Core	Parting (C5)	Carb. Siltstone	9.2	243	0.05		1.5	6.1	-4.6	4.0	NAF (Barren)
12	EB1227477020	AMD020	MC5009	199.7	199.9	0.3	Drill Core	Interburden (C5/C3)	Sandstone	9.8	669	0.02		0.6	98.3	-97.7	160.5	NAF (Barren)
	EB1227477021	AMD021	MC5009	201.3	201.7	0.4	Drill Core	Interburden (C5/C3)	Dull Coal/Carb. Siltstone	9.6	258	0.02		0.6	7.3	-6.7	11.9	NAF (Barren)
	EB1227477022	AMD022	MC5009	212.0	212.5	0.5	Drill Core	Interburden (C5/C3)	Sandstone	9.9	245	0.02		0.6	329.0	-328.4	537.1	NAF (Barren)
	EB1227477023	AMD023	MC5009	221.5	222.0	0.5	Drill Core	Interburden (C5/C3)	Carb. Sandstone	9.8	712	0.03		0.9	41.2	-40.3	44.8	NAF (Barren)
13	EB1231346009	AMD082	MC5014 (CD6)	87.0	100.0	13.0	Drill Chip	Overburden	Siltstone	8.3	398	0.01		0.3	10.3	-10.0	33.6	NAF (Barren)
	EB1231346010	AMD083	MC5014 (CD6)	101.0	112.0	11.0	Drill Chip	Overburden	Siltstone	8.3	526	0.01		0.3	25.7	-25.4	83.9	NAF (Barren)
	EB1231346011	AMD084	MC5014 (CD6)	113.0	124.0	11.0	Drill Chip	Overburden	Siltstone	8.5	470	0.02		0.6	66.1	-65.5	107.9	NAF (Barren)
	EB1231346012	AMD085	MC5014 (CD6)	125.0	136.0	11.0	Drill Chip	Overburden	Siltstone	8.4	680	0.02		0.6	33.2	-32.6	54.2	NAF (Barren)
14	EB1312454003	AMD100	MC5019 (H10)	22.0	34.0	12.0	Drill Chip	Overburden	Sand	8.0	190	0.005		0.2	1.0	-0.8	6.5	NAF (Barren)
	EB1312454004	AMD101	MC5019 (H10)	34.0	42.0	8.0	Drill Chip	Overburden	Sand	7.7	183	0.005		0.2	0.9	-0.7	5.9	NAF (Barren)
	EB1312454005	AMD102	MC5019 (H10)	46.0	60.0	14.0	Drill Chip	Overburden	Sand	11.5	3140	0.51		15.6	79.8	-64.2	5.1	Non-Acid Forming
	EB1312454006	AMD103	MC5019 (H10)	60.0	67.0	7.0	Drill Chip	Overburden	Sand	11.5	1520	0.07		2.1	34.0	-31.9	15.9	NAF (Barren)

Table B2: Overburden Samples Selected for Additional Geochemical (Multi-Element) Tests

RGS ME No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Source	Sample Type & Seam Code	Lithological Description	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth					(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
15	EB1313278005	AMD118	MC5016 (BC2.5)	63.1	63.3	0.2	Drill Core	OverBurden	Siltstone	7.9	140	0.05		1.5	5.0	-3.5	3.3	NAF (Barren)
	EB1313278006	AMD119	MC5016 (BC2.5)	74.2	74.4	0.2	Drill Core	OverBurden	Siltstone	7.7	138	0.03		0.9	6.0	-5.1	6.5	NAF (Barren)
16	EB1313889008	AMD150	MC5020A (L16)	105.6	105.9	0.3	Drill Core	Interburden (C5/C2)	Sandstone	9.4	152	0.04		1.2	316.0	-314.8	258.0	NAF (Barren)
	EB1313889009	AMD151	MC5020A (L16)	117.0	117.2	0.2	Drill Core	Interburden (C5/C2)	Sandstone	9.6	187	0.04		1.2	256.0	-254.8	209.0	NAF (Barren)
	EB1313889010	AMD152	MC5020A (L16)	135.6	135.8	0.2	Drill Core	Interburden (C5/C2)	Sandstone	8.9	95	0.07		2.1	6.7	-4.6	3.1	NAF (Barren)
17	EB1313885001	AMD159	MC5025A (MB6)	0.0	16.0	16.0	Drill Chip	Overburden	Sand	6.3	75	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
	EB1313885002	AMD160	MC5025A (MB6)	17.0	28.0	11.0	Drill Chip	Overburden	Gravel	6.4	146	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
	EB1313885003	AMD161	MC5025A (MB6)	29.0	48.0	19.0	Drill Chip	Overburden	Sand/Clay	7.9	301	0.02		0.6	3.5	-2.9	5.7	NAF (Barren)
	EB1313885004	AMD162	MC5025A (MB6)	49.0	77.0	28.0	Drill Chip	Overburden	Claystone	7.2	199	0.03		0.9	0.3	0.7	0.3	NAF (Barren)
18	EB1315494004	AMD180	MC5035 (CD 4.5)	48.5	49.0	0.5	Drill Core	Overburden	Sandstone/Siltstone	7.2	33	0.005		0.2	3.0	-2.8	19.6	NAF (Barren)
	EB1315494005	AMD181	MC5035 (CD 4.5)	58.7	58.9	0.3	Drill Core	Overburden	Siltstone	6.6	119	0.05		1.5	4.3	-2.8	2.8	NAF (Barren)
	EB1315494006	AMD182	MC5035 (CD 4.5)	67.8	68.3	0.5	Drill Core	Overburden	Claystone	7.8	107	0.06		1.8	9.0	-7.2	4.9	NAF (Barren)
	EB1315494007	AMD183	MC5035 (CD 4.5)	74.3	74.6	0.3	Drill Core	Overburden	Carb Claystone	7.5	111	0.19	0.074	2.3	8.4	-6.1	3.7	NAF (Barren)
19	EB1316687003	AMD197	MC5026 (VWP1)	26.0	36.0	10.0	Drill Chip	Overburden	Clay / Sand	7.3	364	0.04		1.2	0.3	1.0	0.2	NAF (Barren)
	EB1316687004	AMD198	MC5026 (VWP1)	36.0	41.0	5.0	Drill Chip	Overburden	Clay	7.3	223	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
	EB1316687005	AMD199	MC5026 (VWP1)	41.0	66.0	25.0	Drill Chip	Overburden	Clay / Sand	8.0	156	0.01		0.3	1.4	-1.1	4.6	NAF (Barren)
	EB1316687006	AMD200	MC5026 (VWP1)	66.0	80.0	14.0	Drill Chip	Overburden	Clay	8.0	801	0.06		1.8	7.7	-5.9	4.2	NAF (Barren)
20	EB1317305011	AMD234	MC5033 (E 8.5)	96.0	96.3	0.2	Drill Core	Overburden	Siltstone	8.7	126	0.06		1.8	14.7	-12.9	8.0	NAF (Barren)
	EB1317305012	AMD235	MC5033 (E 8.5)	107.0	107.3	0.3	Drill Core	Overburden	Sandstone	7.8	99	0.06		1.8	22.8	-21.0	12.4	NAF (Barren)
	EB1317305013	AMD236	MC5033 (E 8.5)	119.8	120.1	0.2	Drill Core	Overburden	Sandstone	8.8	135	0.03		0.9	11.8	-10.9	12.8	NAF (Barren)
21	EB1319308012	AMD246	MC5036 (AB 3.5)	8.0	8.3	0.3	Drill Core	Overburden	Sandstone	7.2	14	0.005		0.2	1.2	-1.0	7.8	NAF (Barren)
	EB1319308013	AMD247	MC5036 (AB 3.5)	21.3	21.6	0.3	Drill Core	Overburden	Sandstone	6.7	22	0.005		0.2	0.9	-0.7	5.9	NAF (Barren)
	EB1319308014	AMD248	MC5036 (AB 3.5)	30.1	30.4	0.3	Drill Core	Overburden	Sandstone	7.0	17	0.005		0.2	0.3	-0.1	1.6	NAF (Barren)
	EB1319308015	AMD249	MC5036 (AB 3.5)	40.8	41.1	0.3	Drill Core	Overburden	Sandstone	6.9	26	0.03		0.9	0.5	0.4	0.5	NAF (Barren)
22	EB1319308028	AMD262	MC5036 (AB 3.5)	169.7	170.0	0.3	Drill Core	Overburden	Siltstone	8.9	147	0.03		0.9	16.9	-16.0	18.4	NAF (Barren)
	EB1319308029	AMD263	MC5036 (AB 3.5)	180.9	181.2	0.3	Drill Core	Overburden	Siltstone	9.0	188	0.01		0.3	18.9	-18.6	61.7	NAF (Barren)
	EB1319308030	AMD264	MC5036 (AB 3.5)	191.7	192.0	0.3	Drill Core	Overburden	Siltstone	9.0	98	0.005		0.2	15.9	-15.7	103.8	NAF (Barren)

Notes

- Current pH, EC, Alkalinity and Acidity provided for 1:5 sample:water extracts
- Scr = Chromium Reducible Sulfur; MPA = Maximum Potential Acidity; ANC = Acid Neutralising Capacity; and NAPP = Net Acid Producing Potential.
- Sample classification criteria provided in report text. NAF = Non-Acid Forming. PAF = Potentially Acid Forming.

Table B3: Multi-Element Test Results for Selected Overburden Materials

	Sample Type →		OVERBURDEN							
	RGS Sample Number →		1	2	3	4	5	6	7	8
	ALS Laboratory ID →		EB1230179036	EB1230179037	EB1230179038	EB1230179039	EB1230179040	EB1230179041	EB1230179042	EB1230179043
	Material Description →		Overburden - MC5003 - Sandstone	Overburden - MC5003 - Claystone	Roof/Floor - MC5003 - Carb. Mudstone, Tuff, Siltstone	Interburden (B1/C3) - drill hole MC5003	Overburden - MC5006 - Siltstone	Overburden/ Roof - MC5006 Siltstone, Sandstone	Roof/Floor - MC5006 - Coal & Carb. Siltstone	Interburden (C2/D2) - drill hole MC5006
Parameters	Detection Limit	NEPC ¹ Health-Based Investigation Level (HILs)-C								
Major Elements			All units mg/kg							
Aluminium (Al)	50	-	2,840	5,060	4,240	5,020	15,300	5,450	5,980	5,040
Calcium (Ca)	50	-	70	2,490	2,230	21,800	7,880	28,800	7,500	20,100
Iron (Fe)	50	-	25,300	30,900	5,560	29,200	36,000	16,200	32,600	33,500
Magnesium (Mg)	50	-	300	3,900	1,900	2,800	5,570	1,520	1,960	2,310
Phosphorus (P)	50	-	50	420	80	380	460	280	470	800
Potassium (K)	50	-	350	250	420	660	1,750	560	640	1,020
Sodium (Na)	50	-	250	280	190	200	620	400	1,200	830
Minor Elements			All units mg/kg							
Antimony (Sb)	5	-	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic (As)	5	300	<5	14	5	6	<5	6	9	<5
Boron (B)	50	20,000	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium (Cd)	1	90	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (Cr) - hexavalent	2	300 **	37	<2	5	9	31	9	6	10
Cobalt (Co)	2	300	<2	15	8	10	14	7	14	9
Copper (Cu)	5	17,000	5	18	42	30	34	44	68	40
Lead (Pb)	5	600	6	22	23	17	11	26	14	13
Manganese (Mn)	5	19,000	40	23	9	659	481	525	548	754
Molybdenum (Mo)	2	-	<2	<2	<2	<2	<2	<2	<2	<2
Nickel (Ni)	2	1,200	<2	37	34	14	27	10	19	12
Selenium (Se)	5	700	<5	<5	<5	<5	<5	<5	<5	<5
Thorium (Th)	0.1	-	7.3	9.3	12.2	6.8	7.2	13.5	6.1	6.2
Uranium (U)	0.1	-	0.5	4.4	10	0.7	0.7	1.5	0.7	0.7
Vanadium (V)	5	-	54	66	96	32	47	29	58	25
Zinc (Zn)	5	30,000	<5	109	49	73	70	72	86	75
Exchangable Cations			All units meq/100g (except Exchangable Sodium Percentage (%))							
Exch. Calcium	0.1	-	0.3	10.6	7.1	29.3	21.2	25.4	24.2	31.7
Exch. Magnesium	0.1	-	1.7	25.1	8.4	4.1	4.0	1.8	2.2	1.0
Exch. Potassium	0.1	-	0.4	0.3	0.3	0.4	0.9	0.2	0.5	0.4
Exch. Sodium	0.1	-	0.4	0.8	0.2	0.1	0.5	0.2	1.6	1.2
Cation Exchange Capacity	0.1	-	2.8	36.9	16.1	33.9	26.6	27.7	28.6	34.3
Calcium:Magnesium Ratio	-	-	0.2	0.4	0.8	7.1	5.3	14.1	11.0	31.7
Exchangable Sodium Percentage	0.1%	-	14.1	2.1	1.3	0.4	1.9	0.9	5.6	3.4

Notes: < indicates less than the laboratory limit of reporting. Shaded cells exceed applied guideline limit.

** Guideline level for Cr(VI) = 300 mg/kg. Guideline level for Cr(III) = 24% of total Cr.

1. NEPC (2013). National Environmental Protection Council (NEPC). *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*, Amendment of Schedule B1-B7 of 1999 version. *Guideline on Investigation Levels for Soil and Groundwater. Health-Based Investigation Level - HIL(C); recreational open public spaces*.

Table B3: Multi-Element Test Results for Selected Overburden Materials

	Sample Type →		OVERBURDEN							
	RGS Sample Number →		9	10	11	12	13	14	15	16
	ALS Laboratory ID →		EB1230179044	EB1230179045	EB1230179046	EB1230179047	EB1324465053	EB1324465054	EB1324465055	EB1324465056
	Material Description →		Overburden - MC5009 - Clay	Roof/Floor - MC5009 - Tuff & Carb. Claystone, Coal	Roof/Parting/Floor - MC5009 - Carb. Siltstone, Claystone	Interburden (C5/C3) - drill hole MC5009	Overburden - MC5014 (CD6) - Siltstone	Overburden - MC5019 (H10) - Sand	Overburden - MC5016 (BC2.5) - Siltstone	Interburden (C5/C2) - drill hole MC5020A (L16)
Parameters	Detection Limit	NEPC ¹ Health-Based Investigation Level (HILs)-C								
Major Elements			All units mg/kg							
Aluminium (Al)	50	-	12,100	5,330	5,120	7,240	18,700	5,190	8,010	7,320
Calcium (Ca)	50	-	1,990	9,260	3,060	45,900	13,900	18,200	2,790	73,200
Iron (Fe)	50	-	34,000	5,740	5,420	13,400	39,800	12,700	17,200	20,600
Magnesium (Mg)	50	-	5,300	1,540	990	2,820	6,460	400	1,150	3,400
Phosphorus (P)	50	-	560	70	100	600	510	70	420	590
Potassium (K)	50	-	1,780	300	550	590	2,150	540	530	810
Sodium (Na)	50	-	1,070	1,020	770	1,070	1,020	320	250	450
Minor Elements			All units mg/kg							
Antimony (Sb)	5	-	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic (As)	5	300	<5	<5	5	8	<5	6	8	6
Boron (B)	50	20,000	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium (Cd)	1	90	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (Cr) - hexavalent	2	300 **	32	2	4	20	39	39	9	24
Cobalt (Co)	2	300	14	<2	5	15	17	<2	6	14
Copper (Cu)	5	17,000	24	33	78	16	47	22	64	19
Lead (Pb)	5	600	12	23	22	7	15	8	45	9
Manganese (Mn)	5	19,000	512	93	36	533	925	50	194	2,360
Molybdenum (Mo)	2	-	<2	<2	<2	<2	<2	<2	<2	<2
Nickel (Ni)	2	1,200	26	<2	6	20	33	4	9	15
Selenium (Se)	5	700	<5	<5	<5	<5	<5	<5	<5	<5
Thorium (Th)	0.1	-	6.1	11	7.9	3.5	7.3	6.3	22.7	4.3
Uranium (U)	0.1	-	0.8	1.7	0.7	0.3	0.7	1.4	3.0	0.4
Vanadium (V)	5	-	43	32	52	33	61	44	41	31
Zinc (Zn)	5	30,000	57	56	120	60	74	11	68	63
Exchangable Cations			All units meq/100g (except Exchangable Sodium Percentage (%))							
Exch. Calcium	0.1	-	4.4	33.1	11.6	33.8	21.9	54.0	5.9	29.1
Exch. Magnesium	0.1	-	12.1	3.5	1.1	0.8	5.2	1.3	3.0	0.9
Exch. Potassium	0.1	-	0.8	0.4	0.3	0.3	1.0	0.3	0.2	0.2
Exch. Sodium	0.1	-	2.8	1.8	1.6	1.6	0.2	0.2	0.1	0.2
Cation Exchange Capacity	0.1	-	20.1	38.8	14.6	36.6	28.3	55.8	9.3	30.4
Calcium:Magnesium Ratio	-	-	0.4	9.5	10.5	42.3	4.2	41.5	2.0	32.3
Exchangable Sodium Percentage	0.1%	-	13.7	4.6	10.7	4.5	0.8	0.4	1.1	0.7

Notes: < Indicates less than the laboratory limit of reporting. Shaded cells exceed applied guideline limit.

** Guideline level for Cr(VI) = 300 mg/kg. Guideline level for Cr(III) = 24% of total Cr.

1. NEPC (2013). National Environmental Protection Council (NEPC). *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*, Amendment of Schedule B1-B7 of 1999 version. *Guideline on Investigation Levels for Soil and Groundwater. Health-Based Investigation Level - HIL(C); recreational open public spaces*.

Table B3: Multi-Element Test Results for Selected Overburden Materials

	Sample Type →		OVERBURDEN					
	RGS Sample Number →		17	18	19	20	21	22
	ALS Laboratory ID →		EB1324465057	EB1324465058	EB1324465059	EB1324465060	EB1324465061	EB1324465062
	Material Description →		Overburden - MC5025A (MB6) - Mixed Lithology	Overburden - MC5035 (CD 4.5) - Mixed Lithology	Overburden - MC5026 (VWP1) - Mixed Lithology	Overburden - MC5033 (E 8.5) - Sandstone, Siltstone	Overburden - MC5036 (AB 3.5) - Sandstone	Overburden - MC5036 (AB 3.5) - Siltstone
Parameters	Detection Limit	NEPC ¹ Health-Based Investigation Level (HILs)-C						
Major Elements			All units mg/kg					
Aluminium (Al)	50	-	5,230	10,800	6,220	14,200	4,340	22,600
Calcium (Ca)	50	-	1,360	2,600	1,140	12,800	<50	5,060
Iron (Fe)	50	-	28,600	56,900	24,200	68,300	18,100	50,900
Magnesium (Mg)	50	-	1,340	1,520	1,670	6,360	380	7,260
Phosphorus (P)	50	-	240	660	190	2,840	<50	390
Potassium (K)	50	-	870	1,060	1,380	1,350	190	2,060
Sodium (Na)	50	-	280	320	350	460	190	800
Minor Elements			All units mg/kg					
Antimony (Sb)	5	-	<5	<5	<5	<5	<5	<5
Arsenic (As)	5	300	<5	9	<5	14	<5	<5
Boron (B)	50	20,000	<50	<50	<50	<50	<50	<50
Cadmium (Cd)	1	90	<1	<1	<1	<1	<1	<1
Chromium (Cr) - hexavalent	2	300 **	26	12	36	22	40	25
Cobalt (Co)	2	300	8	14	17	20	<2	21
Copper (Cu)	5	17,000	17	44	24	28	<5	51
Lead (Pb)	5	600	7	23	16	17	7	15
Manganese (Mn)	5	19,000	267	1,260	745	992	27	407
Molybdenum (Mo)	2	-	<2	<2	<2	<2	<2	<2
Nickel (Ni)	2	1,200	14	25	19	29	2	41
Selenium (Se)	5	700	<5	<5	<5	<5	<5	<5
Thorium (Th)	0.1	-	3.5	11.8	7.8	6.4	7.5	8.5
Uranium (U)	0.1	-	0.6	1.5	1.3	1.0	0.3	0.7
Vanadium (V)	5	-	43	41	45	51	47	52
Zinc (Zn)	5	30,000	28	82	42	78	<5	89
Exchangable Cations			All units meq/100g (except Exchangable Sodium Percentage (%))					
Exch. Calcium	0.1	-	3.9	4.0	2.8	5.4	0.1	16.7
Exch. Magnesium	0.1	-	3.4	4.5	2.2	3.5	1.9	3.9
Exch. Potassium	0.1	-	0.2	0.4	0.4	0.4	<0.1	0.6
Exch. Sodium	0.1	-	0.1	0.2	<0.1	0.4	0.2	1.4
Cation Exchange Capacity	0.1	-	7.7	9.2	5.5	9.7	2.4	22.6
Calcium:Magnesium Ratio	-	-	1.1	0.9	1.3	1.5	0.1	4.3
Exchangable Sodium Percentage	0.1%	-	1.6	2.4	1.1	4.5	9.9	6.1

Notes: < indicates less than the laboratory limit of reporting. Shaded cells exceed applied guideline limit.

** Guideline level for Cr(VI) = 300 mg/kg. Guideline level for Cr(III) = 24% of total Cr.

1. NEPC (2013). National Environmental Protection Council (NEPC). *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*, Amendment of Schedule B1-B7 of 1999 version. *Guideline on Investigation Levels for Soil and Groundwater. Health-Based Investigation Level - HIL(C); recreational open public spaces*.

Table B4: Geochemical Abundance Index Results for Selected Overburden Materials

	Sample Type →		OVERBURDEN							
	RGS Sample Number →		1	2	3	4	5	6	7	8
	ALS Laboratory ID →		EB1230179036	EB1230179037	EB1230179038	EB1230179039	EB1230179040	EB1230179041	EB1230179042	EB1230179043
	Material Description →		Overburden - MC5003 - Sandstone	Overburden - MC5003 - Claystone	Roof/Floor - MC5003 - Carb. Mudstone, Tuff, Siltstone	Interburden (B1/C3) - drill hole MC5003	Overburden - MC5006 - Siltstone	Overburden/ Roof - MC5006 - Siltstone, Sandstone	Roof/Floor - MC5006 - Coal & Carb. Siltstone	Interburden (C2/D2) - drill hole MC5006
Parameters	Detection Limit	Average Crustal Abundance ¹								
Major Elements	all units in mg/kg		Geochemical Abundance Index							
Aluminium (Al)	50	71,000	0	0	0	0	0	0	0	0
Calcium (Ca)	50	15,000	0	0	0	0	0	0	0	0
Iron (Fe)	50	40,000	0	0	0	0	0	0	0	0
Magnesium (Mg)	50	5,000	0	0	0	0	0	0	0	0
Phosphorus (P)	50	800	0	0	0	0	0	0	0	0
Potassium (K)	50	14,000	0	0	0	0	0	0	0	0
Sodium (Na)	50	5,000	0	0	0	0	0	0	0	0
Minor Elements	all units in mg/kg		Geochemical Abundance Index							
Antimony (Sb)	5	5	0	0	0	0	0	0	0	0
Arsenic (As)	5	6	0	1	0	0	0	0	0	0
Boron (B)	50	100	0	0	0	0	0	0	0	0
Cadmium (Cd)	1	0.35	0	0	0	0	0	0	0	0
Chromium (Cr)	2	70	0	0	0	0	0	0	0	0
Cobalt (Co)	2	8	0	0	0	0	0	0	0	0
Copper (Cu)	5	30	0	0	0	0	0	0	1	0
Lead (Pb)	5	35	0	0	0	0	0	0	0	0
Manganese (Mn)	5	1,000	0	0	0	0	0	0	0	0
Molybdenum (Mo)	2	2	0	0	0	0	0	0	0	0
Nickel (Ni)	2	50	0	0	0	0	0	0	0	0
Selenium (Se)	5	0.4	2	2	2	2	2	2	2	2
Thorium (Th)	0.1	9	0	0	0	0	0	0	0	0
Uranium (U)	0.1	2	0	1	2	0	0	0	0	0
Vanadium (V)	5	9	2	2	3	1	2	1	2	1
Zinc (Zn)	5	90	0	0	0	0	0	0	0	0

Notes:

GAI's greater than or equal to 3 are highlighted.

1. Average Crustal Abundance values sourced from the "GARD Guide", Chapter 5 (INAP, 2009).

1. When no GARD Guide value is available for particular element, then values are taken from Bowen H.J.M.(1979) Environmental Chemistry of the Elements, Academic Press, New York, p42-43.

Table B4: Geochemical Abundance Index Results for Selected Overburden Materials

	Sample Type →		OVERBURDEN							
	RGS Sample Number →		9	10	11	12	13	14	15	16
	ALS Laboratory ID →		EB1230179044	EB1230179045	EB1230179046	EB1230179047	EB1324465053	EB1324465054	EB1324465055	EB1324465056
	Material Description →									
Parameters	Detection Limit	Average Crustal Abundance ¹	Overburden - MC5009 - Clay	Roof/Floor - MC5009 - Tuff & Carb. Claystone, Coal	Roof/Parting/Floor - MC5009 - Carb. Siltstone, Claystone	Interburden (C5/C3) - drill hole MC5009	Overburden - MC5014 (CD6) - Siltstone	Overburden - MC5019 (H10) - Sand	Overburden - MC5016 (BC2.5) - Siltstone	Interburden (C5/C2) - drill hole MC5020A (L16)
Major Elements	all units in mg/kg		Geochemical Abundance Index							
Aluminium (Al)	50	71,000	0	0	0	0	0	0	0	0
Calcium (Ca)	50	15,000	0	0	0	1	0	0	0	2
Iron (Fe)	50	40,000	0	0	0	0	0	0	0	0
Magnesium (Mg)	50	5,000	0	0	0	0	0	0	0	0
Phosphorus (P)	50	800	0	0	0	0	0	0	0	0
Potassium (K)	50	14,000	0	0	0	0	0	0	0	0
Sodium (Na)	50	5,000	0	0	0	0	0	0	0	0
Minor Elements	all units in mg/kg		Geochemical Abundance Index							
Antimony (Sb)	5	5	0	0	0	0	0	0	0	0
Arsenic (As)	5	6	0	0	0	0	0	0	0	0
Boron (B)	50	100	0	0	0	0	0	0	0	0
Cadmium (Cd)	1	0.35	0	0	0	0	0	0	0	0
Chromium (Cr)	2	70	0	0	0	0	0	0	0	0
Cobalt (Co)	2	8	0	0	0	0	1	0	0	0
Copper (Cu)	5	30	0	0	1	0	0	0	1	0
Lead (Pb)	5	35	0	0	0	0	0	0	0	0
Manganese (Mn)	5	1,000	0	0	0	0	0	0	0	1
Molybdenum (Mo)	2	2	0	0	0	0	0	0	0	0
Nickel (Ni)	2	50	0	0	0	0	0	0	0	0
Selenium (Se)	5	0.4	2	2	2	2	2	2	2	2
Thorium (Th)	0.1	9	0	0	0	0	0	0	1	0
Uranium (U)	0.1	2	0	0	0	0	0	0	0	0
Vanadium (V)	5	9	2	1	2	1	2	2	2	1
Zinc (Zn)	5	90	0	0	0	0	0	0	0	0

Notes:

GAI's greater than or equal to 3 are highlighted.

1. Average Crustal Abundance values sourced from the "GARD Guide", Chapter 5 (INAP, 2009).

1. When no GARD Guide value is available for particular element, then values are taken from Bowen H.J.M.(1979) Environmental Chemistry of the Elements, Academic Press, New York, p42-43.

Table B4: Geochemical Abundance Index Results for Selected Overburden Materials

	Sample Type →		OVERBURDEN					
	RGS Sample Number →		17	18	19	20	21	22
	ALS Laboratory ID →		EB1324465057	EB1324465058	EB1324465059	EB1324465060	EB1324465061	EB1324465062
	Material Description →		Overburden - MC5025A (MB6) - Mixed Lithology	Overburden - MC5035 (CD 4.5) - Mixed Lithology	Overburden - MC5026 (VWP1) - Mixed Lithology	Overburden - MC5033 (E 8.5) - Sandstone, Siltstone	Overburden - MC5036 (AB 3.5) - Sandstone	Overburden - MC5036 (AB 3.5) - Siltstone
Parameters	Detection Limit	Average Crustal Abundance ¹						
Major Elements	all units in mg/kg		Geochemical Abundance Index					
Aluminium (Al)	50	71,000	0	0	0	0	0	0
Calcium (Ca)	50	15,000	0	0	0	0	0	0
Iron (Fe)	50	40,000	0	0	0	0	0	0
Magnesium (Mg)	50	5,000	0	0	0	0	0	0
Phosphorus (P)	50	800	0	0	0	1	0	0
Potassium (K)	50	14,000	0	0	0	0	0	0
Sodium (Na)	50	5,000	0	0	0	0	0	0
Minor Elements	all units in mg/kg		Geochemical Abundance Index					
Antimony (Sb)	5	5	0	0	0	0	0	0
Arsenic (As)	5	6	0	0	0	1	0	0
Boron (B)	50	100	0	0	0	0	0	0
Cadmium (Cd)	1	0.35	0	0	0	0	0	0
Chromium (Cr)	2	70	0	0	0	0	0	0
Cobalt (Co)	2	8	0	0	1	1	0	1
Copper (Cu)	5	30	0	0	0	0	0	0
Lead (Pb)	5	35	0	0	0	0	0	0
Manganese (Mn)	5	1,000	0	0	0	0	0	0
Molybdenum (Mo)	2	2	0	0	0	0	0	0
Nickel (Ni)	2	50	0	0	0	0	0	0
Selenium (Se)	5	0.4	2	2	2	2	2	2
Thorium (Th)	0.1	9	0	0	0	0	0	0
Uranium (U)	0.1	2	0	0	0	0	0	0
Vanadium (V)	5	9	2	2	2	2	2	2
Zinc (Zn)	5	90	0	0	0	0	0	0

Notes:

GAI's greater than or equal to 3 are highlighted.

1. Average Crustal Abundance values sourced from the "GARD Guide", Chapter 5 (INAP, 2009).

1. When no GARD Guide value is available for particular element, then values are taken from Bowen H.J.M.(1979) Environmental Chemistry of the Elements, Academic Press, New York, p42-43.

Table B5: Multi-Element Test Results for Water Extracts from Overburden Materials

		Sample Type →		OVERBURDEN							
		RGS Sample Number →		1	2	3	4	5	6	7	8
		ALS Laboratory ID →		EB1230179036	EB1230179037	EB1230179038	EB1230179039	EB1230179040	EB1230179041	EB1230179042	EB1230179043
		Material Description →		Overburden - MC5003 - Sandstone	Overburden - MC5003 - Claystone	Roof/Floor - MC5003 - Carb. Mudstone, Tuff, Siltstone	Interburden (B1/C3) - drill hole MC5003	Overburden - MC5006 - Siltstone	Overburden/ Roof - MC5006 Siltstone, Sandstone	Roof/Floor - MC5006 - Coal & Carb. Siltstone	Interburden (C2/D2) - drill hole MC5006
		Water Quality Guidelines:									
Parameters	Detection Limit	Aquatic Ecosystems (freshwater) ¹	Livestock Drinking Water ²								
pH	0.1 pH unit	6 to 9	-	7.3	7.0	6.9	8.3	8.9	9.0	8.7	9.5
Electrical Conductivity	1 µS/cm	<1,000 [#]	3,580 [^]	255	140	151	435	366	132	617	422
Total Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	7	9	9	84	80	87	125	114
Bicarbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	7	9	9	84	70	84	118	104
Carbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	<0.2	<0.2	<0.2	<0.2	10	3	7	10
Major Ions		All element concentrations in mg/L									
Calcium (Ca)	2	-	1,000	<2	<2	<2	24	4	4	4	2
Magnesium (Mg)	2	-	-	<2	<2	<2	6	<2	<2	<2	<2
Potassium (K)	2	-	-	4	<2	4	12	8	4	4	4
Sodium (Na)	2	-	-	20	4	14	22	48	40	74	50
Chloride (Cl)	2	-	-	26	<2	6	6	14	<2	<2	<2
Phosphate (PO ₄)	2	-	-	<2	<2	<2	<2	<2	<2	<2	<2
Sulfate (SO ₄)	2	-	1,000	<2	<2	24	40	28	8	48	8
Metals		All element concentrations in mg/L									
Aluminium (Al)	0.2	0.055	5	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Antimony (Sb)	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic (As) - pentavalent	0.02	0.013 **	0.5	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	0.12
Boron (B)	0.2	0.37	5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	0.02	0.0002	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chromium (Cr) - total or (VI)*	0.02	0.001 * (hex)	1 (total)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cobalt (Co)	0.02	-	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper (Cu)	0.02	0.0014	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron (Fe)	0.2	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Lead (Pb)	0.02	0.0034	0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Manganese (Mn)	0.02	1.9	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Molybdenum (Mo)	0.02	-	0.15	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.12	0.14
Nickel (Ni)	0.02	0.011	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Selenium (Se)	0.02	0.011	0.02	<0.02	<0.02	0.08	0.06	<0.02	0.02	0.04	<0.02
Thorium (Th)	0.002	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium (U)	0.002	-	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Vanadium (V)	0.02	-	-	<0.02	<0.02	0.3	<0.02	<0.02	0.04	0.0	0.1
Zinc (Zn)	0.02	0.008	20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

* Cr (VI) = hexavalent

** 0.024 mg/L for trivalent Arsenic (III)

[#] for still water bodies only, moving rivers at low flow rates should not exceed 2200µS/cm[^] calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water.

Notes: < Indicates concentration less than the detection limit. Shaded cells indicate values which exceed applied guideline values.

1. ANZECC & ARM CANZ (2000). Trigger values for aquatic ecosystems (95% species protection)

2. ANZECC & ARM CANZ (2000). Recommended guideline limits for Livestock Drinking Water.

1 + 2. both taken from the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality", National Water Quality Management Strategy, 2000, compilation by ANZECC and ARM CANZ

Table B5: Multi-Element Test Results for Water Extracts from Overburden Materials

		Sample Type →		OVERBURDEN							
		RGS Sample Number →		9	10	11	12	13	14	15	16
		ALS Laboratory ID →		EB1230179044	EB1230179045	EB1230179046	EB1230179047	EB1324465053	EB1324465054	EB1324465055	EB1324465056
		Material Description →		Overburden - MC5009 - Clay	Roof/Floor - MC5009 - Tuff & Carb. Claystone, Coal	Roof/Parting/ Floor - MC5009 - Carb. Siltstone, Claystone	Interburden (C5/C3) - drill hole MC5009	Overburden - MC5014 (CD6) - Siltstone	Overburden - MC5019 (H10) - Sand	Overburden - MC5016 (BC2.5) - Siltstone	Interburden (C5/C2) - drill hole MC5020 (L16)
		Water Quality Guidelines:									
Parameters	Detection Limit	Aquatic Ecosystems (freshwater) ¹	Livestock Drinking Water ²								
pH	0.1 pH unit	6 to 9	-	7.6	9.2	8.6	9.8	8.8	11.2	8.2	8.8
Electrical Conductivity	1 µS/cm	<1,000 [#]	3,580 [^]	314	396	236	471	269	1,110	188	204
Total Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	26	155	48	126	96	179	41	74
Bicarbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	26	152	48	102	82	<0.2	41	60
Carbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	<0.2	3	<0.2	24	14	76	<0.2	14
Major Ions		All element concentrations in mg/L									
Calcium (Ca)	2	-	1,000	<2	8	<2	<2	4	190	6	6
Magnesium (Mg)	2	-	-	<2	<2	<2	<2	<2	<2	2	<2
Potassium (K)	2	-	-	<2	4	<2	2	16	10	4	4
Sodium (Na)	2	-	-	26	72	38	60	36	30	22	32
Chloride (Cl)	2	-	-	22	<2	<2	<2	8	12	4	<2
Phosphate (PO ₄)	2	-	-	<2	<2	<2	<2	<2	<2	<2	<2
Sulfate (SO ₄)	2	-	1,000	14	4	26	16	32	342	36	26
Metals		All element concentrations in mg/L									
Aluminium (Al)	0.2	0.055	5	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	<0.2	<0.2
Antimony (Sb)	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic (As) - pentavalent	0.02	0.013 **	0.5	<0.02	<0.02	<0.02	0.18	<0.02	<0.02	0.02	0.04
Boron (B)	0.2	0.37	5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	0.02	0.0002	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chromium (Cr) - total or (VI)*	0.02	0.001 * (hex)	1 (total)	<0.02	<0.02	<0.02	<0.02	<0.02	0.1	<0.02	<0.02
Cobalt (Co)	0.02	-	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper (Cu)	0.02	0.0014	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron (Fe)	0.2	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Lead (Pb)	0.02	0.0034	0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Manganese (Mn)	0.02	1.9	-	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02
Molybdenum (Mo)	0.02	-	0.15	<0.02	<0.02	0.04	0.18	<0.02	0.04	<0.02	0.04
Nickel (Ni)	0.02	0.011	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Selenium (Se)	0.02	0.011	0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.02	0.06	<0.02
Thorium (Th)	0.002	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium (U)	0.002	-	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Vanadium (V)	0.02	-	-	<0.02	0.1	0.1	0.1	0.02	0.16	0.02	<0.02
Zinc (Zn)	0.02	0.008	20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

* Cr (VI) = hexavalent

** 0.024 mg/L for trivalent Arsenic (III)

[#] for still water bodies only, moving rivers at low flow rates should not exceed 2200µS/cm[^] calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water.

Notes: < Indicates concentration less than the detection limit. Shaded cells indicate values which exceed applied guideline values.

1. ANZECC & ARMICANZ (2000). Trigger values for aquatic ecosystems (95% species protection)

2. ANZECC & ARMICANZ (2000). Recommended guideline limits for Livestock Drinking Water.

1 + 2. both taken from the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality", National Water Quality Management Strategy, 2000, compilation by ANZECC and ARMICANZ

Table B5: Multi-Element Test Results for Water Extracts from Overburden Materials

		Sample Type →		OVERBURDEN					
		RGS Sample Number →		17	18	19	20	21	22
		ALS Laboratory ID →		EB1324465057	EB1324465058	EB1324465059	EB1324465060	EB1324465061	EB1324465062
		Material Description →		Overburden - MC5025A (MB6) - Mixed Lithology	Overburden - MC5035 (CD 4.5) - Mixed Lithology	Overburden - MC5026 (VWP1) - Mixed Lithology	Overburden - MC5033 (E 8.5) - Sandstone, Siltstone	Overburden - MC5036 (AB 3.5) - Sandstone	Overburden - MC5036 (AB 3.5) - Siltstone
		Water Quality Guidelines:							
Parameters	Detection Limit	Aquatic Ecosystems (freshwater) ¹	Livestock Drinking Water ²						
pH	0.1 pH unit	6 to 9	-	8.1	7.2	7.7	8.5	6.6	8.9
Electrical Conductivity	1 µS/cm	<1,000 [#]	3,580 [^]	218	115	311	107	24	134
Total Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	62	21	14	46	9	57
Bicarbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	62	21	14	43	9	43
Carbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	<0.2	<0.2	<0.2	3	<0.2	14
Major Ions		All element concentrations in mg/L							
Calcium (Ca)	2	-	1,000	4	<2	8	<2	<2	<2
Magnesium (Mg)	2	-	-	4	<2	4	<2	<2	<2
Potassium (K)	2	-	-	4	4	18	<2	<2	<2
Sodium (Na)	2	-	-	28	16	34	18	4	24
Chloride (Cl)	2	-	-	22	4	26	4	2	4
Phosphate (PO ₄)	2	-	-	<2	<2	<2	<2	<2	<2
Sulfate (SO ₄)	2	-	1,000	14	24	82	10	<2	4
Metals		All element concentrations in mg/L							
Aluminium (Al)	0.2	0.055	5	<0.2	<0.2	<0.2	<0.2	0.4	0.4
Antimony (Sb)	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic (As) - pentavalent	0.02	0.013 **	0.5	<0.02	<0.02	<0.02	0.12	<0.02	<0.02
Boron (B)	0.2	0.37	5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	0.02	0.0002	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chromium (Cr) - total or (VI)*	0.02	0.001 * (hex)	1 (total)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cobalt (Co)	0.02	-	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper (Cu)	0.02	0.0014	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron (Fe)	0.2	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Lead (Pb)	0.02	0.0034	0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Manganese (Mn)	0.02	1.9	-	0.04	0.02	<0.02	<0.02	0.02	<0.02
Molybdenum (Mo)	0.02	-	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel (Ni)	0.02	0.011	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Selenium (Se)	0.02	0.011	0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02
Thorium (Th)	0.002	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium (U)	0.002	-	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Vanadium (V)	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	0.06
Zinc (Zn)	0.02	0.008	20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

* Cr (VI) = hexavalent

** 0.024 mg/L for trivalent Arsenic (III)

[#] for still water bodies only, moving rivers at low flow rates should not exceed 2200µS/cm[^] calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water.

Notes: < Indicates concentration less than the detection limit. Shaded cells indicate values which exceed applied guideline values.

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2. ANZECC & ARMCANZ (2000). Recommended guideline limits for Livestock Drinking Water.

1 + 2. both taken from the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality", National Water Quality Management Strategy, 2000, compilation by ANZECC and ARMCANZ

Table B-6: Overburden Samples Selected for Kinetic Leach Column (KLC) Tests

RGS KLC No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Sample Type & Seam Code	Lithology	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth					(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
OVERBURDEN																		
5	EB1227477069	AMD069	MC5003	126.1	126.5	0.4	Drill Core	Interburden (B1/C3)	Sandstone	8.8	167	0.02		0.6	107.0	-106.4	174.7	NAF (Barren)
	EB1227477070	AMD070	MC5003	128.5	128.8	0.3	Drill Core	Interburden (B1/C3)	Carb. Claystone	8.1	569	0.28	0.05	1.5	7.3	-5.8	4.8	NAF (Barren)
	EB1227477071	AMD071	MC5003	132.8	133.2	0.4	Drill Core	Interburden (B1/C3)	Carb. Siltstone	8.3	568	0.05		1.5	4.4	-2.9	2.9	NAF (Barren)
6	EB1227477044	AMD044	MC5006	227.2	227.5	0.4	Drill Core	Overburden	Sandstone	9.5	133	0.005		0.2	274.0	-273.8	1789.4	NAF (Barren)
	EB1227477045	AMD045	MC5006	233.9	234.2	0.3	Drill Core	Overburden	Siltstone	9.0	104	0.02		0.6	7.0	-6.4	11.4	NAF (Barren)
	EB1227477046	AMD046	MC5006	238.6	238.9	0.3	Drill Core	Overburden	Sandstone	9.0	192	0.01		0.3	7.1	-6.8	23.2	NAF (Barren)
	EB1227477047	AMD047	MC5006	240.4	240.8	0.4	Drill Core	Overburden	Siltstone	8.8	97	0.02		0.6	6.5	-5.9	10.6	NAF (Barren)
7	EB1227477012	AMD012	MC5009	160.8	161.1	0.3	Drill Core	Roof (AU3)	Carb. Claystone/Tuff	9.2	287	0.05		1.5	10.6	-9.1	6.9	NAF (Barren)
	EB1227477013	AMD013	MC5009	178.4	178.8	0.4	Drill Core	Roof (B3)	Tuff	9.9	757	0.04		1.2	37.6	-36.4	30.7	NAF (Barren)
	EB1227477014	AMD014	MC5009	187.2	187.5	0.3	Drill Core	Floor (B1)	Dull Coal	9.0	145	0.23	0.006	0.2	8.6	-8.4	46.8	NAF (Barren)
8	EB1227477020	AMD020	MC5009	199.7	199.9	0.3	Drill Core	Interburden (C5/C3)	Sandstone	9.8	669	0.02		0.6	98.3	-97.7	160.5	NAF (Barren)
	EB1227477021	AMD021	MC5009	201.3	201.7	0.4	Drill Core	Interburden (C5/C3)	Dull Coal/Carb. Siltstone	9.6	258	0.02		0.6	7.3	-6.7	11.9	NAF (Barren)
	EB1227477022	AMD022	MC5009	212.0	212.5	0.5	Drill Core	Interburden (C5/C3)	Sandstone	9.9	245	0.02		0.6	329.0	-328.4	537.1	NAF (Barren)
	EB1227477023	AMD023	MC5009	221.5	222.0	0.5	Drill Core	Interburden (C5/C3)	Carb. Sandstone	9.8	712	0.03		0.9	41.2	-40.3	44.8	NAF (Barren)

Notes:

1. Current pH, EC, Alkalinity and Acidity provided for 1:5 sample:water extracts
2. Scr = Chromium Reducible Sulfur; MPA = Maximum Potential Acidity; ANC = Acid Neutralising Capacity; and NAPP = Net Acid Producing Potential.
3. Sample classification detail provided in report text.

Table B7: Acid Base Account Results for Coal Reject and Raw Coal Materials

RGS Sample No.	ALS Laboratory Sample ID	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Source	Material Description & Seam Code	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth				(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
RAW COAL																	
1	EB1206683001	31757	2009_03	226.9	231.6	4.7	Drill Core	Raw Coal (AU3-AU1)	6.8	824	0.28		8.6	21.6	-13.0	2.5	NAF
2	EB1206683002	31759	2009_03	232.7	234.3	1.6	Drill Core	Raw Coal (AL5)	7.0	542	0.18		5.5	22.0	-16.5	4.0	NAF
3	EB1206683003	31760	2009_03	234.8	237.3	2.5	Drill Core	Raw Coal (AL4)	7.0	556	0.12		3.7	37.8	-34.1	10.3	NAF
4	EB1206683004	31761	2009_03	237.7	240.8	3.1	Drill Core	Raw Coal (AL3-AL2)	7.0	557	0.16		4.9	39.6	-34.7	8.1	NAF
5	EB1206683005	31762	2009_03	241.7	243.9	2.2	Drill Core	Raw Coal (AL1)	7.0	433	0.22		6.7	30.6	-23.9	4.5	NAF
6	EB1206683006	31763	2009_03	244.4	246.5	2.1	Drill Core	Raw Coal (B3)	7.2	610	0.17		5.2	30.0	-24.8	5.8	NAF
7	EB1206683007	31765	2009_03	248.3	250.0	1.7	Drill Core	Raw Coal (B2)	7.2	591	0.13		4.0	36.0	-32.0	9.0	NAF
8	EB1206683008	31766	2009_03	250.7	251.5	0.8	Drill Core	Raw Coal (B1)	7.1	480	0.14		4.3	31.8	-27.5	7.4	NAF
9	EB1206683009	31767	2009_03	255.0	256.5	1.5	Drill Core	Raw Coal(C5)	6.6	463	0.16	0.013	0.4	6.2	-5.8	15.6	NAF (Barren)
10	EB1206683010	31768	2009_03	277.5	278.5	1.0	Drill Core	Raw Coal (C3)	6.8	391	0.18	0.022	0.7	8.4	-7.7	12.5	NAF (Barren)
11	EB1206683011	31769	2009_03	281.5	282.0	0.5	Drill Core	Raw Coal (C2)	6.8	310	0.26		8.0	16.8	-8.8	2.1	NAF
12	EB1206683012	31770	2009_03	295.3	298.4	3.1	Drill Core	Raw Coal (D2-D1)	7.2	283	0.16		4.9	17.0	-12.1	3.5	NAF
13	EB1206683014	31511	2009_08	90.5	93.5	3.0	Drill Core	Raw Coal (AU4-AU2)	6.2	323	0.18	0.025	0.8	7.6	-6.8	9.9	NAF (Barren)
14	EB1206683015	31510	2009_08	93.5	96.5	3.0	Drill Core	Raw Coal (AU2-AU1)	6.1	273	0.18	0.042	1.3	5.9	-4.6	4.6	NAF (Barren)
15	EB1206683016	31509	2009_08	96.8	98.8	2.0	Drill Core	Raw Coal (AL5)	6.1	235	0.17	0.022	0.7	4.9	-4.2	7.3	NAF (Barren)
16	EB1206683017	31508	2009_08	99.1	99.8	0.7	Drill Core	Raw Coal (AL5)	5.9	298	0.14		4.3	15.4	-11.1	3.6	NAF
17	EB1206683018	31507	2009_08	99.9	102.9	3.0	Drill Core	Raw Coal (AL4)	6.1	285	0.15		4.6	17.0	-12.4	3.7	NAF
18	EB1206683019	31506	2009_08	103.0	106.0	3.0	Drill Core	Raw Coal (AL3-AL2)	6.2	260	0.24		7.4	36.0	-28.7	4.9	NAF
19	EB1206683020	31505	2009_08	106.0	109.4	3.4	Drill Core	Raw Coal (AL2-AL1)	6.2	230	0.25		7.7	17.3	-9.6	2.3	NAF
20	EB1206683021	31504	2009_08	109.4	112.4	3.0	Drill Core	Raw Coal (AL1-B3)	6.5	302	0.23		7.0	14.6	-7.6	2.1	NAF
21	EB1206683022	31503	2009_08	112.7	114.9	2.2	Drill Core	Raw Coal (B2)	6.9	553	0.14		4.3	39.6	-35.3	9.2	NAF
22	EB1206683023	31502	2009_08	114.9	117.9	3.0	Drill Core	Raw Coal (B2-B1)	6.8	542	0.18		5.5	16.9	-11.4	3.1	NAF
23	EB1206683024	31947	2009_08	168.4	170.3	1.9	Drill Core	Raw Coal (D2)	6.1	365	0.25	0.040	1.2	6.6	-5.4	5.4	NAF (Barren)
24	EB1206683025	31946	2009_08	170.9	172.1	1.2	Drill Core	Raw Coal (D1)	6.2	238	0.18	0.011	0.3	6.3	-6.0	18.7	NAF (Barren)
25	EB1206683026	31772	2009_22	136.7	141.4	4.7	Drill Core	Raw Coal (AU2-AU1)	6.1	248	0.17	0.013	0.4	7.9	-7.5	19.8	NAF (Barren)
26	EB1206683027	31773	2009_22	141.9	144.3	2.4	Drill Core	Raw Coal (AL6-AL5)	6.8	605	0.21		6.4	38.4	-32.0	6.0	NAF
27	EB1206683028	31774	2009_22	144.7	147.5	2.8	Drill Core	Raw Coal (AL4)	6.9	568	0.14		4.3	43.8	-39.5	10.2	NAF
28	EB1206683029	31775	2009_22	147.9	150.4	2.5	Drill Core	Raw Coal (AL3)	6.8	519	0.16		4.9	34.8	-29.9	7.1	NAF
29	EB1206683030	31776	2009_22	152.0	154.5	2.5	Drill Core	Raw Coal (AL1)	6.3	269	0.26	0.011	0.3	7.4	-7.1	22.0	NAF (Barren)
30	EB1206683031	31777	2009_22	155.0	157.3	2.3	Drill Core	Raw Coal (B3)	7.0	624	0.19		5.8	37.8	-32.0	6.5	NAF
31	EB1206683032	31778	2009_22	157.6	158.3	0.7	Drill Core	Raw Coal (B2)	6.5	371	0.12		3.7	8.2	-4.5	2.2	NAF
32	EB1206683033	31779	2009_22	159.2	159.9	0.7	Drill Core	Raw Coal (B2)	6.8	581	0.19		5.8	39.6	-33.8	6.8	NAF
33	EB1206683034	31780	2009_22	160.2	160.7	0.5	Drill Core	Raw Coal (B2)	6.8	615	0.20		6.1	39.0	-32.9	6.4	NAF
34	EB1206683035	31781	2009_22	161.7	163.0	1.3	Drill Core	Raw Coal (B1)	6.8	478	0.11		3.4	12.4	-9.0	3.7	NAF

Table B7: Acid Base Account Results for Coal Reject and Raw Coal Materials

RGS Sample No.	ALS Laboratory Sample ID	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Source	Material Description & Seam Code	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth				(μS/cm)	(%)	(kg H ₂ SO ₄ /t)					
35	EB1206683036	31782	2009_22	166.5	168.4	1.9	Drill Core	Raw Coal (C5)	6.2	426	0.28	0.037	1.1	11.8	-10.7	10.4	NAF (Barren)
36	EB1206683037	31783	2009_22	209.5	210.6	1.1	Drill Core	Raw Coal (C2-C1)	6.4	345	0.22	0.003	0.1	7.8	-7.7	101.9	NAF (Barren)
37	EB1206683038	31784	2009_22	212.8	215.5	2.7	Drill Core	Raw Coal (D3-D2)	6.6	294	0.17		5.2	12.0	-6.8	2.3	NAF
38	EB1206683039	31785	2009_22	216.9	217.8	0.9	Drill Core	Raw Coal (D1)	6.1	355	0.21	0.003	0.1	8.5	-8.4	111.0	NAF (Barren)
39	EB1206683043	31938	2009_34	102.9	103.8	0.9	Drill Core	Raw Coal (D2)	5.7	298	0.22	0.013	0.4	4.9	-4.5	12.3	NAF (Barren)
40	EB1206683044	31939	2009_34	104.2	105.7	1.5	Drill Core	Raw Coal (D1)	5.1	146	0.17	0.016	0.5	6.9	-6.4	14.1	NAF (Barren)
41	EB1206683047	31541	2009_40	152.0	154.0	2.0	Drill Core	Raw Coal (AU4)	6.7	240	0.07		2.1	14.6	-12.5	6.8	NAF (Barren)
42	EB1206683048	31540	2009_40	154.0	157.0	3.0	Drill Core	Raw Coal (AU3)	6.4	317	0.12		3.7	39.6	-35.9	10.8	NAF
43	EB1206683049	31539	2009_40	157.4	158.9	1.5	Drill Core	Raw Coal (AU2)	6.1	298	0.24	0.030	0.9	8.6	-7.7	9.4	NAF (Barren)
44	EB1206683050	31538	2009_40	158.9	161.9	3.0	Drill Core	Raw Coal (AU2)	6.1	281	0.18		5.5	32.4	-26.9	5.9	NAF
45	EB1206683051	31537	2009_40	162.6	164.0	1.4	Drill Core	Raw Coal (AL5)	6.8	664	0.12		3.7	34.8	-31.1	9.5	NAF
46	EB1206683052	31536	2009_40	164.5	165.6	1.1	Drill Core	Raw Coal (AL4)	5.9	364	0.15	0.025	0.8	8.4	-7.6	11.0	NAF (Barren)
47	EB1206683053	31535	2009_40	165.6	168.6	3.0	Drill Core	Raw Coal (AL4-AL3)	6.1	302	0.15		4.6	175.0	-170.4	38.1	NAF
48	EB1206683054	31534	2009_40	168.6	171.6	3.0	Drill Core	Raw Coal (AL3-AL2)	6.0	258	0.20		6.1	176.0	-169.9	28.7	NAF
49	EB1206683055	31533	2009_40	171.6	174.5	2.9	Drill Core	Raw Coal (AL2-AL1)	6.0	294	0.33	0.019	0.6	6.2	-5.6	10.7	NAF (Barren)
50	EB1206683056	31532	2009_40	175.0	176.6	1.6	Drill Core	Raw Coal (B3)	6.9	579	0.24		7.4	55.2	-47.9	7.5	NAF
51	EB1206683057	31531	2009_40	176.6	179.6	3.0	Drill Core	Raw Coal (B3-B2)	6.7	399	0.18	0.010	0.3	8.2	-7.9	26.8	NAF (Barren)
52	EB1206683058	31530	2009_40	179.6	182.2	2.6	Drill Core	Raw Coal (B2)	6.2	308	0.23	0.007	0.2	7.1	-6.9	33.1	NAF (Barren)
53	EB1206683059	31529	2009_40	182.2	184.0	1.8	Drill Core	Raw Coal (B1)	5.6	404	0.28	0.020	0.6	8.5	-7.9	13.9	NAF (Barren)
54	EB1206683060	31528	2009_40	198.0	199.4	1.4	Drill Core	Raw Coal (C3)	6.1	232	0.24	0.023	0.7	6.2	-5.5	8.8	NAF (Barren)
55	EB1206683061	31527	2009_40	201.9	202.4	0.5	Drill Core	Raw Coal (C2)	5.9	273	0.23	0.003	0.1	8.2	-8.1	107.1	NAF (Barren)
56	EB1206683062	31526	2009_40	228.2	229.8	1.6	Drill Core	Raw Coal (D1)	5.8	341	0.19	0.028	0.9	8.4	-7.5	9.8	NAF (Barren)
COARSE REJECT (>5mm)																	
57	EB1206683065	31757	2009_03	226.9	231.6	4.7	Coal Quality Lab	Coarse Reject (AU3-AU1)	7.0	1290	0.18		5.5	50.4	-44.9	9.1	NAF
58	EB1206683066	31758	2009_03	232.0	232.4	0.4	Coal Quality Lab	Coarse Reject (AU1)	7.2	761	0.10		3.1	63.1	-60.0	20.6	NAF (Barren)
59	EB1206683067	31759 - 31762	2009_03	Composite		-	Coal Quality Lab	Coarse Reject (AL5-AL1)	7.5	923	0.11		3.4	52.8	-49.4	15.7	NAF
60	EB1206683068	31763	2009_03	244.4	246.5	2.1	Coal Quality Lab	Coarse Reject (B3)	7.3	997	0.16		4.9	37.8	-32.9	7.7	NAF
61	EB1206683069	31765 - 31767	2009_03	Composite		-	Coal Quality Lab	Coarse Reject (B2-B1,C5)	7.4	1130	0.05		1.5	55.8	-54.3	36.4	NAF (Barren)
62	EB1206683070	31770	2009_03	295.3	298.4	3.1	Coal Quality Lab	Coarse Reject (D2-D1)	7.0	960	0.02		0.6	9.0	-8.4	14.7	NAF (Barren)
63	EB1206683072	31505 - 31511	2009_08	Composite		-	Coal Quality Lab	Coarse Reject (AU4-AU1, AL5-AL1)	5.9	670	0.11		3.4	8.4	-5.0	2.5	NAF
64	EB1206683073	31502 - 31504	2009_08	Composite		-	Coal Quality Lab	Coarse Reject (AL1, B3-B1)	6.7	1200	0.07		2.1	36.6	-34.5	17.1	NAF (Barren)
65	EB1206683074	31501	2009_08	121.5	122.9	1.4	Coal Quality Lab	Coarse Reject (C5)	5.9	936	0.10		3.1	15.8	-12.7	5.2	NAF (Barren)
66	EB1206683075	31950	2009_08	157.2	159.2	2.0	Coal Quality Lab	Coarse Reject (C1)	6.6	831	0.16		4.9	18.3	-13.4	3.7	NAF
67	EB1206683076	31946, 31947	2009_08	Composite		-	Coal Quality Lab	Coarse Reject (D2-D1)	6.2	1160	0.28	0.201	6.2	17.0	-10.8	2.8	NAF

Table B7: Acid Base Account Results for Coal Reject and Raw Coal Materials

RGS Sample No.	ALS Laboratory Sample ID	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Source	Material Description & Seam Code	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth				(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
68	EB1206683079	31772 - 31776	2009_22	Composite		-	Coal Quality Lab	Coarse Reject (AU2-AU1, AL6-AL1)	6.9	1300	0.12		3.7	51.0	-47.3	13.9	NAF
69	EB1206683080	31777	2009_22	155.0	157.3	2.3	Coal Quality Lab	Coarse Reject (B3)	7.1	1040	0.09		2.8	37.2	-34.4	13.5	NAF (Barren)
70	EB1206683081	31778 - 31780	2009_22	Composite		-	Coal Quality Lab	Coarse Reject (B2)	6.8	1330	0.05		1.5	68.5	-67.0	44.7	NAF (Barren)
71	EB1206683082	31781	2009_22	161.7	163.0	1.3	Coal Quality Lab	Coarse Reject (B1)	6.9	1310	0.06		1.8	20.9	-19.1	11.4	NAF (Barren)
72	EB1206683083	31782	2009_22	166.5	168.4	1.9	Coal Quality Lab	Coarse Reject (C5)	6.1	1800	0.11		3.4	33.0	-29.6	9.8	NAF
73	EB1206683088	31538 - 31541	2009_40	Composite		-	Coal Quality Lab	Coarse Reject (AU4-AU2)	6.1	647	0.06		1.8	32.4	-30.6	17.6	NAF (Barren)
74	EB1206683089	31537	2009_40	162.6	164.0	1.4	Coal Quality Lab	Coarse Reject (AL5)	7.1	806	0.04		1.2	32.4	-31.2	26.4	NAF (Barren)
75	EB1206683090	31532 - 31536	2009_40	Composite		-	Coal Quality Lab	Coarse Reject (AL4-AL1, B3)	6.9	1000	0.16		4.9	47.4	-42.5	9.7	NAF
76	EB1206683091	31531	2009_40	176.6	179.6	3.0	Coal Quality Lab	Coarse Reject (B3-B2)	7.2	733	0.07		2.1	37.2	-35.1	17.4	NAF (Barren)
77	EB1206683092	31529, 31530	2009_40	Composite		-	Coal Quality Lab	Coarse Reject (B2-B1)	5.8	900	0.08		2.5	48.6	-46.2	19.8	NAF (Barren)
78	EB1206683093	31527, 31528	2009_40	Composite		-	Coal Quality Lab	Coarse Reject (C3-C2)	6.0	1060	0.09		2.8	17.7	-14.9	6.4	NAF (Barren)
79	EB1206683094	31526	2009_40	228.2	229.8	1.6	Coal Quality Lab	Coarse Reject (D1)	6.8	595	0.14		4.3	16.2	-11.9	3.8	NAF
FINE REJECT (<5mm)																	
80	EB1206683097	31950	2009_08	157.2	159.2	2.0	Coal Quality Lab	Fine Reject (C1)	6.2	358	0.26	0.023	0.7	8.9	-8.2	12.6	NAF (Barren)
81	EB1206683099	31527, 31528	2009_40	Composite		-	Coal Quality Lab	Fine Reject (C3-C2)	5.1	466	0.26	0.070	2.1	5.9	-3.8	2.8	NAF (Barren)

Notes

1. Current pH and EC provided for 1:5 sample:water extracts
2. Scr = Chromium Reducible Sulfur; MPA = Maximum Potential Acidity; ANC = Acid Neutralising Capacity; and NAPP = Net Acid Producing Potential.
3. Sample classification criteria provided in report text. NAF = Non-Acid Forming. PAF = Potentially Acid Forming.

Table B8: Coal Reject and Raw Coal Samples Selected for Additional Geochemical (Multi-Element) Tests

RGS ME No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Material Description & Seam Code	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth			(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
RAW COAL																
1	EB1206683001	31757	2009_03	226.9	231.6	4.7	Raw Coal (AU3-AU1)	6.8	824	0.28		8.6	21.6	-13.0	2.5	NAF
	EB1206683002	31759	2009_03	232.7	234.3	1.6	Raw Coal (AL5)	7.0	542	0.18		5.5	22.0	-16.5	4.0	NAF
	EB1206683003	31760	2009_03	234.8	237.3	2.5	Raw Coal (AL4)	7.0	556	0.12		3.7	37.8	-34.1	10.3	NAF
	EB1206683004	31761	2009_03	237.7	240.8	3.1	Raw Coal (AL3-AL2)	7.0	557	0.16		4.9	39.6	-34.7	8.1	NAF
	EB1206683005	31762	2009_03	241.7	243.9	2.2	Raw Coal (AL1)	7.0	433	0.22		6.7	30.6	-23.9	4.5	NAF
	EB1206683006	31763	2009_03	244.4	246.5	2.1	Raw Coal (B3)	7.2	610	0.17		5.2	30.0	-24.8	5.8	NAF
	EB1206683007	31765	2009_03	248.3	250.0	1.7	Raw Coal (B2)	7.2	591	0.13		4.0	36.0	-32.0	9.0	NAF
	EB1206683008	31766	2009_03	250.7	251.5	0.8	Raw Coal (B1)	7.1	480	0.14		4.3	31.8	-27.5	7.4	NAF
2	EB1206683009	31767	2009_03	255.0	256.5	1.5	Raw Coal(C5)	6.6	463	0.16	0.013	0.4	6.2	-5.8	15.6	NAF (Barren)
	EB1206683010	31768	2009_03	277.5	278.5	1.0	Raw Coal (C3)	6.8	391	0.18	0.022	0.7	8.4	-7.7	12.5	NAF (Barren)
	EB1206683011	31769	2009_03	281.5	282.0	0.5	Raw Coal (C2)	6.8	310	0.26		8.0	16.8	-8.8	2.1	NAF
	EB1206683012	31770	2009_03	295.3	298.4	3.1	Raw Coal (D2-D1)	7.2	283	0.16		4.9	17.0	-12.1	3.5	NAF
	EB1206683013	31771	2009_03	305.7	307.5	1.8	Raw Coal (E2-E1)	4.5	1030	0.90	0.734	22.5	3.7	18.8	0.2	PAF
3	EB1206683014	31511	2009_08	90.5	93.5	3.0	Raw Coal (AU4-AU2)	6.2	323	0.18	0.025	0.8	7.6	-6.8	9.9	NAF (Barren)
	EB1206683015	31510	2009_08	93.5	96.5	3.0	Raw Coal (AU2-AU1)	6.1	273	0.18	0.042	1.3	5.9	-4.6	4.6	NAF (Barren)
	EB1206683016	31509	2009_08	96.8	98.8	2.0	Raw Coal (AL5)	6.1	235	0.17	0.022	0.7	4.9	-4.2	7.3	NAF (Barren)
	EB1206683017	31508	2009_08	99.1	99.8	0.7	Raw Coal (AL5)	5.9	298	0.14		4.3	15.4	-11.1	3.6	NAF
	EB1206683018	31507	2009_08	99.9	102.9	3.0	Raw Coal (AL4)	6.1	285	0.15		4.6	17.0	-12.4	3.7	NAF
	EB1206683019	31506	2009_08	103.0	106.0	3.0	Raw Coal (AL3-AL2)	6.2	260	0.24		7.4	36.0	-28.7	4.9	NAF
	EB1206683020	31505	2009_08	106.0	109.4	3.4	Raw Coal (AL2-AL1)	6.2	230	0.25		7.7	17.3	-9.6	2.3	NAF
	EB1206683021	31504	2009_08	109.4	112.4	3.0	Raw Coal (AL1-B3)	6.5	302	0.23		7.0	14.6	-7.6	2.1	NAF
	EB1206683022	31503	2009_08	112.7	114.9	2.2	Raw Coal (B2)	6.9	553	0.14		4.3	39.6	-35.3	9.2	NAF
	EB1206683023	31502	2009_08	114.9	117.9	3.0	Raw Coal (B2-B1)	6.8	542	0.18		5.5	16.9	-11.4	3.1	NAF
	EB1206683024	31947	2009_08	168.4	170.3	1.9	Raw Coal (D2)	6.1	365	0.25	0.04	1.2	6.6	-5.4	5.4	NAF (Barren)
	EB1206683025	31946	2009_08	170.9	172.1	1.2	Raw Coal (D1)	6.2	238	0.18	0.011	0.3	6.3	-6.0	18.7	NAF (Barren)
4	EB1206683026	31772	2009_22	136.7	141.4	4.7	Raw Coal (AU2-AU1)	6.1	248	0.17	0.013	0.4	7.9	-7.5	19.8	NAF (Barren)
	EB1206683027	31773	2009_22	141.9	144.3	2.4	Raw Coal (AL6-AL5)	6.8	605	0.21		6.4	38.4	-32.0	6.0	NAF
	EB1206683028	31774	2009_22	144.7	147.5	2.8	Raw Coal (AL4)	6.9	568	0.14		4.3	43.8	-39.5	10.2	NAF
	EB1206683029	31775	2009_22	147.9	150.4	2.5	Raw Coal (AL3)	6.8	519	0.16		4.9	34.8	-29.9	7.1	NAF
	EB1206683030	31776	2009_22	152.0	154.5	2.5	Raw Coal (AL1)	6.3	269	0.26	0.011	0.3	7.4	-7.1	22.0	NAF (Barren)
	EB1206683031	31777	2009_22	155.0	157.3	2.3	Raw Coal (B3)	7.0	624	0.19		5.8	37.8	-32.0	6.5	NAF
	EB1206683032	31778	2009_22	157.6	158.3	0.7	Raw Coal (B2)	6.5	371	0.12		3.7	8.2	-4.5	2.2	NAF
	EB1206683033	31779	2009_22	159.2	159.9	0.7	Raw Coal (B2)	6.8	581	0.19		5.8	39.6	-33.8	6.8	NAF
	EB1206683034	31780	2009_22	160.2	160.7	0.5	Raw Coal (B2)	6.8	615	0.20		6.1	39.0	-32.9	6.4	NAF
	EB1206683035	31781	2009_22	161.7	163.0	1.3	Raw Coal (B1)	6.8	478	0.11		3.4	12.4	-9.0	3.7	NAF
	EB1206683036	31782	2009_22	166.5	168.4	1.9	Raw Coal (C5)	6.2	426	0.28	0.037	1.1	11.8	-10.7	10.4	NAF (Barren)

Table B8: Coal Reject and Raw Coal Samples Selected for Additional Geochemical (Multi-Element) Tests

RGS ME No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Material Description & Seam Code	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth			(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
	EB1206683037	31783	2009_22	209.5	210.6	1.1	Raw Coal (C2-C1)	6.4	345	0.22	0.003	0.1	7.8	-7.7	101.9	NAF (Barren)
	EB1206683038	31784	2009_22	212.8	215.5	2.7	Raw Coal (D3-D2)	6.6	294	0.17		5.2	12.0	-6.8	2.3	NAF
	EB1206683039	31785	2009_22	216.9	217.8	0.9	Raw Coal (D1)	6.1	355	0.21	0.003	0.1	8.5	-8.4	111.0	NAF (Barren)
	EB1206683040	31786	2009_22	226.2	228.2	2.0	Raw Coal (E2-E1)	6.4	300	0.2	0.011	0.3	7.9	-7.6	23.5	NAF (Barren)
	EB1206683041	31787	2009_22	234.9	236.7	1.8	Raw Coal (F)	6.5	299	0.14		4.3	11.5	-7.2	2.7	NAF
	EB1206683042	31788	2009_22	247.7	249.2	1.5	Raw Coal (G)	6.6	322	0.11		3.4	7.3	-3.9	2.2	NAF
5	EB1206683043	31938	2009_34	102.9	103.8	0.9	Raw Coal (D2)	5.7	298	0.22	0.013	0.4	4.9	-4.5	12.3	NAF (Barren)
	EB1206683044	31939	2009_34	104.2	105.7	1.5	Raw Coal (D1)	5.1	146	0.17	0.016	0.5	6.9	-6.4	14.1	NAF (Barren)
	EB1206683045	31940	2009_34	111.5	111.9	0.4	Raw Coal (E2)	5.2	463	0.31	0.135	4.1	5.8	-1.7	1.4	Uncertain
	EB1206683046	31941	2009_34	112.1	113.3	1.2	Raw Coal (E1)	5.1	197	0.35	0.141	4.3	5.7	-1.4	1.3	Uncertain
6	EB1206683047	31541	2009_40	152.0	154.0	2.0	Raw Coal (AU4)	6.7	240	0.07		2.1	14.6	-12.5	6.8	NAF (Barren)
	EB1206683048	31540	2009_40	154.0	157.0	3.0	Raw Coal (AU3)	6.4	317	0.12		3.7	39.6	-35.9	10.8	NAF
	EB1206683049	31539	2009_40	157.4	158.9	1.5	Raw Coal (AU2)	6.1	298	0.24	0.03	0.9	8.6	-7.7	9.4	NAF (Barren)
	EB1206683050	31538	2009_40	158.9	161.9	3.0	Raw Coal (AU2)	6.1	281	0.18		5.5	32.4	-26.9	5.9	NAF
	EB1206683051	31537	2009_40	162.6	164.0	1.4	Raw Coal (AL5)	6.8	664	0.12		3.7	34.8	-31.1	9.5	NAF
	EB1206683052	31536	2009_40	164.5	165.6	1.1	Raw Coal (AL4)	5.9	364	0.15	0.025	0.8	8.4	-7.6	11.0	NAF (Barren)
	EB1206683053	31535	2009_40	165.6	168.6	3.0	Raw Coal (AL4-AL3)	6.1	302	0.15		4.6	175.0	-170.4	38.1	NAF
	EB1206683054	31534	2009_40	168.6	171.6	3.0	Raw Coal (AL3-AL2)	6.0	258	0.20		6.1	176.0	-169.9	28.7	NAF
	EB1206683055	31533	2009_40	171.6	174.5	2.9	Raw Coal (AL2-AL1)	6.0	294	0.33	0.019	0.6	6.2	-5.6	10.7	NAF (Barren)
	EB1206683056	31532	2009_40	175.0	176.6	1.6	Raw Coal (B3)	6.9	579	0.24		7.4	55.2	-47.9	7.5	NAF
	EB1206683057	31531	2009_40	176.6	179.6	3.0	Raw Coal (B3-B2)	6.7	399	0.18	0.01	0.3	8.2	-7.9	26.8	NAF (Barren)
	EB1206683058	31530	2009_40	179.6	182.2	2.6	Raw Coal (B2)	6.2	308	0.23	0.007	0.2	7.1	-6.9	33.1	NAF (Barren)
	EB1206683059	31529	2009_40	182.2	184.0	1.8	Raw Coal (B1)	5.6	404	0.28	0.02	0.6	8.5	-7.9	13.9	NAF (Barren)
	EB1206683060	31528	2009_40	198.0	199.4	1.4	Raw Coal (C3)	6.1	232	0.24	0.023	0.7	6.2	-5.5	8.8	NAF (Barren)
	EB1206683061	31527	2009_40	201.9	202.4	0.5	Raw Coal (C2)	5.9	273	0.23	0.003	0.1	8.2	-8.1	107.1	NAF (Barren)
	EB1206683062	31526	2009_40	228.2	229.8	1.6	Raw Coal (D1)	5.8	341	0.19	0.028	0.9	8.4	-7.5	9.8	NAF (Barren)
	EB1206683063	31525	2009_40	237.6	239.4	1.8	Raw Coal (E2-E1)	5.5	320	0.24	0.085	2.6	8.0	-5.4	3.1	NAF (Barren)
	EB1206683064	31524	2009_40	248.1	249.4	1.3	Raw Coal (F)	5.4	379	0.31	0.136	4.2	6.3	-2.1	1.5	Uncertain
COAL REJECTS																
7	EB1206683065	31757	2009_03	226.9	231.6	4.7	Coarse Reject (AU3-AU1)	7.0	1290	0.18	-	5.5	50.4	-44.9	9.1	NAF
	EB1206683066	31758	2009_03	232.0	232.4	0.4	Coarse Reject (AU1)	7.2	761	0.10	-	3.1	63.1	-60.0	20.6	NAF (Barren)
	EB1206683067	31759 - 31762	2009_03	Composite			Coarse Reject (AL5-AL1)	7.5	923	0.11	-	3.4	52.8	-49.4	15.7	NAF
	EB1206683068	31763	2009_03	244.4	246.5	2.1	Coarse Reject (B3)	7.3	997	0.16	-	4.9	37.8	-32.9	7.7	NAF
	EB1206683069	31765 - 31767	2009_03	Composite			Coarse Reject (B2-B1,C5)	7.4	1130	0.05	-	1.5	55.8	-54.3	36.4	NAF (Barren)
	EB1206683070	31770	2009_03	295.3	298.4	3.1	Coarse Reject (D2-D1)	7.0	960	0.02	-	0.6	9.0	-8.4	14.7	NAF (Barren)
	EB1206683071	31771	2009_03	305.7	307.5	1.8	Coarse Reject (E2-E1)	3.0	3340	3.35	3.35	102.6	0.3	108.5	0.0	PAF

Table B8: Coal Reject and Raw Coal Samples Selected for Additional Geochemical (Multi-Element) Tests

RGS ME No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Material Description & Seam Code	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth			(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
8	EB1206683072	31505 - 31511	2009_08	Composite			Coarse Reject (AU4-AU1, AL5-AL1)	5.9	670	0.11	-	3.4	8.4	-5.0	2.5	NAF
	EB1206683073	31502 - 31504	2009_08	Composite			Coarse Reject (AL1, B3-B1)	6.7	1200	0.07	-	2.1	36.6	-34.5	17.1	NAF (Barren)
	EB1206683074	31501	2009_08	121.5	122.9	1.4	Coarse Reject (C5)	5.9	936	0.10	-	3.1	15.8	-12.7	5.2	NAF (Barren)
	EB1206683075	31950	2009_08	157.2	159.2	2.0	Coarse Reject (C1)	6.6	831	0.16	-	4.9	18.3	-13.4	3.7	NAF
	EB1206683076	31946, 31947	2009_08	Composite			Coarse Reject (D2-D1)	6.2	1160	0.28	0.201	6.2	17.0	-10.8	2.8	NAF
	EB1206683077	31944	2009_08	187.2	189.2	2.0	Coarse Reject (F)	5.3	1080	0.29	0.359	11.0	13.0	-2.0	1.2	Uncertain
	EB1206683078	31943	2009_08	201.0	202.8	1.8	Coarse Reject (G)	4.9	837	0.10	-	3.1	2.8	0.3	0.9	NAF (Barren)
9	EB1206683079	31772 - 31776	2009_22	Composite			Coarse Reject (AU2-AU1, AL6-AL1)	6.9	1300	0.12	-	3.7	51.0	-47.3	13.9	NAF
	EB1206683080	31777	2009_22	155.0	157.3	2.3	Coarse Reject (B3)	7.1	1040	0.09	-	2.8	37.2	-34.4	13.5	NAF (Barren)
	EB1206683081	31778 - 31780	2009_22	Composite			Coarse Reject (B2)	6.8	1330	0.05	-	1.5	68.5	-67.0	44.7	NAF (Barren)
	EB1206683082	31781	2009_22	161.7	163.0	1.3	Coarse Reject (B1)	6.9	1310	0.06	-	1.8	20.9	-19.1	11.4	NAF (Barren)
	EB1206683083	31782	2009_22	166.5	168.4	1.9	Coarse Reject (C5)	6.1	1800	0.11	-	3.4	33.0	-29.6	9.8	NAF
	EB1206683084	31786	2009_22	226.2	228.2	2.0	Coarse Reject (E2-E1)	5.1	945	0.03	-	0.9	4.4	-3.5	4.8	NAF (Barren)
	EB1206683085	31787	2009_22	234.9	236.7	1.8	Coarse Reject (F)	5.3	951	0.02	-	0.6	32.4	-31.8	52.9	NAF (Barren)
10	EB1206683086	31788	2009_22	247.7	249.2	1.5	Coarse Reject (G)	4.7	1100	0.07	-	2.1	3.2	-1.1	1.5	NAF (Barren)
	EB1206683087	31942	2009_34	118.7	120.3	1.6	Coarse Reject (F)	3.6	1900	1.03	-	31.5	0.3	31.3	0.0	PAF
11	EB1206683088	31538 - 31541	2009_40	Composite			Coarse Reject (AU4-AU2)	6.1	647	0.06	-	1.8	32.4	-30.6	17.6	NAF (Barren)
	EB1206683089	31537	2009_40	162.6	164.0	1.4	Coarse Reject (AL5)	7.1	806	0.04	-	1.2	32.4	-31.2	26.4	NAF (Barren)
	EB1206683090	31532 - 31536	2009_40	Composite			Coarse Reject (AL4-AL1, B3)	6.9	1000	0.16	-	4.9	47.4	-42.5	9.7	NAF
	EB1206683091	31531	2009_40	176.6	179.6	3.0	Coarse Reject (B3-B2)	7.2	733	0.07	-	2.1	37.2	-35.1	17.4	NAF (Barren)
	EB1206683092	31529, 31530	2009_40	Composite			Coarse Reject (B2-B1)	5.8	900	0.08	-	2.5	48.6	-46.2	19.8	NAF (Barren)
	EB1206683093	31527, 31528	2009_40	Composite			Coarse Reject (C3-C2)	6.0	1060	0.09	-	2.8	17.7	-14.9	6.4	NAF (Barren)
	EB1206683094	31526	2009_40	228.2	229.8	1.6	Coarse Reject (D1)	6.8	595	0.14	-	4.3	16.2	-11.9	3.8	NAF
	EB1206683095	31525	2009_40	237.6	239.4	1.8	Coarse Reject (E2-E1)	4.7	654	0.10	-	3.1	4.7	-1.6	1.5	NAF (Barren)
	EB1206683096	31524	2009_40	248.1	249.4	1.3	Coarse Reject (F)	5.4	820	1.25	1.26	38.6	60.1	-21.5	1.6	Uncertain
	EB1206683099	31527, 31528	2009_40	Composite			Fine Reject (C3-C2)	5.1	466	0.26	0.07	2.14	5.9	-3.8	2.8	NAF (Barren)

Notes

1. Current pH, EC, Alkalinity and Acidity provided for 1:5 sample:water extracts
2. Scr = Chromium Reducible Sulfur; MPA = Maximum Potential Acidity; ANC = Acid Neutralising Capacity; and NAPP = Net Acid Producing Potential.
3. Sample classification criteria provided in report text. NAF = Non-Acid Forming. PAF = Potentially Acid Forming.

Table B9: Multi-Element Test Results for Selected Coal Reject and Raw Coal Materials

	Sample Type →		RAW COAL					
	RGS Sample Number →		1	2	3	4	5	6
	ALS Laboratory ID →		EB1219958100	EB1219958101	EB1219958102	EB1219958103	EB1219958104	EB1219958105
	Material Description →							
Parameters	Detection Limit	NEPC ¹ Health-Based Investigation Level (HILs)-C	Raw Coal (A/B) - drill hole 2009_03	Raw Coal (C/D/E) - drill hole 2009_03	Raw Coal (A/B/D) - drill hole 2009_08	Raw Coal (A to G) - drill hole 2009_22	Raw Coal (D/E) - drill hole 2009_34	Raw Coal (A to F) - drill hole 2009_40
Major Elements	All units mg/kg							
Aluminium (Al)	50	-	2,380	3,300	1,710	1,970	860	1,630
Calcium (Ca)	50	-	7,760	2,300	2,980	4,280	1,090	3,180
Iron (Fe)	50	-	8,690	8,340	8,560	5,560	2,110	11,200
Magnesium (Mg)	50	-	700	570	640	570	440	700
Phosphorus (P)	50	-	120	80	140	70	<50	120
Potassium (K)	50	-	150	290	100	90	80	160
Sodium (Na)	50	-	520	540	250	350	160	240
Minor Elements	All units mg/kg							
Antimony (Sb)	5	-	<5	<5	<5	<5	<5	<5
Arsenic (As)	5	300	<5	5	<5	<5	<5	<5
Boron (B)	50	20,000	<50	<50	<50	<50	<50	<50
Cadmium (Cd)	1	90	<1	<1	<1	<1	<1	<1
Chromium (Cr) - hexavalent	2	300 **	3	4	4	3	6	4
Cobalt (Co)	2	300	3	11	3	5	7	4
Copper (Cu)	5	17,000	18	34	13	19	12	18
Lead (Pb)	5	600	10	13	9	12	8	12
Manganese (Mn)	5	19,000	286	207	297	203	10	280
Molybdenum (Mo)	2	-	<2	<2	<2	<2	<2	<2
Nickel (Ni)	2	1,200	<2	8	2	4	8	5
Selenium (Se)	5	700	<5	<5	<5	<5	<5	<5
Thorium (Th)	0.1	-	4	4.8	4.3	4.6	3.3	5.2
Uranium (U)	0.1	-	0.8	0.7	0.8	0.8	0.7	0.9
Vanadium (V)	5	-	37	36	35	32	26	35
Zinc (Zn)	5	30,000	29	40	24	18	13	26
Exchangable Cations	All units meq/100g (except Exchangable Sodium Percentage (%))							
Exch. Calcium	0.1	-	-	-	-	-	-	-
Exch. Magnesium	0.1	-	-	-	-	-	-	-
Exch. Potassium	0.1	-	-	-	-	-	-	-
Exch. Sodium	0.1	-	-	-	-	-	-	-
Cation Exchange Capacity	0.1	-	-	-	-	-	-	-
Calcium:Magnesium Ratio	-	-	-	-	-	-	-	-
Exchangable Sodium Percentage	0.1%	-	-	-	-	-	-	-

Notes: < indicates less than the laboratory limit of reporting. Shaded cells exceed applied guideline limit.

** Guideline level for Cr(VI) = 300 mg/kg. Guideline level for Cr(III) = 24% of total Cr.

1. NEPC (2013). National Environmental Protection Council (NEPC). *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*, Amendment of Schedule B1-B7 of 1999 version. *Guideline on Investigation Levels for Soil and Groundwater. Health-Based Investigation Level - HIL(C); recreational open public spaces*.

Table B9: Multi-Element Test Results for Selected Coal Reject and Raw Coal Materials

	Sample Type →		COAL REJECT				
	RGS Sample Number →		7	8	9	10	11
	ALS Laboratory ID →		EB1219958106	EB1219958107	EB1219958108	EB1219958109	EB1219958110
	Material Description →						
Parameters	Detection Limit	NEPC ¹ Health-Based Investigation Level (HILs)-C	Coal Reject (A/B/D/E) composite: 2009_03	Coal Reject (A to G exc. E) composite: 2009_08	Coal Reject (A to G exc. D) composite: 2009_22	Coal Reject (F): 2009_34	Coal Reject (A to F) composite: 2009_40
Major Elements	All units mg/kg						
Aluminium (Al)	50	-	5,360	4,890	5,220	4,330	3,770
Calcium (Ca)	50	-	11,600	3,240	6,740	680	3,330
Iron (Fe)	50	-	21,600	21,100	21,100	12,000	42,700
Magnesium (Mg)	50	-	1,190	860	980	260	1,180
Phosphorus (P)	50	-	270	190	190	100	180
Potassium (K)	50	-	390	340	270	370	350
Sodium (Na)	50	-	560	350	360	140	220
Minor Elements	All units mg/kg						
Antimony (Sb)	5	-	<5	<5	<5	<5	<5
Arsenic (As)	5	300	12	<5	<5	18	7
Boron (B)	50	20,000	<50	<50	<50	<50	<50
Cadmium (Cd)	1	90	<1	<1	<1	<1	<1
Chromium (Cr) - hexavalent	2	300 **	6	5	3	4	4
Cobalt (Co)	2	300	4	4	4	15	4
Copper (Cu)	5	17,000	33	43	59	34	28
Lead (Pb)	5	600	19	15	20	18	20
Manganese (Mn)	5	19,000	532	727	1,300	78	907
Molybdenum (Mo)	2	-	<2	<2	<2	<2	<2
Nickel (Ni)	2	1,200	4	4	3	24	6
Selenium (Se)	5	700	<5	<5	<5	<5	<5
Thorium (Th)	0.1	-	8	7.5	9.2	8.7	9.4
Uranium (U)	0.1	-	0.9	0.9	1.1	1.6	1.1
Vanadium (V)	5	-	19	24	23	20	23
Zinc (Zn)	5	30,000	51	30	34	13	56
Exchangable Cations	All units meq/100g (except Exchangable Sodium Percentage (%))						
Exch. Calcium	0.1	-	-	-	-	-	-
Exch. Magnesium	0.1	-	-	-	-	-	-
Exch. Potassium	0.1	-	-	-	-	-	-
Exch. Sodium	0.1	-	-	-	-	-	-
Cation Exchange Capacity	0.1	-	-	-	-	-	-
Calcium:Magnesium Ratio	-	-	-	-	-	-	-
Exchangable Sodium Percentage	0.1%	-	-	-	-	-	-

Notes: < indicates less than the laboratory limit of reporting. Shaded cells exceed applied guideline limit.

** Guideline level for Cr(VI) = 300 mg/kg. Guideline level for Cr(III) = 24% of total Cr.

1. NEPC (2013). National Environmental Protection Council (NEPC). *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*, Amendment of Schedule B1-B7 of 1999 version. *Guideline on Investigation Levels for Soil and Groundwater. Health-Based Investigation Level - HIL(C); recreational open public spaces*.

Table B10: Geochemical Abundance Index Results for Selected Coal Reject and Raw Coal Materials

	Sample Type →		RAW COAL					
	RGS Sample Number →		1	2	3	4	5	6
	ALS Laboratory ID →		EB1219958100	EB1219958101	EB1219958102	EB1219958103	EB1219958104	EB1219958105
	Material Description →		Raw Coal (A/B) - drill hole 2009_03	Raw Coal (C/D/E) - drill hole 2009_03	Raw Coal (A/B/D) - drill hole 2009_08	Raw Coal (A to G) - drill hole 2009_22	Raw Coal (D/E) - drill hole 2009_34	Raw Coal (A to F) - drill hole 2009_40
Parameters	Detection Limit	Average Crustal Abundance ¹						
Major Elements	all units in mg/kg		Geochemical Abundance Index					
Aluminium (Al)	50	71,000	0	0	0	0	0	0
Calcium (Ca)	50	15,000	0	0	0	0	0	0
Iron (Fe)	50	40,000	0	0	0	0	0	0
Magnesium (Mg)	50	5,000	0	0	0	0	0	0
Phosphorus (P)	50	800	0	0	0	0	0	0
Potassium (K)	50	14,000	0	0	0	0	0	0
Sodium (Na)	50	5,000	0	0	0	0	0	0
Minor Elements	all units in mg/kg		Geochemical Abundance Index					
Antimony (Sb)	5	5	0	0	0	0	0	0
Arsenic (As)	5	6	0	0	0	0	0	0
Boron (B)	50	100	0	0	0	0	0	0
Cadmium (Cd)	1	0.35	0	0	0	0	0	0
Chromium (Cr)	2	70	0	0	0	0	0	0
Cobalt (Co)	2	8	0	0	0	0	0	0
Copper (Cu)	5	30	0	0	0	0	0	0
Lead (Pb)	5	35	0	0	0	0	0	0
Manganese (Mn)	5	1,000	0	0	0	0	0	0
Molybdenum (Mo)	2	2	0	0	0	0	0	0
Nickel (Ni)	2	50	0	0	0	0	0	0
Selenium (Se)	5	0.4	2	2	2	2	2	2
Thorium (Th)	0.1	9	0	0	0	0	0	0
Uranium (U)	0.1	2	0	0	0	0	0	0
Vanadium (V)	5	9	1	1	1	1	1	1
Zinc (Zn)	5	90	0	0	0	0	0	0

Notes:

GAI's greater than or equal to 3 are highlighted.

1. Average Crustal Abundance values sourced from the "GARD Guide", Chapter 5 (INAP, 2009).

1. When no GARD Guide value is available for particular element, then values are taken from Bowen H.J.M.(1979) Environmental Chemistry of the Elements, Academic Press, New York, p42-43.

Table B10: Geochemical Abundance Index Results for Selected Coal Reject and Raw Coal Materials

	Sample Type →		COAL REJECT				
	RGS Sample Number →		7	8	9	10	11
	ALS Laboratory ID →		EB1219958106	EB1219958107	EB1219958108	EB1219958109	EB1219958110
	Material Description →						
Parameters	Detection Limit	Average Crustal Abundance ¹	Coal Reject (A/B/D/E) composite: 2009_03	Coal Reject (A to G exc. E) composite: 2009_08	Coal Reject (A to G exc. D) composite: 2009_22	Coal Reject (F): 2009_34	Coal Reject (A to F) composite: 2009_40
Major Elements	all units in mg/kg		Geochemical Abundance Index				
Aluminium (Al)	50	71,000	0	0	0	0	0
Calcium (Ca)	50	15,000	0	0	0	0	0
Iron (Fe)	50	40,000	0	0	0	0	0
Magnesium (Mg)	50	5,000	0	0	0	0	0
Phosphorus (P)	50	800	0	0	0	0	0
Potassium (K)	50	14,000	0	0	0	0	0
Sodium (Na)	50	5,000	0	0	0	0	0
Minor Elements	all units in mg/kg		Geochemical Abundance Index				
Antimony (Sb)	5	5	0	0	0	0	0
Arsenic (As)	5	6	0	0	0	1	0
Boron (B)	50	100	0	0	0	0	0
Cadmium (Cd)	1	0.35	0	0	0	0	0
Chromium (Cr)	2	70	0	0	0	0	0
Cobalt (Co)	2	8	0	0	0	0	0
Copper (Cu)	5	30	0	0	0	0	0
Lead (Pb)	5	35	0	0	0	0	0
Manganese (Mn)	5	1,000	0	0	0	0	0
Molybdenum (Mo)	2	2	0	0	0	0	0
Nickel (Ni)	2	50	0	0	0	0	0
Selenium (Se)	5	0.4	2	2	2	2	2
Thorium (Th)	0.1	9	0	0	0	0	0
Uranium (U)	0.1	2	0	0	0	0	0
Vanadium (V)	5	9	0	1	1	1	1
Zinc (Zn)	5	90	0	0	0	0	0

Notes:

GAI's greater than or equal to 3 are highlighted.

1. Average Crustal Abundance values sourced from the "GARD Guide", Chapter 5 (INAP, 2009).

1. When no GARD Guide value is available for particular element, then values are taken from Bowen H.J.M.(1979) Environmental Chemistry of the Elements, Academic Press, New York, p42-43.

Table B11: Multi-Element Test Results for Water Extracts from Coal Reject and Raw Coal Samples

		Sample Type →		RAW COAL					
		RGS Sample Number →		1	2	3	4	5	6
		ALS Laboratory ID →		EB1219958100	EB1219958101	EB1219958102	EB1219958103	EB1219958104	EB1219958105
		Material Description →		Raw Coal (A/B) - drill hole 2009_03	Raw Coal (C/D/E) - drill hole 2009_03	Raw Coal (A/B/D) - drill hole 2009_08	Raw Coal (A to G) - drill hole 2009_22	Raw Coal (D/E) - drill hole 2009_34	Raw Coal (A to F) - drill hole 2009_40
		Water Quality Guidelines:							
Parameters	Detection Limit	Aquatic Ecosystems (freshwater) ¹	Livestock Drinking Water ²						
pH	0.1 pH unit	6 to 9	-	7.0	5.2	6.2	6.5	5.2	5.9
Electrical Conductivity	1 µS/cm	<1,000 [#]	3,580 [^]	574	495	325	425	276	347
Total Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	166	14	60	140	12	64
Bicarbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	166	14	60	140	12	64
Carbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Major Ions	All element concentrations in mg/L								
Calcium (Ca)	2	-	1,000	46	8	22	42	8	20
Magnesium (Mg)	2	-	-	6	<2	6	8	6	6
Potassium (K)	2	-	-	2	2	<2	<2	2	4
Sodium (Na)	2	-	-	40	42	22	30	20	20
Chloride (Cl)	2	-	-	<2	2	2	2	6	8
Phosphate (PO ₄)	2	-	-	<2	<2	<2	<2	<2	<2
Sulfate (SO ₄)	2	-	1,000	32	88	28	18	56	24
Metals	All element concentrations in mg/L								
Aluminium (Al)	0.2	0.055	5	<0.2	<0.2	<0.2	<0.2	0.6	<0.2
Antimony (Sb)	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic (As) - pentavalent	0.02	0.013 **	0.5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron (B)	0.2	0.37	5	0.4	0.4	0.6	0.4	0.8	0.4
Cadmium (Cd)	0.02	0.0002	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chromium (Cr) - total or (VI)*	0.02	0.001 * (hex)	1 (total)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cobalt (Co)	0.02	-	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper (Cu)	0.02	0.0014	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron (Fe)	0.2	-	-	<0.2	<0.2	<0.2	<0.2	0.2	<0.2
Lead (Pb)	0.02	0.0034	0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Manganese (Mn)	0.02	1.9	-	0.06	0.08	0.04	0.10	0.08	0.04
Molybdenum (Mo)	0.02	-	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel (Ni)	0.02	0.011	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Selenium (Se)	0.02	0.011	0.02	0.02	0.04	0.02	0.04	0.04	0.02
Thorium (Th)	0.002	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium (U)	0.002	-	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Vanadium (V)	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc (Zn)	0.02	0.008	20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

* Cr (VI) = hexavalent

** 0.024 mg/L for trivalent Arsenic (III)

[#] for still water bodies only, moving rivers at low flow rates should not exceed 2200µS/cm[^] calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water.

Notes: < Indicates concentration less than the detection limit. Shaded cells indicate values which exceed applied guideline values.

1. ANZECC & ARMCANZ (2000). Trigger values for aquatic ecosystems (95% species protection)

2. ANZECC & ARMCANZ (2000). Recommended guideline limits for Livestock Drinking Water.

1 + 2. both taken from the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality", National Water Quality Management Strategy, 2000, compilation by ANZECC and ARMCANZ

Table B11: Multi-Element Test Results for Water Extracts from Coal Reject and Raw Coal Samples

		Sample Type →		COAL REJECT				
		RGS Sample Number →		7	8	9	10	11
		ALS Laboratory ID →		EB1219958106	EB1219958107	EB1219958108	EB1219958109	EB1219958110
		Material Description →		Coal Reject (A/B/D/E) composite: 2009_03	Coal Reject (A to G exc. E) composite: 2009_08	Coal Reject (A to G exc. D) composite: 2009_22	Coal Reject (F): 2009_34	Coal Reject (A to F) composite: 2009_40
		Water Quality Guidelines:						
Parameters	Detection Limit	Aquatic Ecosystems (freshwater) ¹	Livestock Drinking Water ²					
pH	0.1 pH unit	6 to 9	-	3.8	5.5	5.4	3.6	5.5
Electrical Conductivity	1 µS/cm	<1,000 [#]	3,580 [^]	1,343	959	1,222	1,900	768
Total Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	156	31	102	<0.2	47
Bicarbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	156	31	102	<0.2	47
Carbonate Alkalinity (mgCaCO ₃ /L)	0.2 mg/L	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
Major Ions				All element concentrations in mg/L				
Calcium (Ca)	2	-	1,000	116	40	78	24	46
Magnesium (Mg)	2	-	-	14	8	14	10	12
Potassium (K)	2	-	-	6	4	4	<2	8
Sodium (Na)	2	-	-	60	40	44	6	24
Chloride (Cl)	2	-	-	66	88	156	48	72
Phosphate (PO ₄)	2	-	-	<2	<2	<2	<2	<2
Sulfate (SO ₄)	2	-	1,000	194	66	44	376	60
Metals				All element concentrations in mg/L				
Aluminium (Al)	0.2	0.055	5	<0.2	<0.2	<0.2	5.8	<0.2
Antimony (Sb)	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic (As) - pentavalent	0.02	0.013 **	0.5	<0.02	<0.02	<0.02	<0.02	<0.02
Boron (B)	0.2	0.37	5	<0.2	0.2	<0.2	<0.2	0.2
Cadmium (Cd)	0.02	0.0002	0.01	<0.02	<0.02	<0.02	<0.02	<0.02
Chromium (Cr) - total or (VI)*	0.02	0.001 * (hex)	1 (total)	<0.02	<0.02	<0.02	<0.02	<0.02
Cobalt (Co)	0.02	-	1	<0.02	<0.02	<0.02	0.42	<0.02
Copper (Cu)	0.02	0.0014	1	<0.02	<0.02	<0.02	0.12	<0.02
Iron (Fe)	0.2	-	-	<0.2	<0.2	<0.2	11.6	<0.2
Lead (Pb)	0.02	0.0034	0.1	<0.02	<0.02	<0.02	<0.02	<0.02
Manganese (Mn)	0.02	1.9	-	0.28	0.20	0.26	1.78	0.08
Molybdenum (Mo)	0.02	-	0.15	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel (Ni)	0.02	0.011	1	<0.02	<0.02	<0.02	0.56	<0.02
Selenium (Se)	0.02	0.011	0.02	0.04	0.04	0.04	0.02	0.04
Thorium (Th)	0.002	-	-	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium (U)	0.002	-	0.2	<0.02	<0.02	<0.02	<0.02	<0.02
Vanadium (V)	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc (Zn)	0.02	0.008	20	<0.02	<0.02	<0.02	0.32	<0.02

* Cr (VI) = hexavalent

** 0.024 mg/L for trivalent Arsenic (III)

[#] for still water bodies only, moving rivers at low flow rates should not exceed 2200µS/cm[^] calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water.

Notes: < Indicates concentration less than the detection limit. Shaded cells indicate values which exceed applied guideline values.

1. ANZECC & ARMCANZ (2000). Trigger values for aquatic ecosystems (95% species protection)

2. ANZECC & ARMCANZ (2000). Recommended guideline limits for Livestock Drinking Water.

1 + 2. both taken from the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality", National Water Quality Management Strategy, 2000, compilation by ANZECC and ARMCANZ

Table B-12: Coal Reject and Raw Coal Samples Selected for Kinetic Leach Column (KLC) Tests

RGS KLC No.	ALS Laboratory Number	Client Sample ID	Drill Hole No.	Sample Interval (m)			Sample Type	Material Description & Seam Code	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
				From	To	Depth				(µS/cm)	(%)	(kg H ₂ SO ₄ /t)					
RAW COAL																	
1	EB1206683001	31757	2009_03	226.9	231.6	4.7	Drill Core	Raw Coal (AU3-AU1)	6.8	824	0.28		8.6	21.6	-13.0	2.5	NAF
	EB1206683002	31759	2009_03	232.7	234.3	1.6	Drill Core	Raw Coal (AL5)	7.0	542	0.18		5.5	22.0	-16.5	4.0	NAF
	EB1206683003	31760	2009_03	234.8	237.3	2.5	Drill Core	Raw Coal (AL4)	7.0	556	0.12		3.7	37.8	-34.1	10.3	NAF
	EB1206683004	31761	2009_03	237.7	240.8	3.1	Drill Core	Raw Coal (AL3-AL2)	7.0	557	0.16		4.9	39.6	-34.7	8.1	NAF
	EB1206683005	31762	2009_03	241.7	243.9	2.2	Drill Core	Raw Coal (AL1)	7.0	433	0.22		6.7	30.6	-23.9	4.5	NAF
2	EB1206683006	31763	2009_03	244.4	246.5	2.1	Drill Core	Raw Coal (B3)	7.2	610	0.17		5.2	30.0	-24.8	5.8	NAF
	EB1206683007	31765	2009_03	248.3	250.0	1.7	Drill Core	Raw Coal (B2)	7.2	591	0.13		4.0	36.0	-32.0	9.0	NAF
	EB1206683008	31766	2009_03	250.7	251.5	0.8	Drill Core	Raw Coal (B1)	7.1	480	0.14		4.3	31.8	-27.5	7.4	NAF
	EB1206683011	31769	2009_03	281.5	282.0	0.5	Drill Core	Raw Coal (C2)	6.8	310	0.26		8.0	16.8	-8.8	2.1	NAF
	EB1206683013	31771	2009_03	305.7	307.5	1.8	Drill Core	Raw Coal (E2-E1)	4.5	1030	0.90	0.734	22.5	3.7	18.8	0.2	PAF
COARSE REJECTS (>5 mm)																	
3	EB1206683065	31757	2009_03	226.9	231.6	4.7	Reject	Coarse Reject (AU3-AU1)	7.0	1290	0.18		5.5	50.4	-44.9	9.1	NAF
	EB1206683066	31758	2009_03	232.0	232.4	0.4	Reject	Coarse Reject (AU1)	7.2	761	0.10		3.1	63.1	-60.0	20.6	NAF (Barren)
	EB1206683067	31759 - 31762	2009_03	Composite			Reject	Coarse Reject (AL5-AL1)	7.5	923	0.11		3.4	52.8	-49.4	15.7	NAF
	EB1206683068	31763	2009_03	244.4	246.5	2.1	Reject	Coarse Reject (B3)	7.3	997	0.16		4.9	37.8	-32.9	7.7	NAF
	EB1206683069	31765 - 31767	2009_03	Composite			Reject	Coarse Reject (B2-B1,C5)	7.4	1130	0.05		1.5	55.8	-54.3	36.4	NAF (Barren)
	EB1206683070	31770	2009_03	295.3	298.4	3.1	Reject	Coarse Reject (D2-D1)	7.0	960	0.02		0.6	9.0	-8.4	14.7	NAF (Barren)
	EB1206683071	31771	2009_03	305.7	307.5	1.8	Reject	Coarse Reject (E2-E1)	3.0	3340	3.35	3.35	102.6	0.25	108.5	0.002	PAF
4	EB1206683088	31538 - 31541	2009_40	Composite			Reject	Coarse Reject (AU4-AU2)	6.1	647	0.06		1.8	32.4	-30.6	17.6	NAF (Barren)
	EB1206683089	31537	2009_40	162.6	164.0	1.4	Reject	Coarse Reject (AL5)	7.1	806	0.04		1.2	32.4	-31.2	26.4	NAF (Barren)
	EB1206683091	31531	2009_40	176.6	179.6	3.0	Reject	Coarse Reject (B3-B2)	7.2	733	0.07		2.1	37.2	-35.1	17.4	NAF (Barren)
	EB1206683092	31529, 31530	2009_40	Composite			Reject	Coarse Reject (B2-B1)	5.8	900	0.08		2.5	48.6	-46.2	19.8	NAF (Barren)
	EB1206683094	31526	2009_40	228.2	229.8	1.6	Reject	Coarse Reject (D1)	6.8	595	0.14		4.3	16.2	-11.9	3.8	NAF
	EB1206683095	31525	2009_40	237.6	239.4	1.8	Reject	Coarse Reject (E2-E1)	4.7	654	0.10		3.1	4.7	-1.6	1.5	NAF (Barren)

Notes:

1. Current pH, EC, Alkalinity and Acidity provided for 1:5 sample:water extracts
2. Scr = Chromium Reducible Sulfur; MPA = Maximum Potential Acidity; ANC = Acid Neutralising Capacity; and NAPP = Net Acid Producing Potential.
3. Sample classification detail provided in report text.

Table B13: Acid Base Account Results for Feed Coal and Coal Ash Materials

ALS Laboratory Sample ID	Client Sample ID	Sample Source	Material Description	pH ¹	EC ¹	Total S	Scr	MPA ²	ANC ²	NAPP ²	ANC: MPA Ratio	Sample Classification ³
					(μS/cm)	(%)		(kg H ₂ SO ₄ /t)				
FEED COAL AND COAL ASH												
EB1206683097	Sample 1	Coal Quality Lab	Composite Feed Coal Sample	8.1	142	0.18	0.010	0.31	19.5	-19.2	64	NAF (Barren)
EB1206683098	-	Coal Quality Lab	Combusted Coal Ash Sample	10.6	1,333	0.26	0.003	0.09	26.4	-26.3	287	NAF (Barren)

Notes

1. Current pH and EC provided for 1:5 sample:water extracts
2. Scr = Chromium Reducible Sulfur; MPA = Maximum Potential Acidity; ANC = Acid Neutralising Capacity; and NAPP = Net Acid Producing Potential.
3. Sample classification criteria provided in report text. NAF = Non-Acid Forming. PAF = Potentially Acid Forming.

Table B14: Multi-Element and Geochemical Abundance Index Results for Coal Ash Material

		ME solid results		GAI results	
		NEPC ¹ Health-Based Investigation Level (HILs)-C	EB1326929-001 Coal Ash	Average Crustal Abundance ²	Geochemical Abundance Index (GAI) ³ Coal Ash
Analyte	LOR				
Major Elements		all units in mg/kg		all units in mg/kg	GAI
Aluminium (Al)	50	-	34,200	71,000	0
Calcium (Ca)	50	-	18,800	15,000	0
Iron (Fe)	50	-	14,900	40,000	0
Magnesium (Mg)	50	-	2,310	5,000	0
Potassium (K)	50	-	870	14,000	0
Sodium (Na)	50	-	460	5,000	0
Nutrients		all units in mg/kg		all units in mg/kg	GAI
Ammonia as N	20	-	<20	-	-
Nitrate (NO ₃) **	0.1	-	0.222	-	-
Nitrite (NO ₂) **	0.1	-	0.329	-	-
Nitrate + Nitrite as N (NOX) **	0.1	-	<0.1	-	-
Total Kjeldahl Nitrogen (TKN)	20	-	<20	-	-
Total Nitrogen as N (TKN + NOX)	20	-	<20	470	0
Total Cyanide - (free form)	1	240 [®]	<1	-	-
Total Phosphorus as P	50	-	107	800	0
Total Organic Carbon (TOC)	200	-	700	29,400	0
Minor Elements		all units in mg/kg		all units in mg/kg	GAI
Antimony (Sb)	5	-	<5	5	0
Arsenic (As)	5	300	<5	6	0
Barium (Ba)	10	-	70	500	0
Beryllium (Be)	1	90	4	6	0
Boron (B)	50	20,000	<50	100	0
Cadmium (Cd)	1	90	<1	0.35	0
Chromium (Cr - total)	2	- [#]	7	70	0
Cobalt (Co)	2	300	4	8	0
Copper (Cu)	5	17,000	25	30	0
Lead (Pb)	5	600	9	35	0
Manganese (Mn)	5	19,000	328	1,000	0
Mercury (Hg) - inorganic	0.1	80	<0.1	0.06	0
Molybdenum (Mo)	2	-	6	2	1
Nickel (Ni)	2	1,200	14	50	0
Selenium (Se)	5	700	<5	0.4	0
Silver (Ag)	2	-	<2	0.057	0
Thallium (Tl)	5	-	<5	0.95	0
Thorium (Th)	0.1	-	8.5	9	0
Tin (Sn - inorganic)	5	-	<5	4	0
Titanium (Ti)	10	-	560	3,800	0
Uranium (U)	0.1	-	1.2	2	0
Vanadium (V)	5	-	77	9	3
Zinc (Zn)	5	30,000	32	90	0

Notes: LOR = limit of reporting (all units in mg/kg)

1. NEPC (2013). National Environmental Protection Council (NEPC). *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)*, Amendment of Schedule B1-B7 of 1999 version. *Guideline on Investigation Levels for Soil and Groundwater. Health-Based Investigation Level - HIL(C); recreational public open space areas.*

2. Crustal Abundance values sourced from the "GARD Guide", Chapter 5 (INAP, 2009). Where no GARD Guide value is available for a particular element, then values were taken from Bowen H.J.M.(1979) *Environmental Chemistry of the Elements*, Academic Press, New York, p42-43.

3. GAI's greater than or equal to 3 are highlighted.

[#] valence state dependant. Guideline level for Cr(VI) = 300 mg/kg. Trivalent Cr(III) = 24% of total Cr.

** calculated based on stoichiometric conversion factor:

1 mg/L of Nitrate as N = 4.43 mg/L of Nitrate (NO₃); and 1 mg/L of Nitrite as N = 3.29 mg/L of Nitrite (NO₂)

[®] up to 1,000 mg/kg for complex forms of cyanide.

Table B15: Soluble Multi-Element Results for Bottle Leachate from Coal Ash Material

ALS Sample Number →		EB1326929-001	Guideline Limits / Trigger Values	
Sample Type/Material Description →		Coal Ash	Aquatic Ecosystems (95% species protection) ¹	Livestock Drinking Water ²
Analyte	Units			
Physico-Chemical				
Moisture Content (dried at 103°C)	%			
Total Dissolved Solids @ 180°C	mg/L	1,060	-	2,400
pH (1:5 sample:DI water)	ph units	10.6	6 to 9	-
Electrical Conductivity at 25°C (1:5)	µS/cm	1,330	<1,000*	3,580 [^]
Alkalinity and Acidity				
Bicarbonate Alkalinity as CaCO ₃	mg/L	<0.2	-	-
Carbonate Alkalinity as CaCO ₃		75.6	-	-
Total Alkalinity as CaCO ₃		130.2	-	-
Acidity as CaCO ₃		<0.2	-	-
Net Alkalinity as CaCO ₃		130.2	-	-
Leachable Ions				
Calcium (Ca)	mg/L	136	-	1000
Magnesium (Mg)		<1	-	-
Potassium (K)		<1	-	-
Sodium (Na)		4	-	-
Sulfate (SO ₄)		215	-	1000
Chloride (Cl)		9	-	-
Fluoride (F)		0.9	-	2
Nutrients				
Ammonia as N	mg/L	0.06	0.9	-
Nitrate + Nitrite as N (NOX) **		<0.01	0.16	99.41
Total Kjeldahl Nitrogen (TKN)		<0.1	-	-
Total Nitrogen as N (TKN + NOX)		<0.1	-	-
Total Cyanide		0.013	0.007	-
Total Phosphorus as P		0.02	-	-
Metals and Metalloids				
Aluminium (Al)	mg/L	0.22	0.055	5
Antimony (Sb)		0.003	-	-
Arsenic (As) - pentavalent		0.013	0.013 *	0.5
Barium (Ba)		0.258	-	-
Beryllium (Be)		<0.001	-	-
Boron (B)		0.84	0.37	5
Cadmium (Cd)		<0.0001	0.0002	0.01
Chromium (Cr - total)		0.070	0.001 (Cr-6)	1 (Cr-total)
Cobalt (Co)		<0.001	-	1
Copper (Cu)		0.0030	0.0014	1
Iron (Fe)		<0.05	-	-
Lead (Pb)		0.002	0.0034	0.1
Manganese (Mn)		<0.001	1.9	-
Mercury (Hg) - inorganic		<0.0001	0.0006	0.002
Molybdenum (Mo)		0.148	-	0.15
Nickel (Ni)		<0.001	0.011	1
Selenium (Se)		<0.01	0.011	0.02
Silver (Ag)		<0.001	0.00005	-
Thallium (Tl)		<0.001	-	-
Thorium (Th)		<0.001	-	-
Tin (Sn - inorganic)		<0.001	-	-
Titanium (Ti)		<0.01	-	-
Uranium (U)		<0.001	-	0.2
Vanadium (V)		1.27	-	-
Zinc (Zn)		0.065	0.008	20
Radionuclides (Bq/L)				
Gross Alpha Activity	Bq/L	<0.24	-	0.5
Gross Beta Activity (K ⁴⁰ corrected) #		<0.48	-	0.5

Notes: # (K40 = Potassium40) * 0.024 mg/L for trivalent As (III)

1. ANZECC & ARMCANZ (2000). Trigger values for aquatic ecosystems (95% species protection)

2. ANZECC & ARMCANZ (2000). Recommended guideline limits for Livestock Drinking Water.

** calculated based on conversion factor: 1 mg/L of Nitrate as N = 4.43 mg/L of Nitrate; and 1 mg/L of Nitrite as N = 3.29 mg/L of Nitrite
* for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm[^] calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water.

ATTACHMENT C

ALS Laboratory Data (Certificates of Analysis)

CERTIFICATE OF ANALYSIS

Work Order	: EB1206683	Page	: 1 of 22
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 07-MAR-2012
Sampler	: A. Robertson	Issue Date	: 19-MAR-2012
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 99
		No. of samples analysed	: 99

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Myles.Clark	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Myles.Clark	Acid Sulfate Soils Supervisor	Stafford Minerals - AY
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 22
Work Order : EB1206683
Client : RGS ENVIRONMENTAL PTY LTD
Project : Project Stone

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31757 226.90 - 231.60 [06-MAR-2012]	31759 232.70 - 234.30 [06-MAR-2012]	31760 234.80 - 237.30 [06-MAR-2012]	31761 237.70 - 240.80 [06-MAR-2012]	31762 241.70 - 243.90 [06-MAR-2012]
Client sampling date / time								
Compound	CAS Number	LOR	Unit	EB1206683-001	EB1206683-002	EB1206683-003	EB1206683-004	EB1206683-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.8	7.0	7.0	7.0	7.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	8.6	5.5	3.7	4.9	6.7
Net Acid Production Potential	----	0.5	kg H2SO4/t	-13.0	-16.5	-34.1	-34.7	-23.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	824	542	556	557	433
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	21.6	22.0	37.8	39.6	30.6
ANC as CaCO3	----	0.1	% CaCO3	2.2	2.2	3.8	4.0	3.1
Fizz Rating	----	0	Fizz Unit	1	1	2	2	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.28	0.18	0.12	0.16	0.22



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31763 244.40 - 246.50	31765 248.30 - 250.00	31766 250.70 - 251.50	31767 255.00 - 256.50	31768 277.50 - 278.50
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-006	EB1206683-007	EB1206683-008	EB1206683-009	EB1206683-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.2	7.2	7.1	6.6	6.8
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	5.2	4.0	4.3	4.9	5.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-24.8	-32.0	-27.5	-1.3	-2.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	610	591	480	463	391
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	30.0	36.0	31.8	6.2	8.4
ANC as CaCO3	----	0.1	% CaCO3	3.1	3.7	3.2	0.6	0.8
Fizz Rating	----	0	Fizz Unit	2	2	2	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.17	0.13	0.14	0.16	0.18



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31769 281.50 - 282.00	31770 295.30 - 298.40	31771 305.70 - 307.50	31511 90.5 - 93.50	31510 93.50 - 96.50
				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-011	EB1206683-012	EB1206683-013	EB1206683-014	EB1206683-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.8	7.2	4.5	6.2	6.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	8.0	4.9	27.5	5.5	5.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-8.8	-12.1	23.8	-2.1	<0.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	310	283	1030	323	273
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	16.8	17.0	3.7	7.6	5.9
ANC as CaCO3	----	0.1	% CaCO3	1.7	1.7	0.4	0.8	0.6
Fizz Rating	----	0	Fizz Unit	1	1	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.26	0.16	0.90	0.18	0.18



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31509 96.80 - 98.80	31508 99.10 - 99.80	31507 99.90 - 102.90	31506 103.00 - 106.00	31505 106.00 - 109.40
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-016	EB1206683-017	EB1206683-018	EB1206683-019	EB1206683-020
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.1	5.9	6.1	6.2	6.2
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	5.2	4.3	4.6	7.3	7.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	<0.5	-11.1	-12.4	-28.6	-9.6
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	235	298	285	260	230
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	4.9	15.4	17.0	36.0	17.3
ANC as CaCO3	----	0.1	% CaCO3	0.5	1.6	1.7	3.7	1.8
Fizz Rating	----	0	Fizz Unit	0	1	1	2	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.17	0.14	0.15	0.24	0.25



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31504 109.40 - 112.40 [06-MAR-2012]	31503 112.70 - 114.90 [06-MAR-2012]	31502 114.90 - 117.90 [06-MAR-2012]	31947 168.40 - 170.30 [06-MAR-2012]	31946 1703.90 - 172.10 [06-MAR-2012]
Client sampling date / time								
Compound	CAS Number	LOR	Unit	EB1206683-021	EB1206683-022	EB1206683-023	EB1206683-024	EB1206683-025
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.5	6.9	6.8	6.1	6.2
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	7.0	4.3	5.5	7.6	5.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-7.6	-35.3	-11.4	1.0	-0.8
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	302	553	542	365	238
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	14.6	39.6	16.9	6.6	6.3
ANC as CaCO3	----	0.1	% CaCO3	1.5	4.0	1.7	0.7	0.6
Fizz Rating	----	0	Fizz Unit	1	2	1	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.23	0.14	0.18	0.25	0.18



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31772 136.70 - 141.40	31773 141.90 - 144.30	31774 144.70 - 147.50	31775 147.90 - 150.40	31776 152.00 - 154.50
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-026	EB1206683-027	EB1206683-028	EB1206683-029	EB1206683-030
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.1	6.8	6.9	6.8	6.3
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	5.2	6.4	4.3	4.9	8.0
Net Acid Production Potential	----	0.5	kg H2SO4/t	-2.7	-32.0	-39.5	-29.9	0.6
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	248	605	568	519	269
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	7.9	38.4	43.8	34.8	7.4
ANC as CaCO3	----	0.1	% CaCO3	0.8	3.9	4.5	3.6	0.8
Fizz Rating	----	0	Fizz Unit	0	2	2	2	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.17	0.21	0.14	0.16	0.26



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31777 155.00 - 157.30 [06-MAR-2012]	31778 157.60 - 158.25 [06-MAR-2012]	31779 159.20 - 159.90 [06-MAR-2012]	31780 160.20 - 160.70 [06-MAR-2012]	31781 161.70 - 163.00 [06-MAR-2012]
Client sampling date / time								
Compound	CAS Number	LOR	Unit	EB1206683-031	EB1206683-032	EB1206683-033	EB1206683-034	EB1206683-035
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.0	6.5	6.8	6.8	6.8
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	5.8	3.7	5.8	6.1	3.4
Net Acid Production Potential	----	0.5	kg H2SO4/t	-32.0	-4.5	-33.8	-32.9	-9.0
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	624	371	581	615	478
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	37.8	8.2	39.6	39.0	12.4
ANC as CaCO3	----	0.1	% CaCO3	3.8	0.8	4.0	4.0	1.2
Fizz Rating	----	0	Fizz Unit	2	0	2	2	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.19	0.12	0.19	0.20	0.11



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31782 166.50 - 168.40	31783 209.50 - 210.60	31784 212.80 - 215.50	31785 216.90 - 217.80	31786 226.20 - 228.20
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-036	EB1206683-037	EB1206683-038	EB1206683-039	EB1206683-040
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.2	6.4	6.6	6.1	6.4
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	8.6	6.7	5.2	6.4	6.1
Net Acid Production Potential	----	0.5	kg H2SO4/t	-3.2	-1.1	-6.8	-2.1	-1.8
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	426	345	294	355	300
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	11.8	7.8	12.0	8.5	7.9
ANC as CaCO3	----	0.1	% CaCO3	1.2	0.8	1.2	0.9	0.8
Fizz Rating	----	0	Fizz Unit	1	0	1	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.28	0.22	0.17	0.21	0.20



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31787 234.90 - 236.70 [06-MAR-2012]	31788 247.70 - 249.20 [06-MAR-2012]	31938 102.90 - 103.80 [06-MAR-2012]	31939 104.20 - 105.65 [06-MAR-2012]	31940 111.50 - 111.90 [06-MAR-2012]
Client sampling date / time								
Compound	CAS Number	LOR	Unit	EB1206683-041	EB1206683-042	EB1206683-043	EB1206683-044	EB1206683-045
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.5	6.6	5.7	5.1	5.2
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	4.3	3.4	6.7	5.2	9.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-7.2	-3.9	1.8	-1.7	3.7
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	299	322	298	146	463
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	11.5	7.3	4.9	6.9	5.8
ANC as CaCO3	----	0.1	% CaCO3	1.2	0.7	0.5	0.7	0.6
Fizz Rating	----	0	Fizz Unit	1	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.14	0.11	0.22	0.17	0.31



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31941 112.10 - 113.30	31541 152.00 - 154.00	31540 154.00 - 157.00	31539 157.40 - 158.90	31538 158.90 - 161.90
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-046	EB1206683-047	EB1206683-048	EB1206683-049	EB1206683-050
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.1	6.7	6.4	6.1	6.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	10.7	2.1	3.7	7.3	5.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	5.0	-12.4	-35.9	-1.2	-26.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	197	240	317	298	281
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	5.7	14.6	39.6	8.6	32.4
ANC as CaCO3	----	0.1	% CaCO3	0.6	1.5	4.0	0.9	3.3
Fizz Rating	----	0	Fizz Unit	0	1	2	0	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.35	0.07	0.12	0.24	0.18



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31537 162.60 - 164.00	31536 164.50 - 165.60	31535 165.60 - 168.60	31534 168.60 - 171.60	31533 171.60 - 174.50
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-051	EB1206683-052	EB1206683-053	EB1206683-054	EB1206683-055
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.8	5.9	6.1	6.0	6.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	3.7	4.6	4.6	6.1	10.1
Net Acid Production Potential	----	0.5	kg H2SO4/t	-31.1	-3.8	-170	-170	3.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	664	364	302	258	294
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	34.8	8.4	175	176	6.2
ANC as CaCO3	----	0.1	% CaCO3	3.6	0.8	17.8	18.0	0.6
Fizz Rating	----	0	Fizz Unit	2	0	3	3	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.12	0.15	0.15	0.20	0.33



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31532 175.00 - 176.60	31531 176.60 - 179.60	31530 179.60 - 182.20	31529 182.20 - 184.00	31528 198.00 - 199.40
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-056	EB1206683-057	EB1206683-058	EB1206683-059	EB1206683-060
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.9	6.7	6.2	5.6	6.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	7.3	5.5	7.0	8.6	7.3
Net Acid Production Potential	----	0.5	kg H2SO4/t	-47.8	-2.7	<0.5	<0.5	1.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	579	399	308	404	232
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	55.2	8.2	7.1	8.5	6.2
ANC as CaCO3	----	0.1	% CaCO3	5.6	0.8	0.7	0.9	0.6
Fizz Rating	----	0	Fizz Unit	2	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.24	0.18	0.23	0.28	0.24



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				31527 201.90 - 202.40 [06-MAR-2012]	31526 228.20 - 229.80 [06-MAR-2012]	31525 237.60 - 239.40 [06-MAR-2012]	31524 248.10 - 249.40 [06-MAR-2012]	1 + 5 COMPOSITE [06-MAR-2012]
Client sampling date / time								
Compound	CAS Number	LOR	Unit	EB1206683-061	EB1206683-062	EB1206683-063	EB1206683-064	EB1206683-065
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.9	5.8	5.5	5.4	7.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	7.0	5.8	7.3	9.5	5.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.2	-2.6	-0.6	3.2	-44.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	273	341	320	379	1290
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	8.2	8.4	8.0	6.3	50.4
ANC as CaCO3	----	0.1	% CaCO3	0.8	0.8	0.8	0.6	5.1
Fizz Rating	----	0	Fizz Unit	0	0	0	0	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.23	0.19	0.24	0.31	0.18



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				2 + 5 COMPOSITE	3 + 5 COMPOSITE	4 + 5 COMPOSITE	5 + 5 COMPOSITE	7 + 5 COMPOSITE
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-066	EB1206683-067	EB1206683-068	EB1206683-069	EB1206683-070
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.2	7.5	7.3	7.4	7.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	3.1	3.4	4.9	1.5	0.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-60.0	-49.4	-32.9	-54.3	-8.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	761	923	997	1130	960
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	63.1	52.8	37.8	55.8	9.0
ANC as CaCO3	----	0.1	% CaCO3	6.4	5.4	3.8	5.7	0.9
Fizz Rating	----	0	Fizz Unit	2	2	2	2	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.10	0.11	0.16	0.05	0.02



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				8 + 5 COMPOSITE	9 + 5 COMPOSITE	10 + 5 COMPOSITE	11 + 5 COMPOSITE	12 + 5 COMPOSITE
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-071	EB1206683-072	EB1206683-073	EB1206683-074	EB1206683-075
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	3.0	5.9	6.7	5.9	6.6
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	102	3.4	2.1	3.1	4.9
Net Acid Production Potential	----	0.5	kg H2SO4/t	102	-5.0	-34.4	-12.7	-13.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	3340	670	1200	936	831
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	<0.5	8.4	36.6	15.8	18.3
ANC as CaCO3	----	0.1	% CaCO3	<0.1	0.8	3.7	1.6	1.9
Fizz Rating	----	0	Fizz Unit	0	0	2	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	3.35	0.11	0.07	0.10	0.16



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				13 + 5 COMPOSITE	15 + 5 COMPOSITE	16 + 5 COMPOSITE	17 + 5 COMPOSITE	18 + 5 COMPOSITE
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-076	EB1206683-077	EB1206683-078	EB1206683-079	EB1206683-080
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.2	5.3	4.9	6.9	7.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	8.6	8.9	3.1	3.7	2.8
Net Acid Production Potential	----	0.5	kg H2SO4/t	-8.4	-4.1	<0.5	-47.3	-34.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	1160	1080	837	1300	1040
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	17.0	13.0	2.8	51.0	37.2
ANC as CaCO3	----	0.1	% CaCO3	1.7	1.3	0.3	5.2	3.8
Fizz Rating	----	0	Fizz Unit	1	1	0	2	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.28	0.29	0.10	0.12	0.09



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				19 + 5 COMPOSITE	20 + 5 COMPOSITE	21 + 5 COMPOSITE	23 + 5 COMPOSITE	24 + 5 COMPOSITE
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-081	EB1206683-082	EB1206683-083	EB1206683-084	EB1206683-085
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.8	6.9	6.1	5.1	5.3
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	1.8	3.4	0.9	0.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-67.0	-19.1	-29.6	-3.5	-31.8
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	1330	1310	1800	945	951
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	68.5	20.9	33.0	4.4	32.4
ANC as CaCO3	----	0.1	% CaCO3	7.0	2.1	3.4	0.4	3.3
Fizz Rating	----	0	Fizz Unit	2	1	2	0	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.06	0.11	0.03	0.02



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				25 + 5 COMPOSITE	28 + 5 COMPOSITE	29 + 5 COMPOSITE	30 + 5 COMPOSITE	31 + 5 COMPOSITE
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-086	EB1206683-087	EB1206683-088	EB1206683-089	EB1206683-090
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	4.7	3.6	6.1	7.1	6.9
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	2.1	31.5	1.8	1.2	4.9
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.0	31.5	-30.6	-31.2	-42.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	1100	1900	647	806	1000
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	3.2	<0.5	32.4	32.4	47.4
ANC as CaCO3	----	0.1	% CaCO3	0.3	<0.1	3.3	3.3	4.8
Fizz Rating	----	0	Fizz Unit	0	0	2	2	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.07	1.03	0.06	0.04	0.16



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				32 + 5 COMPOSITE	33 + 5 COMPOSITE	34 + 5 COMPOSITE	35 + 5 COMPOSITE	36 + 5 COMPOSITE
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]
Compound	CAS Number	LOR	Unit	EB1206683-091	EB1206683-092	EB1206683-093	EB1206683-094	EB1206683-095
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.2	5.8	6.0	6.8	4.7
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	2.1	2.4	2.8	4.3	3.1
Net Acid Production Potential	----	0.5	kg H2SO4/t	-35.0	-46.2	-14.9	-11.9	-1.6
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	733	900	1060	595	654
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	37.2	48.6	17.7	16.2	4.7
ANC as CaCO3	----	0.1	% CaCO3	3.8	5.0	1.8	1.6	0.5
Fizz Rating	----	0	Fizz Unit	2	2	1	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.07	0.08	0.09	0.14	0.10



Analytical Results

Sub-Matrix: SOIL

Client sample ID

				37 + 5 COMPOSITE	12 - 5 COMPOSITE	16 - 5 COMPOSITE	34 - 5 COMPOSITE	----
Client sampling date / time				[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	[06-MAR-2012]	----
Compound	CAS Number	LOR	Unit	EB1206683-096	EB1206683-097	EB1206683-098	EB1206683-099	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.4	6.2	5.8	5.1	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	38.2	8.0	7.0	8.0	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-21.8	-0.9	0.8	2.0	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	820	358	494	466	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	60.1	8.9	6.2	5.9	----
ANC as CaCO3	----	0.1	% CaCO3	6.1	0.9	0.6	0.6	----
Fizz Rating	----	0	Fizz Unit	2	0	0	0	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	1.25	0.26	0.23	0.26	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1219958	Page	: 1 of 15
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 25-JUL-2012
Sampler	: Alan Robertson	Issue Date	: 21-AUG-2012
Site	: ----		
Quote number	: BN/057/11 V2	No. of samples received	: 110
		No. of samples analysed	: 47

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited
Laboratory 825

Accredited for
compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Greg Vogel	Laboratory Manager	Brisbane Inorganics
Myles Clark	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 15
Work Order : EB1219958
Client : RGS ENVIRONMENTAL PTY LTD
Project : Project Stone

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)				Client sample ID	31767 255.0-256.5	31768 277.5-278.5	31771 305.7-307.5	31511 90.5-93.5	31510 93.5-96.5
				Client sampling date / time	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit		EB1219958-009	EB1219958-010	EB1219958-013	EB1219958-014	EB1219958-015
EA026 : Chromium Reducible Sulfur									
Chromium Reducible Sulphur	----	0.005	%		0.013	0.022	0.734	0.025	0.042



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				31509 96.8-98.8	31947 168.4-170.3	31946 170.9-172.1	31772 136.7-141.4	31776 152.0-154.5
				06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit	EB1219958-016	EB1219958-024	EB1219958-025	EB1219958-026	EB1219958-030
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.022	0.040	0.011	0.013	0.011

Page : 5 of 15
 Work Order : EB1219958
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : Project Stone



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

				Client sample ID				
				Client sampling date / time	31782 166.5-168.4	31783 209.5-210.6	31785 216.9-217.8	31786 226.2-228.2
					06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit		EB1219958-036	EB1219958-037	EB1219958-039	EB1219958-040
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%		0.037	<0.005	<0.005	0.011
								0.013



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				31939 104.2-105.7	31940 111.5-111.9	31941 112.1-113.1	31539 157.4-158.9	31536 164.5-165.6
				06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit	EB1219958-044	EB1219958-045	EB1219958-046	EB1219958-049	EB1219958-052
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.016	0.135	0.141	0.030	0.025

Page : 7 of 15
 Work Order : EB1219958
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : Project Stone



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

				Client sample ID				
				Client sampling date / time	31533 171.6-174.5	31531 176.6-179.6	31530 179.6-182.2	31529 182.2-184.0
					06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit		EB1219958-055	EB1219958-057	EB1219958-058	EB1219958-059
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%		0.019	0.010	0.007	0.020



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				31527 201.9-202.4	31526 228.2-229.8	31525 237.6-239.4	31524 248.1-249.4	8+5 305.7-307.5
				06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit	EB1219958-061	EB1219958-062	EB1219958-063	EB1219958-064	EB1219958-071
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	<0.005	0.028	0.085	0.136	3.55



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)				Client sample ID	13+5 Composite	15+5 187.2-189.2	37+5 248.1-249.4	41041	41045
				Client sampling date / time	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit		EB1219958-076	EB1219958-077	EB1219958-096	EB1219958-097	EB1219958-098
EA026 : Chromium Reducible Sulfur									
Chromium Reducible Sulphur	----	0.005	%		0.201	0.359	1.26	0.023	0.085



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				34-5 Composite	1	2	3	4
Client sampling date / time				06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit	EB1219958-099	EB1219958-100	EB1219958-101	EB1219958-102	EB1219958-103
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.070	----	----	----	----
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	----	828	72	300	702
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	----	828	72	300	702
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	----	<1	<1	<1	<1
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	----	160	440	140	90
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	----	<10	10	10	10
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	----	230	40	110	210
Magnesium	7439-95-4	10	mg/kg	----	30	<10	30	40
Sodium	7440-23-5	10	mg/kg	----	200	210	110	150
Potassium	7440-09-7	10	mg/kg	----	10	10	<10	<10
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	----	520	540	250	350
Potassium	7440-09-7	50	mg/kg	----	150	290	100	90
Calcium	7440-70-2	50	mg/kg	----	7760	2300	2980	4280
Magnesium	7439-95-4	50	mg/kg	----	700	570	640	570
EG005S : Soluble Metals by ICPAES								
Aluminium	7429-90-5	1	mg/kg	----	<1	<1	<1	<1
Antimony	7440-36-0	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Arsenic	7440-38-2	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	1	mg/kg	----	2	2	3	2
Cadmium	7440-43-9	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Cobalt	7440-48-4	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Copper	7440-50-8	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Iron	7439-89-6	1	mg/kg	----	<1	<1	<1	<1
Lead	7439-92-1	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.1	mg/kg	----	0.3	0.4	0.2	0.5
Molybdenum	7439-98-7	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Nickel	7440-02-0	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Selenium	7782-49-2	0.1	mg/kg	----	0.1	0.2	0.1	0.2
Vanadium	7440-62-2	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				34-5 Composite	1	2	3	4
Client sampling date / time				06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit	EB1219958-099	EB1219958-100	EB1219958-101	EB1219958-102	EB1219958-103
EG005S : Soluble Metals by ICPAES - Continued								
Zinc	7440-66-6	0.1	mg/kg	----	<0.1	<0.1	<0.1	<0.1
Phosphorus	7723-14-0	10	mg/kg	----	<10	<10	<10	<10
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	----	2380	3300	1710	1970
Antimony	7440-36-0	5	mg/kg	----	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	----	<5	5	<5	<5
Boron	7440-42-8	50	mg/kg	----	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	3	4	4	3
Cobalt	7440-48-4	2	mg/kg	----	3	11	3	5
Copper	7440-50-8	5	mg/kg	----	18	34	13	19
Iron	7439-89-6	50	mg/kg	----	8690	8340	8560	5560
Lead	7439-92-1	5	mg/kg	----	10	13	9	12
Manganese	7439-96-5	5	mg/kg	----	286	207	297	203
Molybdenum	7439-98-7	2	mg/kg	----	<2	<2	<2	<2
Nickel	7440-02-0	2	mg/kg	----	<2	8	2	4
Selenium	7782-49-2	5	mg/kg	----	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	----	37	36	35	32
Zinc	7440-66-6	5	mg/kg	----	29	40	24	18
Phosphorus	7723-14-0	50	mg/kg	----	120	80	140	70
EG020S: Soluble Metals by ICPMS								
Uranium	7440-61-1	0.01	mg/kg	----	<0.01	<0.01	<0.01	<0.01
Thorium	7440-29-1	0.01	mg/kg	----	<0.01	<0.01	<0.01	<0.01
EG020T: Total Metals by ICP-MS								
Uranium	7440-61-1	0.1	mg/kg	----	0.8	0.7	0.8	0.8
Thorium	7440-29-1	0.1	mg/kg	----	4.0	4.8	4.3	4.6



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				5	6	7	8	9
				06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit	EB1219958-104	EB1219958-105	EB1219958-106	EB1219958-107	EB1219958-108
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	60	318	780	156	510
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	60	318	780	156	510
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	<1	<1	<1	<1	<1
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	280	120	970	330	220
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	30	40	330	440	780
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	40	100	580	200	390
Magnesium	7439-95-4	10	mg/kg	30	30	70	40	70
Sodium	7440-23-5	10	mg/kg	100	100	300	200	220
Potassium	7440-09-7	10	mg/kg	10	20	30	20	20
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	160	240	560	350	360
Potassium	7440-09-7	50	mg/kg	80	160	390	340	270
Calcium	7440-70-2	50	mg/kg	1090	3180	11600	3240	6740
Magnesium	7439-95-4	50	mg/kg	440	700	1190	860	980
EG005S : Soluble Metals by ICPAES								
Aluminium	7429-90-5	1	mg/kg	3	<1	<1	<1	<1
Antimony	7440-36-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	7440-38-2	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	1	mg/kg	4	2	<1	1	<1
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt	7440-48-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	7440-50-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Iron	7439-89-6	1	mg/kg	1	<1	<1	<1	<1
Lead	7439-92-1	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.1	mg/kg	0.4	0.2	1.4	1.0	1.3
Molybdenum	7439-98-7	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	7440-02-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	7782-49-2	0.1	mg/kg	0.2	0.1	0.2	0.2	0.2
Vanadium	7440-62-2	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	7440-66-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus	7723-14-0	10	mg/kg	<10	<10	<10	<10	<10



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				5	6	7	8	9
Client sampling date / time				06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00	06-MAR-2012 15:00
Compound	CAS Number	LOR	Unit	EB1219958-104	EB1219958-105	EB1219958-106	EB1219958-107	EB1219958-108
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	860	1630	5360	4890	5220
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	<5	12	<5	<5
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	6	4	6	5	3
Cobalt	7440-48-4	2	mg/kg	7	4	4	4	4
Copper	7440-50-8	5	mg/kg	12	18	33	43	59
Iron	7439-89-6	50	mg/kg	2110	11200	21600	21100	21100
Lead	7439-92-1	5	mg/kg	8	12	19	15	20
Manganese	7439-96-5	5	mg/kg	10	280	532	727	1300
Molybdenum	7439-98-7	2	mg/kg	<2	<2	<2	<2	<2
Nickel	7440-02-0	2	mg/kg	8	5	4	4	3
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	26	35	19	24	23
Zinc	7440-66-6	5	mg/kg	13	26	51	30	34
Phosphorus	7723-14-0	50	mg/kg	<50	120	270	190	190
EG020S: Soluble Metals by ICPMS								
Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	7440-29-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
EG020T: Total Metals by ICP-MS								
Uranium	7440-61-1	0.1	mg/kg	0.7	0.9	0.9	0.9	1.1
Thorium	7440-29-1	0.1	mg/kg	3.3	5.2	8.0	7.5	9.2



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				10	11	----	----	----
				06-MAR-2012 15:00	06-MAR-2012 15:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1219958-109	EB1219958-110	----	----	----
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	<1	234	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	<1	234	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	<1	<1	----	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	1880	300	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	240	360	----	----	----
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	120	230	----	----	----
Magnesium	7439-95-4	10	mg/kg	50	60	----	----	----
Sodium	7440-23-5	10	mg/kg	30	120	----	----	----
Potassium	7440-09-7	10	mg/kg	<10	40	----	----	----
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	140	220	----	----	----
Potassium	7440-09-7	50	mg/kg	370	350	----	----	----
Calcium	7440-70-2	50	mg/kg	680	3330	----	----	----
Magnesium	7439-95-4	50	mg/kg	260	1180	----	----	----
EG005S : Soluble Metals by ICPAES								
Aluminium	7429-90-5	1	mg/kg	29	<1	----	----	----
Antimony	7440-36-0	0.1	mg/kg	<0.1	<0.1	----	----	----
Arsenic	7440-38-2	0.1	mg/kg	<0.1	<0.1	----	----	----
Boron	7440-42-8	1	mg/kg	<1	1	----	----	----
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	----	----	----
Chromium	7440-47-3	0.1	mg/kg	<0.1	<0.1	----	----	----
Cobalt	7440-48-4	0.1	mg/kg	2.1	<0.1	----	----	----
Copper	7440-50-8	0.1	mg/kg	0.6	<0.1	----	----	----
Iron	7439-89-6	1	mg/kg	58	<1	----	----	----
Lead	7439-92-1	0.1	mg/kg	<0.1	<0.1	----	----	----
Manganese	7439-96-5	0.1	mg/kg	8.9	0.4	----	----	----
Molybdenum	7439-98-7	0.1	mg/kg	<0.1	<0.1	----	----	----
Nickel	7440-02-0	0.1	mg/kg	2.8	<0.1	----	----	----
Selenium	7782-49-2	0.1	mg/kg	0.1	0.2	----	----	----
Vanadium	7440-62-2	0.1	mg/kg	<0.1	<0.1	----	----	----
Zinc	7440-66-6	0.1	mg/kg	1.6	<0.1	----	----	----
Phosphorus	7723-14-0	10	mg/kg	<10	<10	----	----	----



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				10	11	----	----	----
Client sampling date / time				06-MAR-2012 15:00	06-MAR-2012 15:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1219958-109	EB1219958-110	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	4330	3770	----	----	----
Antimony	7440-36-0	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	18	7	----	----	----
Boron	7440-42-8	50	mg/kg	<50	<50	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	4	4	----	----	----
Cobalt	7440-48-4	2	mg/kg	15	4	----	----	----
Copper	7440-50-8	5	mg/kg	34	28	----	----	----
Iron	7439-89-6	50	mg/kg	12000	42700	----	----	----
Lead	7439-92-1	5	mg/kg	18	20	----	----	----
Manganese	7439-96-5	5	mg/kg	78	907	----	----	----
Molybdenum	7439-98-7	2	mg/kg	<2	<2	----	----	----
Nickel	7440-02-0	2	mg/kg	24	6	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Vanadium	7440-62-2	5	mg/kg	20	23	----	----	----
Zinc	7440-66-6	5	mg/kg	13	56	----	----	----
Phosphorus	7723-14-0	50	mg/kg	100	180	----	----	----
EG020S: Soluble Metals by ICPMS								
Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	----	----	----
Thorium	7440-29-1	0.01	mg/kg	<0.01	<0.01	----	----	----
EG020T: Total Metals by ICP-MS								
Uranium	7440-61-1	0.1	mg/kg	1.6	1.1	----	----	----
Thorium	7440-29-1	0.1	mg/kg	8.7	9.4	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1227477	Page	: 1 of 17
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 22-OCT-2012
Sampler	: ----	Issue Date	: 05-NOV-2012
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 73
		No. of samples analysed	: 73

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics
Jonathon Angell	Inorganic Coordinator	Stafford Minerals - AY
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.

Page : 3 of 17
 Work Order : EB1227477
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : Project Stone



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD001 0-10m	AMD002 10-20m	AMD003 20-29m	AMD004 31-40m	AMD005 50-60m
				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-001	EB1227477-002	EB1227477-003	EB1227477-004	EB1227477-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.5	7.4	8.0	8.9	9.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	<0.5	<0.5	0.9	0.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.4	-6.1	-8.2	-28.0	-22.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	142	293	334	441	400
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	1.4	6.1	8.2	28.9	23.0
ANC as CaCO3	----	0.1	% CaCO3	0.1	0.6	0.8	2.9	2.3
Fizz Rating	----	0	Fizz Unit	0	0	0	2	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	<0.01	0.03	0.02



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD006 70-80m	AMD007 90-100m	AMD008 110-120m	AMD009 130-139m	AMD010 146.32-146.71m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-006	EB1227477-007	EB1227477-008	EB1227477-009	EB1227477-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.1	8.9	8.9	8.7	9.4
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	0.6	0.6	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-32.3	-29.5	-49.3	-64.7	-76.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	314	378	337	421	151
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	32.9	30.1	49.9	65.0	76.4
ANC as CaCO3	----	0.1	% CaCO3	3.4	3.1	5.1	6.6	7.8
Fizz Rating	----	0	Fizz Unit	2	2	2	2	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	0.02	0.02	0.01	<0.01



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD011 155.92-156.31m	AMD012 160.80-161.07m	AMD013 178.40-178.80m	AMD014 187.18-187.45m	AMD015 188.19-188.52m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-011	EB1227477-012	EB1227477-013	EB1227477-014	EB1227477-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.2	9.2	9.9	9.0	9.6
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	1.5	1.2	7.0	2.4
Net Acid Production Potential	----	0.5	kg H2SO4/t	-10.3	-9.1	-36.4	-1.6	-10.2
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	146	287	757	145	315
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	10.9	10.6	37.6	8.6	12.6
ANC as CaCO3	----	0.1	% CaCO3	1.1	1.1	3.8	0.9	1.3
Fizz Rating	----	0	Fizz Unit	1	0	2	0	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	0.05	0.04	0.23	0.08



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD016 188.60-189.00m	AMD017 189.22-189.57m	AMD018 191.74-192.06m	AMD019 192.84-193.25m	AMD020 199.67-199.92m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-016	EB1227477-017	EB1227477-018	EB1227477-019	EB1227477-020
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	10.0	8.9	8.2	9.2	9.8
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	2.1	2.8	7.0	1.5	0.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-22.2	-6.9	2.7	-4.6	-97.7
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	835	349	116	243	669
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	24.3	9.7	4.3	6.1	98.3
ANC as CaCO3	----	0.1	% CaCO3	2.5	1.0	0.4	0.6	10.0
Fizz Rating	----	0	Fizz Unit	1	0	0	0	3
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.07	0.09	0.23	0.05	0.02



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD021 201.33-201.72m	AMD022 212.04-212.52m	AMD023 221.54-221.99m	AMD024 229.15-229.61m	AMD025 231.56-231.95m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-021	EB1227477-022	EB1227477-023	EB1227477-024	EB1227477-025
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.6	9.9	9.8	5.8	9.7
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	0.6	0.9	0.6	0.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-6.7	-328	-40.3	-5.9	-5.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	258	245	712	289	215
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	7.3	329	41.2	6.5	5.7
ANC as CaCO3	----	0.1	% CaCO3	0.7	33.5	4.2	0.7	0.6
Fizz Rating	----	0	Fizz Unit	0	3	2	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	0.02	0.03	0.02	0.02



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD026 237.57-237.72m	AMD027 239.63-239.89m	AMD028 241.64-241.79m	AMD029 242.92-243.20m	AMD030 246.07-246.40m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-026	EB1227477-027	EB1227477-028	EB1227477-029	EB1227477-030
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	10.6	9.6	10.8	10.8	11.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.2	10.1	<0.5	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-21.6	-2.7	-23.7	-15.5	-32.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	905	201	1160	916	1120
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	22.8	12.8	23.7	15.5	32.4
ANC as CaCO3	----	0.1	% CaCO3	2.3	1.3	2.4	1.6	3.3
Fizz Rating	----	0	Fizz Unit	1	1	1	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.04	0.33	<0.01	<0.01	0.01



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD031 0-12m	AMD032 13-29m	AMD033 30-40m	AMD034 41-67m	AMD035 68-80m
				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-031	EB1227477-032	EB1227477-033	EB1227477-034	EB1227477-035
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.8	6.3	6.8	6.8	6.7
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	1.2	<0.5	2.4	0.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	0.9	<0.5	-0.5	2.4	-2.2
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	1300	1320	1320	422	371
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	<0.5	1.2	0.5	<0.5	2.8
ANC as CaCO3	----	0.1	% CaCO3	<0.1	0.1	<0.1	<0.1	0.3
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	0.04	<0.01	0.08	0.02



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD036 90-100m	AMD037 110-120m	AMD038 130-140m	AMD039 150-160m	AMD040 170-180m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-036	EB1227477-037	EB1227477-038	EB1227477-039	EB1227477-040
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.9	8.7	9.0	9.1	9.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	0.6	<0.5	0.6	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-8.6	-11.2	-12.6	-46.4	-11.8
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	633	418	401	318	317
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	9.2	11.8	12.6	47.0	11.8
ANC as CaCO3	----	0.1	% CaCO3	0.9	1.2	1.3	4.8	1.2
Fizz Rating	----	0	Fizz Unit	0	1	1	1	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	0.02	<0.01	0.02	<0.01



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD041 190-205m	AMD042 212.89-213.84m	AMD043 221.97-222.30m	AMD044 227.16-227.54m	AMD045 233.86-234.20m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-041	EB1227477-042	EB1227477-043	EB1227477-044	EB1227477-045
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.8	9.4	9.4	9.5	9.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	<0.5	<0.5	<0.5	0.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-32.0	-108	-9.7	-274	-6.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	415	119	165	133	104
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	32.6	108	9.7	274	7.0
ANC as CaCO3	----	0.1	% CaCO3	3.3	11.0	1.0	27.9	0.7
Fizz Rating	----	0	Fizz Unit	1	2	3	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	<0.01	<0.01	<0.01	0.02



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD046 238.58-238.90m	AMD047 240.41-240.79m	AMD048 242.24-242.52m	AMD049 270.37-270.78m	AMD050 273.22-273.57m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-046	EB1227477-047	EB1227477-048	EB1227477-049	EB1227477-050
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.0	8.8	9.1	10.0	9.6
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	0.6	<0.5	0.9	5.8
Net Acid Production Potential	----	0.5	kg H2SO4/t	-6.8	-5.9	-9.8	-8.8	-3.7
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	192	97	304	428	824
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	7.1	6.5	10.1	9.7	9.5
ANC as CaCO3	----	0.1	% CaCO3	0.7	0.7	1.0	1.0	1.0
Fizz Rating	----	0	Fizz Unit	0	0	0	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.01	0.02	0.01	0.03	0.19



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD051 274.42-274.65m	AMD052 278.08-278.43m	AMD053 280.90-281.26m	AMD054 282.35-282.63m	AMD055 286.31-286.63m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-051	EB1227477-052	EB1227477-053	EB1227477-054	EB1227477-055
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.2	9.2	9.8	10.0	8.2
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	7.0	0.6	0.6	<0.5	5.8
Net Acid Production Potential	----	0.5	kg H2SO4/t	-5.5	-25.3	-31.5	-25.2	-2.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	598	284	563	697	202
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	12.5	25.9	32.1	25.2	7.9
ANC as CaCO3	----	0.1	% CaCO3	1.3	2.6	3.3	2.6	0.8
Fizz Rating	----	0	Fizz Unit	1	1	2	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.23	0.02	0.02	<0.01	0.19



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD056 289.29-289.49m	AMD057 290.43-290.66m	AMD058 300.40-300.79m	AMD059 305.84-306.21m	AMD060 309.32-309.66m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-056	EB1227477-057	EB1227477-058	EB1227477-059	EB1227477-060
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.2	9.0	9.5	9.2	10.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	0.6	0.6	1.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-5.6	<0.5	-41.3	-5.1	-11.2
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	55	91	422	87	547
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	6.2	0.7	41.9	6.6	11.2
ANC as CaCO3	----	0.1	% CaCO3	0.6	<0.1	4.3	0.7	1.1
Fizz Rating	----	0	Fizz Unit	1	1	2	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	0.02	0.02	0.05	<0.01



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD061 0-15m	AMD062 16-25m	AMD063 26-40m	AMD064 41-55m	AMD065 56-86m
				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-061	EB1227477-062	EB1227477-063	EB1227477-064	EB1227477-065
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.3	7.1	7.6	7.3	7.2
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	<0.5	<0.5	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	<0.5	<0.5	-1.4	-1.2	-1.6
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	184	246	250	270	305
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	<0.5	<0.5	1.4	1.2	1.6
ANC as CaCO3	----	0.1	% CaCO3	<0.1	<0.1	0.1	0.1	0.2
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	<0.01	<0.01	<0.01



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD066 90.14-90.51m	AMD067 91.29-91.59m	AMD068 113.03-113.26m	AMD069 126.14-126.54m	AMD070 128.49-128.75m
Client sampling date / time				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]
Compound	CAS Number	LOR	Unit	EB1227477-066	EB1227477-067	EB1227477-068	EB1227477-069	EB1227477-070
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.0	6.9	6.8	8.8	8.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	<0.5	6.7	0.6	8.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-7.1	-6.8	0.5	-106	1.3
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	140	89	213	167	569
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	7.1	6.8	6.2	107	7.3
ANC as CaCO3	----	0.1	% CaCO3	0.7	0.7	0.6	10.9	0.7
Fizz Rating	----	0	Fizz Unit	0	0	0	3	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	0.22	0.02	0.28



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD071 132.84-133.20m	AMD072 133.45-133.61m	AMD073 135.47-135.73m	----	----
				[18-OCT-2012]	[18-OCT-2012]	[18-OCT-2012]	----	----
Compound	CAS Number	LOR	Unit	EB1227477-071	EB1227477-072	EB1227477-073	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.3	8.0	6.6	----	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	8.6	6.1	----	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-2.9	1.9	1.2	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	568	183	195	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	4.4	6.7	4.9	----	----
ANC as CaCO3	----	0.1	% CaCO3	0.4	0.7	0.5	----	----
Fizz Rating	----	0	Fizz Unit	0	0	0	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.28	0.20	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1231346	Page	: 1 of 7
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 30-NOV-2012
Sampler	: A.Tarr & S.Miller	Issue Date	: 19-DEC-2012
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 24
		No. of samples analysed	: 24

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Stafford Minerals - AY



Page : 2 of 7
Work Order : EB1231346
Client : RGS ENVIRONMENTAL PTY LTD
Project : Project Stone

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD074 Over Burden	AMD075 Over Burden	AMD076 Over Burden	AMD077 Over Burden	AMD078 Over Burden
Client sampling date / time				26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00
Compound	CAS Number	LOR	Unit	EB1231346-001	EB1231346-002	EB1231346-003	EB1231346-004	EB1231346-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.8	5.8	5.8	5.9	5.9
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	0.9	<0.5	0.6	0.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	<0.5	-0.7	-0.9	-0.7	<0.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	275	139	212	165	449
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	0.8	1.6	0.9	1.3	0.8
ANC as CaCO3	----	0.1	% CaCO3	<0.1	0.2	<0.1	0.1	<0.1
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	0.03	<0.01	0.02	0.02



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD079 Over Burden	AMD080 Over Burden	AMD081 Over Burden	AMD082 Over Burden	AMD083 Over Burden
Client sampling date / time				26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00
Compound	CAS Number	LOR	Unit	EB1231346-006	EB1231346-007	EB1231346-008	EB1231346-009	EB1231346-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.1	7.1	7.7	8.3	8.3
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	<0.5	<0.5	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-3.3	-7.1	-6.3	-10.0	-25.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	259	258	232	398	526
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	3.9	7.1	6.3	10.3	25.7
ANC as CaCO3	----	0.1	% CaCO3	0.4	0.7	0.6	1.0	2.6
Fizz Rating	----	0	Fizz Unit	0	0	0	0	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	<0.01	<0.01	0.01	0.01



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD084 Over Burden	AMD085 Over Burden	AMD086 Over Burden	AMD087 Over Burden	AMD088 Roof AU2
Client sampling date / time				26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00
Compound	CAS Number	LOR	Unit	EB1231346-011	EB1231346-012	EB1231346-013	EB1231346-014	EB1231346-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.5	8.4	9.1	7.8	7.5
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.6	0.6	1.2	1.2	7.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-65.5	-32.6	-15.0	-6.3	-1.6
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	470	680	270	295	235
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	66.1	33.2	16.2	7.5	9.3
ANC as CaCO3	----	0.1	% CaCO3	6.7	3.4	1.6	0.8	1.0
Fizz Rating	----	0	Fizz Unit	2	2	1	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.02	0.02	0.04	0.04	0.25



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD089 Floor AU1	AMD090 AU2/AL6 Interburden	AMD091 AU2/AL6 Interburden	AMD092 AU2/AL6 Interburden	AMD093 B2/C4 Interburden
Client sampling date / time				26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00
Compound	CAS Number	LOR	Unit	EB1231346-016	EB1231346-017	EB1231346-018	EB1231346-019	EB1231346-020
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.7	8.6	8.8	9.8	8.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	9.8	2.1	0.9	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-24.5	-47.6	-26.9	-62.7	-2.7
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	445	830	801	281	155
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	34.3	49.7	27.8	63.0	2.7
ANC as CaCO3	----	0.1	% CaCO3	3.5	5.1	2.8	6.4	0.3
Fizz Rating	----	0	Fizz Unit	2	2	2	2	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.32	0.07	0.03	0.01	<0.01



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD094 B2/C4 Interburden	AMD095 C4 Roof	AMD096 C3/C2 Interburden	AMD097 C3/C1 Interburden	----
				26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	26-NOV-2012 07:00	----
				EB1231346-021	EB1231346-022	EB1231346-023	EB1231346-024	----
Compound	CAS Number	LOR	Unit					
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.3	9.2	10.0	8.7	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	7.6	<0.5	0.9	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-292	-0.6	-6.0	-7.7	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	149	301	135	180	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	292	8.2	6.0	8.6	----
ANC as CaCO3	----	0.1	% CaCO3	29.8	0.8	0.6	0.9	----
Fizz Rating	----	0	Fizz Unit	3	0	0	0	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	0.25	<0.01	0.03	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1312454	Page	: 1 of 6
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 22-MAY-2013
Sampler	: Ashley Tarr	Issue Date	: 06-JUN-2013
Site	: MacMines Project Stone		
Quote number	: BN/413/12	No. of samples received	: 16
		No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.**



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD098	AMD099	AMD100	AMD101	AMD102
				14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00
Compound	CAS Number	LOR	Unit	EB1312454-001	EB1312454-002	EB1312454-003	EB1312454-004	EB1312454-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.2	8.4	8.0	7.7	11.5
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	<0.5	<0.5	<0.5	15.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-6.6	-5.9	-1.0	-0.9	-64.2
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	293	254	190	183	3140
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	6.6	5.9	1.0	0.9	79.8
ANC as CaCO3	----	0.1	% CaCO3	0.7	0.6	0.1	<0.1	8.1
Fizz Rating	----	0	Fizz Unit	0	0	0	0	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	<0.01	<0.01	0.51



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD103	AMD104	AMD 110	AMD 111	AMD112
Client sampling date / time				14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00
Compound	CAS Number	LOR	Unit	EB1312454-006	EB1312454-007	EB1312454-008	EB1312454-009	EB1312454-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	11.5	9.0	7.4	8.9	7.2
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	2.1	2.1	8.3	1.5	1.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-31.8	-2.8	5.9	-5.2	1.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	1520	755	450	148	71
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	34.0	5.0	2.4	6.7	<0.5
ANC as CaCO3	----	0.1	% CaCO3	3.5	0.5	0.2	0.7	<0.1
Fizz Rating	----	0	Fizz Unit	2	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.07	0.07	0.27	0.05	0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD113	AMD114	AMD 115	AMD116	AMD105
Client sampling date / time				14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00	14-MAY-2013 11:00
Compound	CAS Number	LOR	Unit	EB1312454-011	EB1312454-012	EB1312454-013	EB1312454-014	EB1312454-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.0	6.8	6.8	6.8	9.5
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	2.8	<0.5	2.1	2.1	1.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	2.8	<0.5	2.1	2.1	-27.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	123	48	90	89	206
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	<0.5	<0.5	<0.5	<0.5	29.0
ANC as CaCO3	----	0.1	% CaCO3	<0.1	<0.1	<0.1	<0.1	3.0
Fizz Rating	----	0	Fizz Unit	0	0	0	0	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.09	<0.01	0.07	0.07	0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

AMD106

Client sampling date / time

14-MAY-2013 11:00

Compound	CAS Number	LOR	Unit	EB1312454-016	----	----	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.2	----	----	----	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.2	----	----	----	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-15.6	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	277	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	16.8	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	1.7	----	----	----	----
Fizz Rating	----	0	Fizz Unit	1	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.04	----	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1313278	Page	: 1 of 8
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 31-MAY-2013
Sampler	: Ashley Tarr	Issue Date	: 11-JUN-2013
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 29
		No. of samples analysed	: 29

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Stephen Hislop	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

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When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.**



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD 107 OverBurden	AMD 108 OverBurden	AMD 109 OverBurden	AMD117 OverBurden	AMD118 OverBurden
Client sampling date / time				29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15
Compound	CAS Number	LOR	Unit	EB1313278-001	EB1313278-002	EB1313278-003	EB1313278-004	EB1313278-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.8	9.4	9.5	9.0	7.9
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	<0.5	<0.5	0.9	1.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.8	-6.5	-38.3	-124	-3.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	443	287	216	145	140
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	2.7	6.5	38.3	125	5.0
ANC as CaCO3	----	0.1	% CaCO3	0.3	0.6	3.9	12.8	0.5
Fizz Rating	----	0	Fizz Unit	0	0	2	3	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	<0.01	<0.01	0.03	0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD119 OverBurden	AMD120 AU4 Floor	AMD121 AU4 Roof	AMD122 AU3b Roof	AMD123 AL1 Floor
Client sampling date / time				29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15
Compound	CAS Number	LOR	Unit	EB1313278-006	EB1313278-007	EB1313278-008	EB1313278-009	EB1313278-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.7	7.9	7.9	8.9	8.7
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	3.1	0.9	2.1	2.8
Net Acid Production Potential	----	0.5	kg H2SO4/t	-5.1	-4.1	-2.4	-18.6	-7.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	138	180	32	285	225
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	6.0	7.2	3.3	20.8	9.9
ANC as CaCO3	----	0.1	% CaCO3	0.6	0.7	0.3	2.1	1.0
Fizz Rating	----	0	Fizz Unit	0	0	0	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	0.10	0.03	0.07	0.09



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD124 AL5 Roof	AMD125 AL5 Floor	AMD126 AL1L Floor	AMD127 B2 Roof	AMD128 B2L Floor
Client sampling date / time				29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15
Compound	CAS Number	LOR	Unit	EB1313278-011	EB1313278-012	EB1313278-013	EB1313278-014	EB1313278-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.3	8.8	8.9	7.7	7.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	1.8	1.8	3.4	3.4
Net Acid Production Potential	----	0.5	kg H2SO4/t	-83.4	-20.2	-59.1	-2.3	-2.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	162	309	166	131	97
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	84.9	22.0	60.9	5.7	5.5
ANC as CaCO3	----	0.1	% CaCO3	8.6	2.2	6.2	0.6	0.6
Fizz Rating	----	0	Fizz Unit	2	1	2	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.06	0.06	0.11	0.11



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD129 C5 Roof	AMD130 C5 Floor	AMD131 C4 Roof	AMD132 C3 Floor	AMD133 C2 Roof
Client sampling date / time				29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15
Compound	CAS Number	LOR	Unit	EB1313278-016	EB1313278-017	EB1313278-018	EB1313278-019	EB1313278-020
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.1	8.1	6.9	7.4	7.4
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	4.6	2.4	8.3	2.1	1.8
Net Acid Production Potential	----	0.5	kg H2SO4/t	-0.9	-9.0	2.4	-1.8	-4.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	168	365	158	74	82
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	5.5	11.4	5.9	3.9	5.9
ANC as CaCO3	----	0.1	% CaCO3	0.6	1.2	0.6	0.4	0.6
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.15	0.08	0.27	0.07	0.06



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD134 C2 Floor	AMD135 C1 Roof	AMD136 C1 Floor	AMD137 D3 Roof	AMD138 D3 Floor
				29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15
Compound	CAS Number	LOR	Unit	EB1313278-021	EB1313278-022	EB1313278-023	EB1313278-024	EB1313278-025
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.9	8.2	8.4	9.0	7.5
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	0.9	1.2	1.5	3.1
Net Acid Production Potential	----	0.5	kg H2SO4/t	-3.8	-36.7	-45.6	-22.6	-6.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	80	187	235	272	82
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	5.3	37.6	46.8	24.1	10.0
ANC as CaCO3	----	0.1	% CaCO3	0.5	3.8	4.8	2.5	1.0
Fizz Rating	----	0	Fizz Unit	0	2	2	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.03	0.04	0.05	0.10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD139 D2 Roof	AMD140 D1 Floor	AMD141 E2 Roof	AMD142 E2 Floor	----
Client sampling date / time				29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	----
Compound	CAS Number	LOR	Unit	EB1313278-026	EB1313278-027	EB1313278-028	EB1313278-029	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.4	8.6	7.2	7.6	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	4.6	1.2	1.8	0.9	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-2.2	-8.7	-2.8	-2.3	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	133	268	67	41	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	6.8	9.9	4.6	3.2	----
ANC as CaCO3	----	0.1	% CaCO3	0.7	1.0	0.5	0.3	----
Fizz Rating	----	0	Fizz Unit	0	0	0	0	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.15	0.04	0.06	0.03	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1313889	Page	: 1 of 6
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 07-JUN-2013
Sampler	: Ashley Tarr	Issue Date	: 19-JUN-2013
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 16
		No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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- General Comments
- Analytical Results



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Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.**



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD143	AMD144	AMD145	AMD146	AMD147
				31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00
Compound	CAS Number	LOR	Unit	EB1313889-001	EB1313889-002	EB1313889-003	EB1313889-004	EB1313889-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.7	6.5	8.7	6.3	8.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	<0.5	0.9	0.9	3.1
Net Acid Production Potential	----	0.5	kg H2SO4/t	<0.5	-1.1	-28.6	-7.0	-1.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	221	268	281	157	209
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	<0.5	1.1	29.5	7.9	4.5
ANC as CaCO3	----	0.1	% CaCO3	<0.1	0.1	3.0	0.8	0.4
Fizz Rating	----	0	Fizz Unit	0	0	2	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	0.03	0.03	0.10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD148	AMD149	AMD150	AMD151	AMD152
Client sampling date / time				31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00
Compound	CAS Number	LOR	Unit	EB1313889-006	EB1313889-007	EB1313889-008	EB1313889-009	EB1313889-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.7	8.5	9.4	9.6	8.9
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	1.5	1.2	1.2	2.1
Net Acid Production Potential	----	0.5	kg H2SO4/t	-7.4	-2.4	-315	-255	-4.6
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	334	110	152	187	95
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	8.9	3.9	316	256	6.7
ANC as CaCO3	----	0.1	% CaCO3	0.9	0.4	32.2	26.1	0.7
Fizz Rating	----	0	Fizz Unit	0	0	4	4	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.05	0.04	0.04	0.07



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD153	AMD154	AMD155	AMD156	AMD157
Client sampling date / time				31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00	31-MAY-2013 11:00
Compound	CAS Number	LOR	Unit	EB1313889-011	EB1313889-012	EB1313889-013	EB1313889-014	EB1313889-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.2	9.3	9.1	9.5	9.7
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	8.3	1.2	1.5	7.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-4.4	<0.5	-4.0	-8.6	-7.0
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	112	66	147	359	255
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	5.9	7.9	5.2	10.1	14.6
ANC as CaCO3	----	0.1	% CaCO3	0.6	0.8	0.5	1.0	1.5
Fizz Rating	----	0	Fizz Unit	0	0	0	0	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.27	0.04	0.05	0.25



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

AMD158

Client sampling date / time

31-MAY-2013 11:00

Compound	CAS Number	LOR	Unit	EB1313889-016	----	----	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.6	----	----	----	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	----	----	----	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.3	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	33	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	2.2	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	0.2	----	----	----	----
Fizz Rating	----	0	Fizz Unit	0	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	----	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1313885	Page	: 1 of 6
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 07-JUN-2013
Sampler	: Ashley Tarr	Issue Date	: 21-JUN-2013
Site	: MacMines Project Stone		
Quote number	: BN/413/12	No. of samples received	: 18
		No. of samples analysed	: 18

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Signatories	Position	Accreditation Category
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils



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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.**



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD159	AMD160	AMD161	AMD162	AMD163
				05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00
Compound	CAS Number	LOR	Unit	EB1313885-001	EB1313885-002	EB1313885-003	EB1313885-004	EB1313885-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.3	6.4	7.9	7.2	8.9
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	<0.5	0.6	0.9	0.9
Net Acid Production Potential	----	0.5	kg H2SO4/t	<0.5	<0.5	-2.9	0.9	-397
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	75	146	301	199	159
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	<0.5	<0.5	3.5	<0.5	398
ANC as CaCO3	----	0.1	% CaCO3	<0.1	<0.1	0.4	<0.1	40.6
Fizz Rating	----	0	Fizz Unit	0	0	0	0	4
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	0.02	0.03	0.03



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD164	AMD165	AMD166	AMD167	AMD168
Client sampling date / time				05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00
Compound	CAS Number	LOR	Unit	EB1313885-006	EB1313885-007	EB1313885-008	EB1313885-009	EB1313885-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.1	8.3	7.9	8.3	8.4
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.8	1.5	2.4	2.4	7.3
Net Acid Production Potential	----	0.5	kg H2SO4/t	-3.0	-4.4	-2.4	-7.6	-9.2
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	147	256	156	480	460
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	4.8	5.9	4.9	10.0	16.5
ANC as CaCO3	----	0.1	% CaCO3	0.5	0.6	0.5	1.0	1.7
Fizz Rating	----	0	Fizz Unit	0	0	0	0	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.06	0.05	0.08	0.08	0.24



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD169	AMD170	AMD171	AMD172	AMD173
Client sampling date / time				05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00
Compound	CAS Number	LOR	Unit	EB1313885-011	EB1313885-012	EB1313885-013	EB1313885-014	EB1313885-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.3	8.7	9.1	8.4	7.4
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	2.1	1.2	4.3	4.3
Net Acid Production Potential	----	0.5	kg H2SO4/t	-3.8	-7.4	-9.8	-6.0	1.3
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	228	254	239	401	93
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	5.3	9.6	11.0	10.3	3.0
ANC as CaCO3	----	0.1	% CaCO3	0.5	1.0	1.1	1.0	0.3
Fizz Rating	----	0	Fizz Unit	0	0	1	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.07	0.04	0.14	0.14



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD174	AMD175	AMD176	----	----
Client sampling date / time				05-JUN-2013 11:00	05-JUN-2013 11:00	05-JUN-2013 11:00	----	----
Compound	CAS Number	LOR	Unit	EB1313885-016	EB1313885-017	EB1313885-018	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.6	8.2	8.6	----	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.2	2.1	1.2	----	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-17.3	-19.2	-1.4	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	291	189	57	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	18.5	21.3	2.6	----	----
ANC as CaCO3	----	0.1	% CaCO3	1.9	2.2	0.3	----	----
Fizz Rating	----	0	Fizz Unit	1	1	0	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.04	0.07	0.04	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1315494	Page	: 1 of 6
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 27-JUN-2013
Sampler	: Ashley Tarr	Issue Date	: 11-JUL-2013
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 18
		No. of samples analysed	: 18

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



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ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.**



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD178	AMD179	AMD180	AMD181	AMD182
Client sampling date / time				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EB1315494-002	EB1315494-003	EB1315494-004	EB1315494-005	EB1315494-006
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.5	7.3	7.2	6.6	7.8
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	1.2	<0.5	1.5	1.8
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.3	-0.8	-3.0	-2.8	-7.2
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	22	86	33	119	107
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	1.6	2.0	3.0	4.3	9.0
ANC as CaCO3	----	0.1	% CaCO3	0.2	0.2	0.3	0.4	0.9
Fizz Rating	----	0	Fizz Unit	0	0	0	0	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.01	0.04	<0.01	0.05	0.06



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD183	AMD184	AMD185	AMD186	AMD187
Client sampling date / time				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EB1315494-007	EB1315494-008	EB1315494-009	EB1315494-010	EB1315494-011
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.5	8.8	9.3	5.2	8.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	5.8	3.1	2.4	18.0	8.6
Net Acid Production Potential	----	0.5	kg H2SO4/t	-2.6	-7.3	-16.0	-1.6	<0.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	111	226	291	239	253
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	8.4	10.4	18.5	19.7	8.4
ANC as CaCO3	----	0.1	% CaCO3	0.8	1.0	1.9	2.0	0.8
Fizz Rating	----	0	Fizz Unit	1	1	1	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.19	0.10	0.08	0.59	0.28



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD188	AMD189	AMD190	AMD191	AMD192
Client sampling date / time				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EB1315494-012	EB1315494-013	EB1315494-014	EB1315494-015	EB1315494-016
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.7	7.5	7.5	8.2	8.3
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	2.1	1.5	2.1	1.2	1.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.4	-5.7	-3.4	-7.0	-5.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	72	84	125	67	60
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	3.5	7.2	5.5	8.2	6.6
ANC as CaCO3	----	0.1	% CaCO3	0.4	0.7	0.6	0.8	0.7
Fizz Rating	----	0	Fizz Unit	0	1	0	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.07	0.05	0.07	0.04	0.05



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD193	AMD194	AMD177	----	----
Client sampling date / time				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	EB1315494-017	EB1315494-018	EB1315494-019	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.5	9.5	7.5	----	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	8.0	1.5	<0.5	----	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.3	-8.5	-1.8	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	207	189	40	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	9.3	10.0	1.8	----	----
ANC as CaCO3	----	0.1	% CaCO3	0.9	1.0	0.2	----	----
Fizz Rating	----	0	Fizz Unit	1	1	0	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.26	0.05	<0.01	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1316687	Page	: 1 of 8
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 12-JUL-2013
Sampler	: Ashley Tarr	Issue Date	: 26-JUL-2013
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 29
		No. of samples analysed	: 29

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



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Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.**



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD 195	AMD 196	AMD 197	AMD 198	AMD 199
				[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]
Compound	CAS Number	LOR	Unit	EB1316687-001	EB1316687-002	EB1316687-003	EB1316687-004	EB1316687-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.6	7.1	7.3	7.3	8.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	<0.5	1.2	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-0.9	<0.5	1.2	<0.5	-1.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	472	515	364	223	156
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	1.8	<0.5	<0.5	<0.5	1.4
ANC as CaCO3	----	0.1	% CaCO3	0.2	<0.1	<0.1	<0.1	0.1
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	<0.01	0.04	<0.01	0.01



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD 200	AMD 201	AMD 202	AMD 203	AMD 204
Client sampling date / time				[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]
Compound	CAS Number	LOR	Unit	EB1316687-006	EB1316687-007	EB1316687-008	EB1316687-009	EB1316687-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.0	8.1	8.8	9.0	9.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.8	1.8	0.9	1.2	1.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-5.9	-10.6	-11.7	-13.9	-50.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	801	821	475	446	417
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	7.7	12.4	12.6	15.1	52.4
ANC as CaCO3	----	0.1	% CaCO3	0.8	1.3	1.3	1.5	5.3
Fizz Rating	----	0	Fizz Unit	0	1	1	1	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.06	0.06	0.03	0.04	0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD 205	AMD 206	AMD 207	AMD 208	AMD 209
				[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]
Compound	CAS Number	LOR	Unit	EB1316687-011	EB1316687-012	EB1316687-013	EB1316687-014	EB1316687-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.0	9.0	8.7	9.1	8.4
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.2	1.2	1.5	1.2	4.3
Net Acid Production Potential	----	0.5	kg H2SO4/t	-52.4	-79.4	-7.1	-61.6	-2.6
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	404	493	227	415	228
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	53.6	80.6	8.6	62.8	6.9
ANC as CaCO3	----	0.1	% CaCO3	5.5	8.2	0.9	6.4	0.7
Fizz Rating	----	0	Fizz Unit	2	2	0	2	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.04	0.04	0.05	0.04	0.14



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD 210	AMD 211	AMD 212	AMD 213	AMD 214
Client sampling date / time				[09-JUL-2013]	[09-JUL-2013]	[09-JUL-2013]	[10-JUL-2013]	[10-JUL-2013]
Compound	CAS Number	LOR	Unit	EB1316687-016	EB1316687-017	EB1316687-018	EB1316687-019	EB1316687-020
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.3	9.4	8.4	7.5	8.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	0.9	1.8	4.9	1.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-11.2	-8.1	-1.6	1.6	-62.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	376	347	66	84	117
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	12.7	9.0	3.4	3.3	63.6
ANC as CaCO3	----	0.1	% CaCO3	1.3	0.9	0.3	0.3	6.5
Fizz Rating	----	0	Fizz Unit	1	0	0	0	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.03	0.06	0.16	0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD 215	AMD 216	AMD 217	AMD 218	AMD 219
Client sampling date / time				[10-JUL-2013]	[10-JUL-2013]	[10-JUL-2013]	[10-JUL-2013]	[10-JUL-2013]
Compound	CAS Number	LOR	Unit	EB1316687-021	EB1316687-022	EB1316687-023	EB1316687-024	EB1316687-025
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.0	8.2	9.2	7.7	8.8
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.8	1.5	0.9	1.8	0.9
Net Acid Production Potential	----	0.5	kg H2SO4/t	-14.2	-2.5	-60.3	<0.5	-60.3
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	215	69	173	135	473
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	16.0	4.0	61.2	1.6	61.2
ANC as CaCO3	----	0.1	% CaCO3	1.6	0.4	6.2	0.2	6.2
Fizz Rating	----	0	Fizz Unit	1	0	2	0	2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.06	0.05	0.03	0.06	0.03



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD 220	AMD 221	AMD 222	AMD 223	----
Client sampling date / time				[10-JUL-2013]	[10-JUL-2013]	[10-JUL-2013]	[10-JUL-2013]	----
Compound	CAS Number	LOR	Unit	EB1316687-026	EB1316687-027	EB1316687-028	EB1316687-029	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.1	8.4	8.4	8.6	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	8.9	6.4	3.1	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-0.6	1.7	-4.4	-1.3	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	79	325	362	170	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	1.5	7.2	10.8	4.4	----
ANC as CaCO3	----	0.1	% CaCO3	0.2	0.7	1.1	0.4	----
Fizz Rating	----	0	Fizz Unit	0	0	1	0	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	0.29	0.21	0.10	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1317305	Page	: 1 of 5
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 19-JUL-2013
Sampler	: T. Womack/A. Tarr	Issue Date	: 31-JUL-2013
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 13
		No. of samples analysed	: 13

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- Analytical Results



NATA Accredited Laboratory 825

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ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils



General Comments

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.**



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				Overburden AMD224	Overburden AMD225	Overburden AMD226	Overburden AMD227	Au2 RF AMD228
Client sampling date / time				11-JUL-2013 11:00	11-JUL-2013 11:00	11-JUL-2013 11:00	11-JUL-2013 11:00	11-JUL-2013 11:00
Compound	CAS Number	LOR	Unit	EB1317305-001	EB1317305-002	EB1317305-003	EB1317305-004	EB1317305-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.0	6.5	7.0	8.9	6.6
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	1.2	1.8	0.9	7.0
Net Acid Production Potential	----	0.5	kg H2SO4/t	0.9	1.2	1.2	-12.1	4.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	99	120	168	357	115
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	<0.5	<0.5	0.6	13.0	2.1
ANC as CaCO3	----	0.1	% CaCO3	<0.1	<0.1	<0.1	1.3	0.2
Fizz Rating	----	0	Fizz Unit	0	0	0	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	0.04	0.06	0.03	0.23



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				Au1 FL AMD229	AL5 RF AMD230	AL5 FL AMD231	AL1 FL/B3 RF AMD232	B1 FL AMD233
Client sampling date / time				11-JUL-2013 11:00	11-JUL-2013 11:00	11-JUL-2013 11:00	11-JUL-2013 11:00	11-JUL-2013 11:00
Compound	CAS Number	LOR	Unit	EB1317305-006	EB1317305-007	EB1317305-008	EB1317305-009	EB1317305-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.6	8.7	8.5	8.9	8.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	15.3	2.1	3.1	1.5	1.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	11.9	-23.0	-65.5	-53.4	-5.3
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	231	282	310	234	209
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	3.4	25.2	68.6	54.9	6.8
ANC as CaCO3	----	0.1	% CaCO3	0.3	2.6	7.0	5.6	0.7
Fizz Rating	----	0	Fizz Unit	0	1	2	2	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.50	0.07	0.10	0.05	0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				Overburden AMD234	Overburden AMD235	Overburden AMD236	----	----
				11-JUL-2013 11:00	11-JUL-2013 11:00	11-JUL-2013 11:00	----	----
Compound	CAS Number	LOR	Unit	EB1317305-011	EB1317305-012	EB1317305-013	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.7	7.8	8.8	----	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.8	1.8	0.9	----	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-12.9	-21.0	-10.9	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	126	99	135	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	14.7	22.8	11.8	----	----
ANC as CaCO3	----	0.1	% CaCO3	1.5	2.3	1.2	----	----
Fizz Rating	----	0	Fizz Unit	1	1	1	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.06	0.06	0.03	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1319308	Page	: 1 of 12
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 09-AUG-2013
Sampler	: Ashley Tarr	Issue Date	: 26-AUG-2013
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 47
		No. of samples analysed	: 46

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Stephen Hislop	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 12
Work Order : EB1319308
Client : RGS ENVIRONMENTAL PTY LTD
Project : Project Stone

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- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD237	AMD238	AMD239	AMD240	AMD281
Client sampling date / time				06-AUG-2013 11:00	06-AUG-2013 11:00	06-AUG-2013 11:00	06-AUG-2013 11:00	06-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-001	EB1319308-002	EB1319308-003	EB1319308-004	EB1319308-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.3	7.4	7.1	6.5	7.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	0.9	0.9	<0.5	1.2
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.8	<0.5	0.9	<0.5	0.7
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	59	93	71	118	76
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	2.1	0.6	<0.5	<0.5	0.5
ANC as CaCO3	----	0.1	% CaCO3	0.2	<0.1	<0.1	<0.1	<0.1
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.01	0.03	0.03	<0.01	0.04



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD282	AMD241	AMD242	AMD243	AMD244
Client sampling date / time				06-AUG-2013 11:00	06-AUG-2013 11:00	06-AUG-2013 11:00	06-AUG-2013 11:00	06-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-006	EB1319308-007	EB1319308-008	EB1319308-009	EB1319308-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.0	6.1	6.9	7.5	7.5
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.5	3.1	1.8	1.2	1.2
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.1	<0.5	<0.5	-1.3	-2.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	145	100	83	69	69
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	2.6	2.9	2.1	2.5	3.6
ANC as CaCO3	----	0.1	% CaCO3	0.3	0.3	0.2	0.2	0.4
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.05	0.10	0.06	0.04	0.04



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD245	AMD246	AMD247	AMD248	AMD249
Client sampling date / time				06-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-011	EB1319308-012	EB1319308-013	EB1319308-014	EB1319308-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.1	7.2	6.7	7.0	6.9
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.2	<0.5	<0.5	<0.5	0.9
Net Acid Production Potential	----	0.5	kg H2SO4/t	-3.4	-1.2	-0.9	<0.5	<0.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	112	14	22	17	26
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	4.6	1.2	0.9	<0.5	0.5
ANC as CaCO3	----	0.1	% CaCO3	0.5	0.1	<0.1	<0.1	<0.1
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.04	<0.01	<0.01	<0.01	0.03



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD250	AMD251	AMD252	AMD253	AMD254
Client sampling date / time				11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-016	EB1319308-017	EB1319308-018	EB1319308-019	EB1319308-020
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.0	7.3	7.7	8.0	8.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	<0.5	<0.5	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	<0.5	-0.9	-1.5	-1.4	-1.0
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	14	26	34	33	43
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	0.6	0.9	1.8	1.4	1.0
ANC as CaCO3	----	0.1	% CaCO3	<0.1	<0.1	0.2	0.1	0.1
Fizz Rating	----	0	Fizz Unit	0	0	0	0	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	<0.01	0.01	<0.01	<0.01



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD255	AMD256	AMD257	AMD258	AMD259
Client sampling date / time				11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-021	EB1319308-022	EB1319308-023	EB1319308-024	EB1319308-025
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.6	8.8	8.9	8.9	9.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	<0.5	0.9	<0.5	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-12.2	-53.4	-25.2	-27.2	-17.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	72	244	149	129	95
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	12.5	54.3	25.2	27.5	17.4
ANC as CaCO3	----	0.1	% CaCO3	1.3	5.5	2.6	2.8	1.8
Fizz Rating	----	0	Fizz Unit	0	2	1	2	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.01	0.03	<0.01	0.01	<0.01



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD260	AMD261	AMD262	AMD263	AMD264
Client sampling date / time				11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-026	EB1319308-027	EB1319308-028	EB1319308-029	EB1319308-030
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.0	8.8	8.9	9.0	9.0
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.2	1.2	0.9	<0.5	<0.5
Net Acid Production Potential	----	0.5	kg H2SO4/t	-15.0	-31.2	-16.0	-18.6	-15.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	190	235	147	188	98
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	16.2	32.4	16.9	18.9	15.9
ANC as CaCO3	----	0.1	% CaCO3	1.6	3.3	1.7	1.9	1.6
Fizz Rating	----	0	Fizz Unit	1	2	1	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.04	0.04	0.03	0.01	<0.01



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD265	AMD266	AMD267	AMD268	AMD269
Client sampling date / time				11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-031	EB1319308-032	EB1319308-033	EB1319308-034	EB1319308-035
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.8	7.6	8.5	9.0	9.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.2	2.1	1.5	2.4	1.2
Net Acid Production Potential	----	0.5	kg H2SO4/t	-12.4	-6.2	-7.6	-13.8	-8.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	150	272	157	293	299
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	13.6	8.4	9.1	16.2	9.3
ANC as CaCO3	----	0.1	% CaCO3	1.4	0.8	0.9	1.6	0.9
Fizz Rating	----	0	Fizz Unit	1	0	0	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.04	0.07	0.05	0.08	0.04



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD270	AMD271	AMD272	AMD273	AMD274
Client sampling date / time				11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-036	EB1319308-037	EB1319308-038	EB1319308-039	EB1319308-040
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.7	8.4	8.2	7.6	8.4
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	2.1	3.1	5.8	1.2
Net Acid Production Potential	----	0.5	kg H2SO4/t	-23.6	-29.8	-12.0	-5.9	-2.2
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	243	441	327	263	69
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	24.5	31.9	15.1	11.7	3.4
ANC as CaCO3	----	0.1	% CaCO3	2.5	3.2	1.5	1.2	0.3
Fizz Rating	----	0	Fizz Unit	1	2	1	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	0.07	0.10	0.19	0.04



Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)

Client sample ID

				AMD275	AMD276	AMD277	AMD278	AMD279
Client sampling date / time				11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00	11-AUG-2013 11:00
Compound	CAS Number	LOR	Unit	EB1319308-041	EB1319308-042	EB1319308-043	EB1319308-044	EB1319308-045
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.3	7.9	7.8	8.5	8.1
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	1.2	2.1	2.4	1.2	4.9
Net Acid Production Potential	----	0.5	kg H2SO4/t	-10.8	-2.6	-9.2	-245	-7.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	156	117	149	160	257
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	12.0	4.7	11.6	246	12.4
ANC as CaCO3	----	0.1	% CaCO3	1.2	0.5	1.2	25.1	1.3
Fizz Rating	----	0	Fizz Unit	1	0	1	3	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.04	0.07	0.08	0.04	0.16



Analytical Results

Sub-Matrix: **ROCK** (Matrix: **SOIL**)

Client sample ID

AMD280

Client sampling date / time

11-AUG-2013 11:00

Compound	CAS Number	LOR	Unit	EB1319308-046	----	----	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.0	----	----	----	----
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	----	----	----	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-20.9	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	246	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	21.8	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	2.2	----	----	----	----
Fizz Rating	----	0	Fizz Unit	1	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.03	----	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1320398	Page	: 1 of 5
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
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Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 23-AUG-2013
Sampler	: Ashley Tarr	Issue Date	: 29-AUG-2013
Site	: MacMines Project Stone		
Quote number	: BN/057/11 V2	No. of samples received	: 11
		No. of samples analysed	: 11

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Signatories

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Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 5
Work Order : EB1320398
Client : RGS ENVIRONMENTAL PTY LTD
Project : Project Stone

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD288 AL Roof	AMD289 AL Coal	AMD290 AL Floor	AMD291 D2 Roof	AMD292 D2 Coal
Client sampling date / time				[21-AUG-2013]	[21-AUG-2013]	[21-AUG-2013]	[21-AUG-2013]	[21-AUG-2013]
Compound	CAS Number	LOR	Unit	EB1320398-001	EB1320398-002	EB1320398-003	EB1320398-004	EB1320398-005
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.1	9.0	9.1	9.7	9.6
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	4.9	4.9	6.4	1.8	4.0
Net Acid Production Potential	----	0.5	kg H2SO4/t	-31.7	-35.3	-27.9	-12.3	-13.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	205	191	187	202	198
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	36.6	40.2	34.3	14.1	17.4
ANC as CaCO3	----	0.1	% CaCO3	3.7	4.1	3.5	1.4	1.8
Fizz Rating	----	0	Fizz Unit	2	2	2	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.16	0.16	0.21	0.06	0.13



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD293 D2/S1 Interburden	AMD294 D1 Coal	AMD295 D1 Floor	AMD284 Claystone	AMD286 Sandstone
Client sampling date / time				[21-AUG-2013]	[21-AUG-2013]	[21-AUG-2013]	[21-AUG-2013]	[21-AUG-2013]
Compound	CAS Number	LOR	Unit	EB1320398-006	EB1320398-007	EB1320398-008	EB1320398-009	EB1320398-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	9.6	9.8	9.8	9.4	8.3
EA009: Nett Acid Production Potential								
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	6.1	4.9	5.5	2.8	1.2
Net Acid Production Potential	----	0.5	kg H2SO4/t	-9.1	-18.3	-18.7	-14.9	-1.6
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	255	261	231	112	90
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	15.2	23.2	24.2	17.7	2.8
ANC as CaCO3	----	0.1	% CaCO3	1.6	2.4	2.5	1.8	0.3
Fizz Rating	----	0	Fizz Unit	1	1	1	1	0
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.20	0.16	0.18	0.09	0.04



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	AMD287 Claystone	----	----	----	----
				Client sampling date / time	[21-AUG-2013]	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1320398-011	----	----	----	----	----
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	8.9	----	----	----	----	----
EA009: Nett Acid Production Potential									
Acid Production Potential (APP)	----	0.5	kg H2SO4/t	0.9	----	----	----	----	----
Net Acid Production Potential	----	0.5	kg H2SO4/t	-61.5	----	----	----	----	----
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	95	----	----	----	----	----
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	62.4	----	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	6.4	----	----	----	----	----
Fizz Rating	----	0	Fizz Unit	2	----	----	----	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	0.03	----	----	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1230179	Page	: 1 of 10
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 15-NOV-2012
Sampler	: ----	Issue Date	: 06-DEC-2012
Site	: ----		
Quote number	: BN/057/11 V2	No. of samples received	: 47
		No. of samples analysed	: 22

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils



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Page : 3 of 10
 Work Order : EB1230179
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : Project Stone



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				AMD068 113.0-113.3 MC5003	AMD070 128.5-128.8 MC5003	AMD072 133.5-133.6 MC5003	AMD073 135.5-135.7 MC5003	AMD050 273.2-273.6 MC5006
Client sampling date / time				18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00
Compound	CAS Number	LOR	Unit	EB1230179-006	EB1230179-008	EB1230179-010	EB1230179-011	EB1230179-019
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.124	0.050	0.040	0.025	0.048

Page : 4 of 10
 Work Order : EB1230179
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : Project Stone



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				AMD051 274.4-274.7 MC5006	AMD055 286.3-286.6 MC5006	AMD014 187.2-187.5 MC5009	AMD018 191.7-192.1 MC5009	AMD027 239.6-239.9 MC5009
Client sampling date / time				18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00
Compound	CAS Number	LOR	Unit	EB1230179-020	EB1230179-021	EB1230179-027	EB1230179-029	EB1230179-035
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.158	0.016	0.006	0.035	0.153



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				Composite 1	Composite 2	Composite 3	Composite 4	Composite 5
				18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00
Compound	CAS Number	LOR	Unit	EB1230179-036	EB1230179-037	EB1230179-038	EB1230179-039	EB1230179-040
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	0.3	10.6	7.1	29.3	21.2
Exchangeable Magnesium	----	0.1	meq/100g	1.7	25.1	8.4	4.1	4.0
Exchangeable Potassium	----	0.1	meq/100g	0.4	0.3	0.3	0.4	0.9
Exchangeable Sodium	----	0.1	meq/100g	0.4	0.8	0.2	0.1	0.5
Cation Exchange Capacity	----	0.1	meq/100g	2.8	36.9	16.1	33.9	26.6
Exchangeable Sodium Percent	----	0.1	%	14.1	2.1	1.3	0.4	1.9
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	34	43	43	419	401
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	34	43	43	419	350
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	<1	<1	<1	<1	51
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	<10	120	200	140
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	130	<10	30	30	70
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	<10	<10	<10	120	20
Magnesium	7439-95-4	10	mg/kg	<10	<10	<10	30	<10
Sodium	7440-23-5	10	mg/kg	100	20	70	110	240
Potassium	7440-09-7	10	mg/kg	20	<10	20	60	40
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	250	280	190	200	620
Potassium	7440-09-7	50	mg/kg	350	250	420	660	1750
Calcium	7440-70-2	50	mg/kg	70	2490	2230	21800	7880
Magnesium	7439-95-4	50	mg/kg	300	3900	1900	2800	5570
EG005S : Soluble Metals by ICPAES								
Aluminium	7429-90-5	1	mg/kg	2	<1	<1	<1	<1
Antimony	7440-36-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	7440-38-2	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt	7440-48-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	7440-50-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				Composite 1	Composite 2	Composite 3	Composite 4	Composite 5
Client sampling date / time				18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00
Compound	CAS Number	LOR	Unit	EB1230179-036	EB1230179-037	EB1230179-038	EB1230179-039	EB1230179-040
EG005S : Soluble Metals by ICPAES - Continued								
Iron	7439-89-6	1	mg/kg	<1	<1	<1	<1	<1
Lead	7439-92-1	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	7439-98-7	0.1	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
Nickel	7440-02-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	7782-49-2	0.1	mg/kg	<0.1	<0.1	0.4	0.3	<0.1
Vanadium	7440-62-2	0.1	mg/kg	<0.1	<0.1	1.3	<0.1	<0.1
Zinc	7440-66-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus	7723-14-0	10	mg/kg	<10	<10	<10	<10	<10
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	2840	5060	4240	5020	15300
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	14	5	6	<5
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	37	<2	5	9	31
Cobalt	7440-48-4	2	mg/kg	<2	15	8	10	14
Copper	7440-50-8	5	mg/kg	5	18	42	30	34
Iron	7439-89-6	50	mg/kg	25300	30900	5560	29200	36000
Lead	7439-92-1	5	mg/kg	6	22	23	17	11
Manganese	7439-96-5	5	mg/kg	40	23	9	659	481
Molybdenum	7439-98-7	2	mg/kg	<2	<2	<2	<2	<2
Nickel	7440-02-0	2	mg/kg	<2	37	34	14	27
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	54	66	96	32	47
Zinc	7440-66-6	5	mg/kg	<5	109	49	73	70
Phosphorus	7723-14-0	50	mg/kg	50	420	80	380	460
EG020S: Soluble Metals by ICPMS								
Thorium	7440-29-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
EG020T: Total Metals by ICP-MS								
Thorium	7440-29-1	0.1	mg/kg	7.3	9.3	12.2	6.8	7.2
Uranium	7440-61-1	0.1	mg/kg	0.5	4.4	10.0	0.7	0.7



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				Composite 6	Composite 7	Composite 8	Composite 9	Composite 10
				18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00
Compound	CAS Number	LOR	Unit	EB1230179-041	EB1230179-042	EB1230179-043	EB1230179-044	EB1230179-045
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	25.4	24.2	31.7	4.4	33.1
Exchangeable Magnesium	----	0.1	meq/100g	1.8	2.2	1.0	12.1	3.5
Exchangeable Potassium	----	0.1	meq/100g	0.2	0.5	0.4	0.8	0.4
Exchangeable Sodium	----	0.1	meq/100g	0.2	1.6	1.2	2.8	1.8
Cation Exchange Capacity	----	0.1	meq/100g	27.7	28.6	34.3	20.1	38.8
Exchangeable Sodium Percent	----	0.1	%	0.9	5.6	3.4	13.7	4.6
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	436	624	572	128	777
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	419	590	521	128	760
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	17	34	51	<1	17
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	40	240	40	70	20
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	<10	<10	<10	110	<10
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	20	20	10	<10	40
Magnesium	7439-95-4	10	mg/kg	<10	<10	<10	<10	<10
Sodium	7440-23-5	10	mg/kg	200	370	250	130	360
Potassium	7440-09-7	10	mg/kg	20	20	20	<10	20
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	400	1200	830	1070	1020
Potassium	7440-09-7	50	mg/kg	560	640	1020	1780	300
Calcium	7440-70-2	50	mg/kg	28800	7500	20100	1990	9260
Magnesium	7439-95-4	50	mg/kg	1520	1960	2310	5300	1540
EG005S : Soluble Metals by ICPAES								
Aluminium	7429-90-5	1	mg/kg	<1	<1	<1	<1	<1
Antimony	7440-36-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	7440-38-2	0.1	mg/kg	0.2	<0.1	0.6	<0.1	<0.1
Boron	7440-42-8	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt	7440-48-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	7440-50-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				Composite 6	Composite 7	Composite 8	Composite 9	Composite 10
Client sampling date / time				18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00	18-OCT-2012 15:00
Compound	CAS Number	LOR	Unit	EB1230179-041	EB1230179-042	EB1230179-043	EB1230179-044	EB1230179-045
EG005S : Soluble Metals by ICPAES - Continued								
Iron	7439-89-6	1	mg/kg	<1	<1	<1	<1	<1
Lead	7439-92-1	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	7439-98-7	0.1	mg/kg	<0.1	0.6	0.7	<0.1	<0.1
Nickel	7440-02-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	7782-49-2	0.1	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Vanadium	7440-62-2	0.1	mg/kg	0.2	0.2	0.3	<0.1	0.3
Zinc	7440-66-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus	7723-14-0	10	mg/kg	<10	<10	<10	<10	<10
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	5450	5980	5040	12100	5330
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	6	9	<5	<5	<5
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	9	6	10	32	2
Cobalt	7440-48-4	2	mg/kg	7	14	9	14	<2
Copper	7440-50-8	5	mg/kg	44	68	40	24	33
Iron	7439-89-6	50	mg/kg	16200	32600	33500	34000	5740
Lead	7439-92-1	5	mg/kg	26	14	13	12	23
Manganese	7439-96-5	5	mg/kg	525	548	754	512	93
Molybdenum	7439-98-7	2	mg/kg	<2	<2	<2	<2	<2
Nickel	7440-02-0	2	mg/kg	10	19	12	26	<2
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	29	58	25	43	32
Zinc	7440-66-6	5	mg/kg	72	86	75	57	56
Phosphorus	7723-14-0	50	mg/kg	280	470	800	560	70
EG020S: Soluble Metals by ICPMS								
Thorium	7440-29-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
EG020T: Total Metals by ICP-MS								
Thorium	7440-29-1	0.1	mg/kg	13.5	6.1	6.2	6.1	11.0
Uranium	7440-61-1	0.1	mg/kg	1.5	0.7	0.7	0.8	1.7



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				Composite 11	Composite 12	----	----	----
				18-OCT-2012 15:00	18-OCT-2012 15:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1230179-046	EB1230179-047	----	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	11.6	33.8	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	1.1	0.8	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	0.3	0.3	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	1.6	1.6	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	14.6	36.6	----	----	----
Exchangeable Sodium Percent	----	0.1	%	10.7	4.5	----	----	----
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	239	632	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	239	512	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	<1	120	----	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	130	80	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	<10	<10	----	----	----
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	<10	<10	----	----	----
Magnesium	7439-95-4	10	mg/kg	<10	<10	----	----	----
Sodium	7440-23-5	10	mg/kg	190	300	----	----	----
Potassium	7440-09-7	10	mg/kg	<10	10	----	----	----
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	770	1070	----	----	----
Potassium	7440-09-7	50	mg/kg	550	590	----	----	----
Calcium	7440-70-2	50	mg/kg	3060	45900	----	----	----
Magnesium	7439-95-4	50	mg/kg	990	2820	----	----	----
EG005S : Soluble Metals by ICPAES								
Aluminium	7429-90-5	1	mg/kg	<1	<1	----	----	----
Antimony	7440-36-0	0.1	mg/kg	<0.1	<0.1	----	----	----
Arsenic	7440-38-2	0.1	mg/kg	<0.1	0.9	----	----	----
Boron	7440-42-8	1	mg/kg	<1	<1	----	----	----
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	----	----	----
Chromium	7440-47-3	0.1	mg/kg	<0.1	<0.1	----	----	----
Cobalt	7440-48-4	0.1	mg/kg	<0.1	<0.1	----	----	----
Copper	7440-50-8	0.1	mg/kg	<0.1	<0.1	----	----	----



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				Composite 11	Composite 12	----	----	----
Client sampling date / time				18-OCT-2012 15:00	18-OCT-2012 15:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1230179-046	EB1230179-047	----	----	----
EG005S : Soluble Metals by ICPAES - Continued								
Iron	7439-89-6	1	mg/kg	<1	<1	----	----	----
Lead	7439-92-1	0.1	mg/kg	<0.1	<0.1	----	----	----
Manganese	7439-96-5	0.1	mg/kg	<0.1	<0.1	----	----	----
Molybdenum	7439-98-7	0.1	mg/kg	0.2	0.9	----	----	----
Nickel	7440-02-0	0.1	mg/kg	<0.1	<0.1	----	----	----
Selenium	7782-49-2	0.1	mg/kg	0.1	0.1	----	----	----
Vanadium	7440-62-2	0.1	mg/kg	0.4	0.6	----	----	----
Zinc	7440-66-6	0.1	mg/kg	<0.1	<0.1	----	----	----
Phosphorus	7723-14-0	10	mg/kg	<10	<10	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	5120	7240	----	----	----
Antimony	7440-36-0	5	mg/kg	<5	<5	----	----	----
Arsenic	7440-38-2	5	mg/kg	5	8	----	----	----
Boron	7440-42-8	50	mg/kg	<50	<50	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	4	20	----	----	----
Cobalt	7440-48-4	2	mg/kg	5	15	----	----	----
Copper	7440-50-8	5	mg/kg	78	16	----	----	----
Iron	7439-89-6	50	mg/kg	5420	13400	----	----	----
Lead	7439-92-1	5	mg/kg	22	7	----	----	----
Manganese	7439-96-5	5	mg/kg	36	533	----	----	----
Molybdenum	7439-98-7	2	mg/kg	<2	<2	----	----	----
Nickel	7440-02-0	2	mg/kg	6	20	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Vanadium	7440-62-2	5	mg/kg	52	33	----	----	----
Zinc	7440-66-6	5	mg/kg	120	60	----	----	----
Phosphorus	7723-14-0	50	mg/kg	100	600	----	----	----
EG020S: Soluble Metals by ICPMS								
Thorium	7440-29-1	0.01	mg/kg	<0.01	<0.01	----	----	----
Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	----	----	----
EG020T: Total Metals by ICP-MS								
Thorium	7440-29-1	0.1	mg/kg	7.9	3.5	----	----	----
Uranium	7440-61-1	0.1	mg/kg	0.7	0.3	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1233428	Page	: 1 of 3
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 21-DEC-2012
Sampler	: Alan Robertson	Issue Date	: 04-JAN-2013
Site	: ----		
Quote number	: BN/057/11 V2	No. of samples received	: 2
		No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)				Client sample ID	AMD008 Roof AU2	AMD095 C4 Roof	----	----	----
				Client sampling date / time	26-NOV-2012 07:00	26-NOV-2012 07:00	----	----	----
Compound	CAS Number	LOR	Unit		EB1233428-001	EB1233428-002	----	----	----
EA026 : Chromium Reducible Sulfur									
Chromium Reducible Sulphur	----	0.005	%		0.015	0.029	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1324465	Page	: 1 of 10
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: MacMines Project Stone	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 18-SEP-2013
C-O-C number	: ----	Issue Date	: 24-OCT-2013
Sampler	: Ashley Tarr	No. of samples received	: 62
Site	: ----	No. of samples analysed	: 28
Quote number	: BN/606/13		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils



Page : 2 of 10
Work Order : EB1324465
Client : RGS ENVIRONMENTAL PTY LTD
Project : MacMines Project Stone

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Page : 3 of 10
 Work Order : EB1324465
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : MacMines Project Stone



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				AMD183 EB1315494-007	AMD186 EB1315494-010	AMD187 EB1315494-011	AMD193 EB1315494-017	AMD 209 EB1316687-015
Client sampling date / time				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	09-JUL-2013 11:00
Compound	CAS Number	LOR	Unit	EB1324465-029	EB1324465-030	EB1324465-031	EB1324465-032	EB1324465-037
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.074	0.392	0.017	0.121	0.006



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

Client sampling date / time

				AMD 213 EB1316687-019	AMD 221 EB1316687-027	AMD 222 EB1316687-028	AMD228 EB1317305-005	AMD229 EB1317305-006
				10-JUL-2013 11:00	10-JUL-2013 11:00	10-JUL-2013 11:00	11-JUL-2013 11:00	11-JUL-2013 11:00
Compound	CAS Number	LOR	Unit	EB1324465-038	EB1324465-039	EB1324465-040	EB1324465-041	EB1324465-042
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.006	0.155	0.065	0.030	0.206



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				13 COMPOSITE	14 COMPOSITE	15 COMPOSITE	16 COMPOSITE	17 COMPOSITE
Client sampling date / time				[26-NOV-2013]	[14-MAY-2013]	[29-MAY-2013]	[31-MAY-2013]	[05-JUN-2013]
Compound	CAS Number	LOR	Unit	EB1324465-053	EB1324465-054	EB1324465-055	EB1324465-056	EB1324465-057
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.8	11.2	8.2	8.8	8.1
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	269	1110	188	204	218
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	481	893	206	369	309
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	412	<1	206	300	309
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	69	378	<1	69	<1
ED038A: Acidity								
Acidity	----	1	mg/kg	<1	<1	40	<1	16
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	160	1710	180	130	70
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	40	60	20	<10	110
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	20	950	30	30	20
Magnesium	7439-95-4	10	mg/kg	<10	<10	10	<10	20
Sodium	7440-23-5	10	mg/kg	180	150	110	160	140
Potassium	7440-09-7	10	mg/kg	80	50	20	20	20
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	510	320	250	450	280
Potassium	7440-09-7	50	mg/kg	2150	540	530	810	870
Calcium	7440-70-2	50	mg/kg	13900	18200	2790	73200	1360
Magnesium	7439-95-4	50	mg/kg	6460	400	1150	3400	1340
EG005S : Soluble Metals by ICPAES								
Aluminium	7429-90-5	1	mg/kg	<1	3	<1	<1	<1
Antimony	7440-36-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	7440-38-2	0.1	mg/kg	<0.1	<0.1	0.1	0.2	<0.1
Boron	7440-42-8	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	0.1	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Cobalt	7440-48-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	7440-50-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Iron	7439-89-6	1	mg/kg	<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				13 COMPOSITE	14 COMPOSITE	15 COMPOSITE	16 COMPOSITE	17 COMPOSITE
				[26-NOV-2013]	[14-MAY-2013]	[29-MAY-2013]	[31-MAY-2013]	[05-JUN-2013]
Compound	CAS Number	LOR	Unit	EB1324465-053	EB1324465-054	EB1324465-055	EB1324465-056	EB1324465-057
EG005S : Soluble Metals by ICPAES - Continued								
Lead	7439-92-1	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.1	mg/kg	0.1	<0.1	<0.1	<0.1	0.2
Molybdenum	7439-98-7	0.1	mg/kg	<0.1	0.2	<0.1	0.2	<0.1
Nickel	7440-02-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	7782-49-2	0.1	mg/kg	<0.1	<0.1	0.3	<0.1	0.1
Vanadium	7440-62-2	0.1	mg/kg	0.1	0.8	0.1	<0.1	<0.1
Zinc	7440-66-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus	7723-14-0	10	mg/kg	<10	<10	<10	<10	<10
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	18700	5190	8010	7320	5230
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	6	8	6	<5
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	39	39	9	24	26
Cobalt	7440-48-4	2	mg/kg	17	<2	6	14	8
Copper	7440-50-8	5	mg/kg	47	22	64	19	17
Iron	7439-89-6	50	mg/kg	39800	12700	17200	20600	28600
Lead	7439-92-1	5	mg/kg	15	8	45	9	7
Manganese	7439-96-5	5	mg/kg	925	50	194	2360	267
Molybdenum	7439-98-7	2	mg/kg	<2	<2	<2	<2	<2
Nickel	7440-02-0	2	mg/kg	33	4	9	15	14
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	61	44	41	31	43
Zinc	7440-66-6	5	mg/kg	74	11	68	63	28
Phosphorus	7723-14-0	50	mg/kg	510	70	420	590	240
EG020S: Soluble Metals by ICPMS								
Thorium	7440-29-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
EG020T: Total Metals by ICP-MS								
Thorium	7440-29-1	0.1	mg/kg	7.3	6.3	22.7	4.3	3.5
Uranium	7440-61-1	0.1	mg/kg	0.7	1.4	3.0	0.4	0.6



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				18 COMPOSITE	19 COMPOSITE	20 COMPOSITE	21 COMPOSITE	22 COMPOSITE
Client sampling date / time				[25-JUN-2013]	[09-JUL-2013]	[11-JUL-2013]	[11-AUG-2013]	[11-AUG-2013]
Compound	CAS Number	LOR	Unit	EB1324465-058	EB1324465-059	EB1324465-060	EB1324465-061	EB1324465-062
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	7.2	7.7	8.5	6.6	8.9
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	115	311	107	24	134
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	103	69	232	43	283
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	103	69	215	43	214
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	<1	<1	17	<1	69
ED038A: Acidity								
Acidity	----	1	mg/kg	96	16	<1	40	<1
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	120	410	50	<10	20
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	20	130	20	10	20
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	<10	40	<10	<10	<10
Magnesium	7439-95-4	10	mg/kg	<10	20	<10	<10	<10
Sodium	7440-23-5	10	mg/kg	80	170	90	20	120
Potassium	7440-09-7	10	mg/kg	20	90	<10	<10	<10
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	320	350	460	190	800
Potassium	7440-09-7	50	mg/kg	1060	1380	1350	190	2060
Calcium	7440-70-2	50	mg/kg	2600	1140	12800	<50	5060
Magnesium	7439-95-4	50	mg/kg	1520	1670	6360	380	7260
EG005S : Soluble Metals by ICPAES								
Aluminium	7429-90-5	1	mg/kg	<1	<1	<1	2	2
Antimony	7440-36-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	7440-38-2	0.1	mg/kg	<0.1	<0.1	0.6	<0.1	<0.1
Boron	7440-42-8	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	7440-47-3	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt	7440-48-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	7440-50-8	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Iron	7439-89-6	1	mg/kg	<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				18 COMPOSITE	19 COMPOSITE	20 COMPOSITE	21 COMPOSITE	22 COMPOSITE
Client sampling date / time				[25-JUN-2013]	[09-JUL-2013]	[11-JUL-2013]	[11-AUG-2013]	[11-AUG-2013]
Compound	CAS Number	LOR	Unit	EB1324465-058	EB1324465-059	EB1324465-060	EB1324465-061	EB1324465-062
EG005S : Soluble Metals by ICPAES - Continued								
Lead	7439-92-1	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.1	mg/kg	0.1	<0.1	<0.1	0.1	<0.1
Molybdenum	7439-98-7	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	7440-02-0	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	7782-49-2	0.1	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Zinc	7440-66-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus	7723-14-0	10	mg/kg	<10	<10	<10	<10	<10
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	10800	6220	14200	4340	22600
Antimony	7440-36-0	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	9	<5	14	<5	<5
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	12	36	22	40	25
Cobalt	7440-48-4	2	mg/kg	14	17	20	<2	21
Copper	7440-50-8	5	mg/kg	44	24	28	<5	51
Iron	7439-89-6	50	mg/kg	56900	24200	68300	18100	50900
Lead	7439-92-1	5	mg/kg	23	16	17	7	15
Manganese	7439-96-5	5	mg/kg	1260	745	992	27	407
Molybdenum	7439-98-7	2	mg/kg	<2	<2	<2	<2	<2
Nickel	7440-02-0	2	mg/kg	25	19	29	2	41
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	41	45	51	47	52
Zinc	7440-66-6	5	mg/kg	82	42	78	<5	89
Phosphorus	7723-14-0	50	mg/kg	660	190	2840	<50	390
EG020S: Soluble Metals by ICPMS								
Thorium	7440-29-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
EG020T: Total Metals by ICP-MS								
Thorium	7440-29-1	0.1	mg/kg	11.8	7.8	6.4	7.5	8.5
Uranium	7440-61-1	0.1	mg/kg	1.5	1.3	1.0	0.3	0.7

Page : 9 of 10
 Work Order : EB1324465
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : MacMines Project Stone



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				AMD110 EB1312454-008	AMD127 EB1313278-014	AMD128 EB1313278-015	AMD129 EB1313278-016	AMD131 EB1313278-018
Client sampling date / time				14-MAY-2013 11:00	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15	29-MAY-2013 07:15
Compound	CAS Number	LOR	Unit	EB1324465-009	EB1324465-012	EB1324465-013	EB1324465-014	EB1324465-015
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.062	0.006	0.029	0.018	0.014



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

				Client sample ID				
				Client sampling date / time				
Compound	CAS Number	LOR	Unit					
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%					

CERTIFICATE OF ANALYSIS

Work Order	: EB1329631	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 28-NOV-2013
Sampler	: ----	Issue Date	: 16-DEC-2013
Site	: ----		
Quote number	: BN/606/13	No. of samples received	: 10
		No. of samples analysed	: 10

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



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Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1329631
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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Page : 3 of 4
 Work Order : EB1329631
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				13 EB1324465-053	14 EB1324465-054	15 EB1324465-055	16 EB1324465-056	17 EB1324465-057
Client sampling date / time				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1329631-001	EB1329631-002	EB1329631-003	EB1329631-004	EB1329631-005
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	21.9	54.0	5.9	29.1	3.9
Exchangeable Magnesium	----	0.1	meq/100g	5.2	1.3	3.0	0.9	3.4
Exchangeable Potassium	----	0.1	meq/100g	1.0	0.3	0.2	0.2	0.2
Exchangeable Sodium	----	0.1	meq/100g	0.2	0.2	0.1	0.2	0.1
Cation Exchange Capacity	----	0.1	meq/100g	28.3	55.8	9.3	30.4	7.7
Exchangeable Sodium Percent	----	0.1	%	0.8	0.4	1.1	0.7	1.6



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)

Client sample ID

				18 EB1324465-058	19 EB1324465-059	20 EB1324465-060	21 EB1324465-061	22 EB1324465-062
Client sampling date / time				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	EB1329631-006	EB1329631-007	EB1329631-008	EB1329631-009	EB1329631-010
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	4.0	2.8	5.4	0.1	16.7
Exchangeable Magnesium	----	0.1	meq/100g	4.5	2.2	3.5	1.9	3.9
Exchangeable Potassium	----	0.1	meq/100g	0.4	0.4	0.4	<0.1	0.6
Exchangeable Sodium	----	0.1	meq/100g	0.2	<0.1	0.4	0.2	1.4
Cation Exchange Capacity	----	0.1	meq/100g	9.2	5.5	9.7	2.4	22.6
Exchangeable Sodium Percent	----	0.1	%	2.4	1.1	4.5	9.9	6.1

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1219839	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 -Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 27-JUL-2012
Sampler	: Mandie Matheson	Issue Date	: 03-AUG-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

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Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1219839
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 -Project Stone

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- EG020-F (Dissolved Metals): LOR raised for samples EB1219839-003 (Project Stone KLC 3), -004 (Project Stone KLC 4) due to matrix interference.



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
Client sampling date / time				27-JUL-2012 15:00	27-JUL-2012 15:00	27-JUL-2012 15:00	27-JUL-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1219839-001	EB1219839-002	EB1219839-003	EB1219839-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.32	7.55	6.03	7.07	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	161	492	2160	1170	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	26	64	28	43	----
Total Alkalinity as CaCO ₃	----	1	mg/L	26	64	28	43	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	2	24	3	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	46	113	809	108	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	2	6	374	360	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	13	14	159	72	----
Magnesium	7439-95-4	1	mg/L	1	2	30	21	----
Sodium	7440-23-5	1	mg/L	15	85	252	103	----
Potassium	7440-09-7	1	mg/L	<1	3	12	20	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.020	0.015	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0007	0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.002	0.006	0.001	0.002	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.021	0.002	----
Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	0.015	0.003	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	0.006	0.110	0.007	----
Manganese	7439-96-5	0.001	mg/L	0.066	0.044	0.785	0.045	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.012	<0.001	0.002	----
Selenium	7782-49-2	0.01	mg/L	<0.01	0.05	0.17	0.16	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Boron	7440-42-8	0.05	mg/L	0.08	0.28	0.26	0.24	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
				27-JUL-2012 15:00	27-JUL-2012 15:00	27-JUL-2012 15:00	27-JUL-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1219839-001	EB1219839-002	EB1219839-003	EB1219839-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	6.94	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	1.06	1.80	0.10	0.09	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1221260	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 10-AUG-2012
Sampler	: Mandie Matheson	Issue Date	: 23-AUG-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

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Signatories

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Signatories	Position	Accreditation Category
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1221260
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

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LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
Client sampling date / time				10-AUG-2012 15:00	10-AUG-2012 15:00	10-AUG-2012 15:00	10-AUG-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1221260-001	EB1221260-002	EB1221260-003	EB1221260-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.89	7.03	6.67	6.65	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	147	270	1730	483	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	9	16	12	6	----
Total Alkalinity as CaCO ₃	----	1	mg/L	9	16	12	6	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	3	3	3	2	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	46	101	395	34	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	2	4	408	139	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	5	5	152	26	----
Magnesium	7439-95-4	1	mg/L	<1	<1	24	8	----
Sodium	7440-23-5	1	mg/L	21	46	179	42	----
Potassium	7440-09-7	1	mg/L	<1	1	9	8	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	<0.01	<0.01	<0.01	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.024	0.006	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.006	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.015	0.012	0.297	0.020	----
Molybdenum	7439-98-7	0.001	mg/L	0.002	0.010	0.004	0.003	----
Selenium	7782-49-2	0.01	mg/L	0.03	0.05	0.20	0.09	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Boron	7440-42-8	0.05	mg/L	0.08	0.18	0.11	0.10	----

Page : 4 of 4
 Work Order : EB1221260
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
				10-AUG-2012 15:00	10-AUG-2012 15:00	10-AUG-2012 15:00	10-AUG-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1221260-001	EB1221260-002	EB1221260-003	EB1221260-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.20	0.08	0.02	<0.01	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1222376	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 23-AUG-2012
Sampler	: Mandie Matheson	Issue Date	: 03-SEP-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

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Signatories

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Signatories	Position	Accreditation Category
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1222376
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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LOR = Limit of reporting

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- EG020-F (Dissolved Metals): LOR raised for samples EB1222376-001 (Project Stone KLC 1) due to matrix interference.



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
Client sampling date / time				23-AUG-2012 15:00	23-AUG-2012 15:00	23-AUG-2012 15:00	23-AUG-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1222376-001	EB1222376-002	EB1222376-003	EB1222376-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.93	6.83	6.59	6.44	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	129	238	1580	428	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	11	16	10	4	----
Total Alkalinity as CaCO3	----	1	mg/L	11	16	10	4	----
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	3	2	3	3	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	42	86	440	42	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	2	4	274	106	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	3	4	137	22	----
Magnesium	7439-95-4	1	mg/L	<1	<1	22	7	----
Sodium	7440-23-5	1	mg/L	21	42	163	40	----
Potassium	7440-09-7	1	mg/L	<1	2	11	10	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.05	0.03	<0.01	<0.01	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.017	0.006	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.005	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	0.001	0.002	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.007	0.009	0.285	0.026	----
Molybdenum	7439-98-7	0.001	mg/L	0.002	0.010	0.005	0.004	----
Selenium	7782-49-2	0.01	mg/L	0.03	0.05	0.17	0.09	----
Vanadium	7440-62-2	0.01	mg/L	<0.05	<0.01	<0.01	<0.01	----
Boron	7440-42-8	0.05	mg/L	0.15	0.23	0.15	0.14	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
				23-AUG-2012 15:00	23-AUG-2012 15:00	23-AUG-2012 15:00	23-AUG-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1222376-001	EB1222376-002	EB1222376-003	EB1222376-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.67	0.12	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser								
Filtered Total Phosphorus as P	----	0.01	mg/L	<0.01	0.01	<0.01	<0.01	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1223753	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 101147		
C-O-C number	: ----	Date Samples Received	: 07-SEP-2012
Sampler	: Mandie Matheson	Issue Date	: 21-SEP-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1223753
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LIQUID (Matrix: WATER)

Client sample ID

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
Client sampling date / time				[07-SEP-2012]	[07-SEP-2012]	[07-SEP-2012]	[07-SEP-2012]	----
Compound	CAS Number	LOR	Unit	EB1223753-001	EB1223753-002	EB1223753-003	EB1223753-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.08	7.36	7.16	7.00	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	169	218	1280	447	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	6	13	11	7	----
Total Alkalinity as CaCO ₃	----	1	mg/L	6	13	11	7	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	3	3	3	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	59	69	462	95	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	3	7	144	94	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	4	4	120	23	----
Magnesium	7439-95-4	1	mg/L	<1	<1	18	7	----
Sodium	7440-23-5	1	mg/L	26	38	121	44	----
Potassium	7440-09-7	1	mg/L	<1	1	8	9	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.03	0.06	<0.01	<0.01	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.014	0.008	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.003	0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.004	0.007	0.210	0.046	----
Molybdenum	7439-98-7	0.001	mg/L	0.002	0.008	0.004	0.005	----
Selenium	7782-49-2	0.01	mg/L	0.03	0.04	0.11	0.08	----

Page : 4 of 4
 Work Order : EB1223753
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: LIQUID (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
				[07-SEP-2012]	[07-SEP-2012]	[07-SEP-2012]	[07-SEP-2012]	----
Compound	CAS Number	LOR	Unit	EB1223753-001	EB1223753-002	EB1223753-003	EB1223753-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	<0.01	0.01	<0.01	<0.01	----
Boron	7440-42-8	0.05	mg/L	0.15	0.27	0.16	0.22	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.22	0.08	<0.01	0.02	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1225114	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 21-SEP-2012
Sampler	: Mandie Matheson	Issue Date	: 27-SEP-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1225114
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
Client sampling date / time				21-SEP-2012 15:00	21-SEP-2012 15:00	21-SEP-2012 15:00	21-SEP-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1225114-001	EB1225114-002	EB1225114-003	EB1225114-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.95	7.35	7.13	7.00	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	138	173	1040	273	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	6	14	11	7	----
Total Alkalinity as CaCO ₃	----	1	mg/L	6	14	11	7	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	2	3	3	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	41	46	359	44	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	2	3	59	41	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	3	3	99	13	----
Magnesium	7439-95-4	1	mg/L	<1	<1	15	4	----
Sodium	7440-23-5	1	mg/L	23	31	93	29	----
Potassium	7440-09-7	1	mg/L	<1	1	8	8	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.06	0.30	<0.01	0.02	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	0.001	0.002	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.002	0.006	0.200	0.030	----
Molybdenum	7439-98-7	0.001	mg/L	0.002	0.009	0.004	0.005	----
Selenium	7782-49-2	0.01	mg/L	0.02	0.02	0.04	0.03	----

Page : 4 of 4
 Work Order : EB1225114
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
				21-SEP-2012 15:00	21-SEP-2012 15:00	21-SEP-2012 15:00	21-SEP-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1225114-001	EB1225114-002	EB1225114-003	EB1225114-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	<0.01	0.02	<0.01	<0.01	----
Boron	7440-42-8	0.05	mg/L	0.17	0.26	0.17	0.20	----
Iron	7439-89-6	0.05	mg/L	<0.05	0.07	<0.05	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.10	0.07	0.05	0.03	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1225944	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 05-OCT-2012
Sampler	: Mandie Matheson	Issue Date	: 12-OCT-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1225944
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KCL 1	Project Stone KCL 2	Project Stone KCL 3	Project Stone KCL 4	----
Client sampling date / time				05-OCT-2012 10:00	05-OCT-2012 10:00	05-OCT-2012 10:00	05-OCT-2012 10:00	----
Compound	CAS Number	LOR	Unit	EB1225944-001	EB1225944-002	EB1225944-003	EB1225944-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.17	7.57	7.38	7.29	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	136	168	1320	307	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	7	16	15	11	----
Total Alkalinity as CaCO ₃	----	1	mg/L	7	16	15	11	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	2	2	2	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	36	37	612	65	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	2	3	53	41	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	3	3	150	15	----
Magnesium	7439-95-4	1	mg/L	<1	<1	21	4	----
Sodium	7440-23-5	1	mg/L	21	28	105	28	----
Potassium	7440-09-7	1	mg/L	<1	<1	7	6	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.07	0.13	<0.01	0.02	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Arsenic	7440-38-2	0.001	mg/L	0.002	<0.001	0.003	0.003	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.001	<0.001	0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	<0.001	0.005	0.246	0.050	----
Molybdenum	7439-98-7	0.001	mg/L	0.002	0.007	0.004	0.005	----
Selenium	7782-49-2	0.01	mg/L	0.02	0.02	0.11	0.09	----

Page : 4 of 4
 Work Order : EB1225944
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KCL 1	Project Stone KCL 2	Project Stone KCL 3	Project Stone KCL 4	----
				05-OCT-2012 10:00	05-OCT-2012 10:00	05-OCT-2012 10:00	05-OCT-2012 10:00	----
Compound	CAS Number	LOR	Unit	EB1225944-001	EB1225944-002	EB1225944-003	EB1225944-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	<0.01	0.02	<0.01	<0.01	----
Boron	7440-42-8	0.05	mg/L	0.17	0.21	0.15	0.19	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.15	0.07	<0.01	0.03	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1227323	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 101147		
C-O-C number	: ----	Date Samples Received	: 19-OCT-2012
Sampler	: Mandie Matheson	Issue Date	: 25-OCT-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1227323
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
Client sampling date / time				[19-OCT-2012]	[19-OCT-2012]	[19-OCT-2012]	[19-OCT-2012]	----
Compound	CAS Number	LOR	Unit	EB1227323-001	EB1227323-002	EB1227323-003	EB1227323-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.03	7.44	7.05	7.23	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	90	136	755	170	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	6	16	9	11	----
Total Alkalinity as CaCO ₃	----	1	mg/L	6	16	9	11	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	2	2	2	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	28	37	305	37	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	1	2	31	30	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	2	2	87	8	----
Magnesium	7439-95-4	1	mg/L	<1	<1	12	2	----
Sodium	7440-23-5	1	mg/L	15	25	53	19	----
Potassium	7440-09-7	1	mg/L	<1	<1	6	5	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.13	0.46	<0.01	0.12	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.004	0.004	0.193	0.025	----
Molybdenum	7439-98-7	0.001	mg/L	0.002	0.007	0.003	0.005	----
Selenium	7782-49-2	0.01	mg/L	<0.01	0.02	0.02	0.02	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 1	Project Stone KLC 2	Project Stone KLC 3	Project Stone KLC 4	----
				[19-OCT-2012]	[19-OCT-2012]	[19-OCT-2012]	[19-OCT-2012]	----
Compound	CAS Number	LOR	Unit	EB1227323-001	EB1227323-002	EB1227323-003	EB1227323-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	<0.01	0.03	<0.01	<0.01	----
Boron	7440-42-8	0.05	mg/L	0.13	0.19	0.11	0.15	----
Iron	7439-89-6	0.05	mg/L	<0.05	0.06	<0.05	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.13	0.11	0.04	0.03	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1230507	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 22-NOV-2012
Sampler	: Mandie Matheson	Issue Date	: 28-NOV-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1230507
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- Ionic Balance out of acceptable limits for sample EB1230507-004 (Project Stone KLC 8) due to analytes not quantified in this report.

Page : 3 of 4
 Work Order : EB1230507
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: LIQUID (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				22-NOV-2012 15:00	22-NOV-2012 15:00	22-NOV-2012 15:00	22-NOV-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1230507-001	EB1230507-002	EB1230507-003	EB1230507-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.07	5.28	8.93	9.48	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	392	151	306	453	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	21	59	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	64	3	100	83	----
Total Alkalinity as CaCO ₃	----	1	mg/L	64	3	120	141	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	2	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	84	54	17	82	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	21	<1	8	10	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	26	10	3	2	----
Magnesium	7439-95-4	1	mg/L	6	4	<1	<1	----
Sodium	7440-23-5	1	mg/L	37	1	63	88	----
Potassium	7440-09-7	1	mg/L	9	5	2	2	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.02	<0.01	0.21	0.17	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	0.002	0.003	----
Arsenic	7440-38-2	0.001	mg/L	0.007	<0.001	0.004	0.353	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0006	<0.0001	0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.002	0.007	<0.001	0.001	----
Cobalt	7440-48-4	0.001	mg/L	0.001	0.038	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	0.002	0.174	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	0.018	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	0.240	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.010	0.115	<0.001	<0.001	----
Molybdenum	7439-98-7	0.001	mg/L	0.078	<0.001	0.059	1.20	----
Selenium	7782-49-2	0.01	mg/L	0.10	0.04	0.04	0.02	----

Page : 4 of 4
 Work Order : EB1230507
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: LIQUID (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
				22-NOV-2012 15:00	22-NOV-2012 15:00	22-NOV-2012 15:00	22-NOV-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1230507-001	EB1230507-002	EB1230507-003	EB1230507-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.07	0.15	----
Boron	7440-42-8	0.05	mg/L	0.08	<0.05	0.10	0.08	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.07	0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.32	0.02	0.02	0.26	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	3.62	1.18	2.98	4.81	----
Total Cations	----	0.01	meq/L	3.63	1.00	2.94	3.98	----
Ionic Balance	----	0.01	%	0.15	----	----	9.48	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1231978	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 06-DEC-2012
Sampler	: Mandie Matheson	Issue Date	: 17-DEC-2012
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1231978
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				06-DEC-2012 15:00	06-DEC-2012 15:00	06-DEC-2012 15:00	06-DEC-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1231978-001	EB1231978-002	EB1231978-003	EB1231978-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.91	8.65	8.70	8.76	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	403	121	340	634	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	6	16	23	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	38	34	102	130	----
Total Alkalinity as CaCO ₃	----	1	mg/L	38	40	118	153	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	<1	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	115	14	42	147	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	16	2	8	5	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	23	4	3	4	----
Magnesium	7439-95-4	1	mg/L	7	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	37	20	72	140	----
Potassium	7440-09-7	1	mg/L	14	1	3	3	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.02	0.62	0.61	0.01	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	0.003	0.002	----
Arsenic	7440-38-2	0.001	mg/L	0.007	0.019	0.006	0.329	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.001	0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.015	0.009	0.002	0.001	----
Molybdenum	7439-98-7	0.001	mg/L	0.065	0.019	0.072	0.929	----
Selenium	7782-49-2	0.01	mg/L	0.12	0.02	0.07	0.02	----

Page : 4 of 4
 Work Order : EB1231978
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				06-DEC-2012 15:00	06-DEC-2012 15:00	06-DEC-2012 15:00	06-DEC-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1231978-001	EB1231978-002	EB1231978-003	EB1231978-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	0.01	0.02	0.15	0.08	----
Boron	7440-42-8	0.05	mg/L	0.10	<0.05	0.16	0.07	----
Iron	7439-89-6	0.05	mg/L	<0.05	0.08	0.16	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.06	0.13	0.02	0.39	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	3.60	1.15	3.46	6.26	----
Total Cations	----	0.01	meq/L	3.69	1.10	3.36	6.37	----
Ionic Balance	----	0.01	%	1.19	----	1.52	0.79	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1233396	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 111207 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 21-DEC-2012
Sampler	: Mandie Matheson	Issue Date	: 04-JAN-2013
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1233396
Client : RGS ENVIRONMENTAL PTY LTD
Project : 111207 Project Stone

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				21-DEC-2012 15:00	21-DEC-2012 15:00	21-DEC-2012 15:00	21-DEC-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1233396-001	EB1233396-002	EB1233396-003	EB1233396-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.68	8.80	8.67	8.76	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	404	109	368	550	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	8	16	28	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	39	28	117	175	----
Total Alkalinity as CaCO ₃	----	1	mg/L	39	36	134	203	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	<1	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	122	17	42	101	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	24	2	3	3	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	24	4	4	3	----
Magnesium	7439-95-4	1	mg/L	7	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	40	17	79	121	----
Potassium	7440-09-7	1	mg/L	11	<1	2	2	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	0.40	0.14	0.01	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	0.004	0.002	----
Arsenic	7440-38-2	0.001	mg/L	0.007	0.014	0.008	0.319	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.001	<0.001	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Molybdenum	7439-98-7	0.001	mg/L	0.044	0.012	0.046	0.311	----
Selenium	7782-49-2	0.01	mg/L	0.12	0.02	0.09	0.01	----

Page : 4 of 4
 Work Order : EB1233396
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 111207 Project Stone



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				21-DEC-2012 15:00	21-DEC-2012 15:00	21-DEC-2012 15:00	21-DEC-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1233396-001	EB1233396-002	EB1233396-003	EB1233396-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	0.01	0.02	0.13	0.08	----
Boron	7440-42-8	0.05	mg/L	0.08	<0.05	0.14	<0.05	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.01	0.16	0.09	0.49	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1300269	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-JAN-2013
Sampler	: ----	Issue Date	: 10-JAN-2013
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

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ISO/IEC 17025.

Signatories

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Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1300269
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				04-JAN-2013 15:00	04-JAN-2013 15:00	04-JAN-2013 15:00	04-JAN-2013 15:00	----
Compound	CAS Number	LOR	Unit	EB1300269-001	EB1300269-002	EB1300269-003	EB1300269-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.87	8.98	8.83	8.53	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	400	108	305	508	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	12	28	21	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	43	19	97	162	----
Total Alkalinity as CaCO ₃	ALK_TOTAL	1	mg/L	43	31	125	183	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	3	<1	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	127	18	33	49	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	11	2	2	4	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	26	4	3	6	----
Magnesium	7439-95-4	1	mg/L	7	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	38	19	72	112	----
Potassium	7440-09-7	1	mg/L	12	<1	2	3	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	0.84	0.08	0.08	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	0.004	0.002	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.015	0.002	0.224	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	0.002	0.001	0.001	0.005	----
Cobalt	7440-48-4	0.001	mg/L	0.006	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	0.025	0.001	<0.001	0.005	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	0.053	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	0.020	0.002	0.002	0.003	----
Molybdenum	7439-98-7	0.001	mg/L	0.036	0.020	0.041	0.148	----
Selenium	7782-49-2	0.01	mg/L	0.10	0.03	0.08	0.02	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
				04-JAN-2013 15:00	04-JAN-2013 15:00	04-JAN-2013 15:00	04-JAN-2013 15:00	----
Compound	CAS Number	LOR	Unit	EB1300269-001	EB1300269-002	EB1300269-003	EB1300269-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	<0.01	0.02	0.10	0.06	----
Boron	7440-42-8	0.05	mg/L	0.08	<0.05	0.11	0.07	----
Iron	7439-89-6	0.05	mg/L	<0.05	0.14	<0.05	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	1.14	0.20	0.06	0.15	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1301127	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 101147		
C-O-C number	: ---	Date Samples Received	: 19-JAN-2013
Sampler	: ---	Issue Date	: 29-JAN-2013
Site	: ---		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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Signatories

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Signatories	Position	Accreditation Category
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1301127
Client : RGS ENVIRONMENTAL PTY LTD
Project : Project Stone

General Comments

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- **EK067 (Total Phosphorus); LOR's have been raised on sample EB1301127 003 (KLC 7) due to matrix interference.**



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				18-JAN-2012 15:00	18-JAN-2012 15:00	18-JAN-2012 15:00	18-JAN-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1301127-001	EB1301127-002	EB1301127-003	EB1301127-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.93	8.03	8.58	8.50	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	334	163	360	536	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	15	15	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	42	50	133	193	----
Total Alkalinity as CaCO ₃	ALK_TOTAL	1	mg/L	42	50	148	208	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	2	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	104	28	32	42	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	7	2	2	4	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	21	4	4	4	----
Magnesium	7439-95-4	1	mg/L	6	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	32	29	78	109	----
Potassium	7440-09-7	1	mg/L	11	1	3	3	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.62	0.18	0.07	----
Antimony	7440-36-0	0.001	mg/L	<0.001	0.001	0.005	0.002	----
Arsenic	7440-38-2	0.001	mg/L	0.003	0.027	0.005	0.208	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	0.004	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	0.004	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Molybdenum	7439-98-7	0.001	mg/L	0.025	0.021	0.025	0.080	----
Selenium	7782-49-2	0.01	mg/L	0.07	0.04	0.09	<0.01	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
				18-JAN-2012 15:00	18-JAN-2012 15:00	18-JAN-2012 15:00	18-JAN-2012 15:00	----
Compound	CAS Number	LOR	Unit	EB1301127-001	EB1301127-002	EB1301127-003	EB1301127-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	0.01	0.03	0.10	0.06	----
Boron	7440-42-8	0.05	mg/L	0.08	<0.05	0.12	<0.05	----
Iron	7439-89-6	0.05	mg/L	<0.05	0.09	<0.05	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.04	0.02	<0.05	0.81	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1302359	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 01-FEB-2013
Sampler	: Mandie Matheson	Issue Date	: 11-FEB-2013
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1302359
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				01-FEB-2013 15:00	01-FEB-2013 15:00	01-FEB-2013 15:00	01-FEB-2013 15:00	----
Compound	CAS Number	LOR	Unit	EB1302359-001	EB1302359-002	EB1302359-003	EB1302359-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.95	8.55	8.59	8.39	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	416	164	326	403	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	2	13	6	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	48	54	131	261	----
Total Alkalinity as CaCO ₃	----	1	mg/L	48	56	144	267	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	<1	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	123	29	22	28	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	6	2	<1	11	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	28	3	3	4	----
Magnesium	7439-95-4	1	mg/L	8	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	33	28	69	84	----
Potassium	7440-09-7	1	mg/L	11	1	2	3	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.68	0.05	<0.01	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	0.004	0.002	----
Arsenic	7440-38-2	0.001	mg/L	0.003	0.030	0.007	0.145	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	0.004	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	0.002	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Molybdenum	7439-98-7	0.001	mg/L	0.027	0.022	0.020	0.050	----
Selenium	7782-49-2	0.01	mg/L	0.07	0.04	0.06	<0.01	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
				01-FEB-2013 15:00	01-FEB-2013 15:00	01-FEB-2013 15:00	01-FEB-2013 15:00	----
Compound	CAS Number	LOR	Unit	EB1302359-001	EB1302359-002	EB1302359-003	EB1302359-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	0.01	0.03	0.12	0.06	----
Boron	7440-42-8	0.05	mg/L	0.08	<0.05	0.11	<0.05	----
Iron	7439-89-6	0.05	mg/L	<0.05	0.09	<0.05	<0.05	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	1.90	0.04	0.12	5.78	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB1303931	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 16-FEB-2013
Sampler	: Mandie Matheson	Issue Date	: 01-MAR-2013
Site	: ----		
Quote number	: BN/413/12	No. of samples received	: 4
		No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1303931
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Page : 3 of 4
 Work Order : EB1303931
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
Client sampling date / time				15-FEB-2013 15:00	15-FEB-2013 15:00	15-FEB-2013 15:00	15-FEB-2013 15:00	----
Compound	CAS Number	LOR	Unit	EB1303931-001	EB1303931-002	EB1303931-003	EB1303931-004	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.91	8.37	8.65	8.71	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	272	182	327	356	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	4	17	21	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	46	53	141	168	----
Total Alkalinity as CaCO ₃	----	1	mg/L	46	57	158	189	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	1	1	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	82	33	24	27	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	2	2	<1	<1	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	18	4	4	3	----
Magnesium	7439-95-4	1	mg/L	5	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	24	34	72	82	----
Potassium	7440-09-7	1	mg/L	9	2	2	2	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	1.66	6.37	2.28	----
Antimony	7440-36-0	0.001	mg/L	0.001	0.002	0.004	0.002	----
Arsenic	7440-38-2	0.001	mg/L	0.003	0.036	0.005	0.190	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	<0.001	0.003	----
Copper	7440-50-8	0.001	mg/L	<0.001	0.002	0.001	0.002	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	0.002	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.003	0.002	----
Molybdenum	7439-98-7	0.001	mg/L	0.014	0.016	0.011	0.028	----
Selenium	7782-49-2	0.01	mg/L	0.04	0.04	0.05	<0.01	----



Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Client sample ID

Client sampling date / time

				Project Stone KLC 5	Project Stone KLC 6	Project Stone KLC 7	Project Stone KLC 8	----
				15-FEB-2013 15:00	15-FEB-2013 15:00	15-FEB-2013 15:00	15-FEB-2013 15:00	----
Compound	CAS Number	LOR	Unit	EB1303931-001	EB1303931-002	EB1303931-003	EB1303931-004	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Vanadium	7440-62-2	0.01	mg/L	0.01	0.03	0.09	0.07	----
Boron	7440-42-8	0.05	mg/L	0.09	<0.05	0.15	<0.05	----
Iron	7439-89-6	0.05	mg/L	<0.05	0.21	1.48	0.56	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.04	0.05	0.10	0.26	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1326929	Page	: 1 of 9
Amendment	: 1		
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project Stone (RGS code 101147)	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-NOV-2013
Sampler	: ----	Issue Date	: 31-DEC-2013
Site	: ----		
Quote number	: BN/606/13	No. of samples received	: 3
		No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



Page : 2 of 9
 Work Order : EB1326929 Amendment 1
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : Project Stone (RGS code 101147)

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- Analysis is performed by ALS Fyshwick (NATA Accreditation number 992).
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.
- EA250 LSC : LOR for Gross Alpha and Beta raised due to high solid content
- EK026SF : EB1327778-001 matrix spike failed for TCN due to possible sample interference. This has been confirmed by re-analysis.
- It is recognised that EK059 (Nitrite and Nitrate as NOx) is less than EK057 (Nitrate as N) for sample EB1326929 001 (Proj.Stone Ash). However, the difference is within experimental variation of the methods.
- Radiological work undertaken by ALS Laboratory Group (Ceska Lipa) under CAI accreditation No. L1163. Report No. \$. NATA and CAI accreditations' are both recognised under ILAC.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Don Sirimanne	Technical Officer	Radionuclides
Dr Titus Vimalasiri	Senior Scientist	Radionuclides
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
		Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics
Varsha Ho Wing	Non-Metals Team Leader	Melbourne Inorganics



Analytical Results

Sub-Matrix: ASH (Matrix: SOIL)

Client sample ID

				Proj.Stone Ash TCLP	Proj.Stone Ash DI LEACH	----	----	----
Client sampling date / time				04-NOV-2013 13:15	04-NOV-2013 13:15	----	----	----
Compound	CAS Number	LOR	Unit	EB1326929-001	EB1326929-003	----	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	10.6	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	1330	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	26.4	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	2.7	----	----	----	----
Fizz Rating	----	0	Fizz Unit	1	----	----	----	----
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	<0.005	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	<1.0	----	----	----	----
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	652	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	378	----	----	----	----
ED038A: Acidity								
Acidity	----	1	mg/kg	<1	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.26	----	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	23	----	----	----	----
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	460	----	----	----	----
Potassium	7440-09-7	50	mg/kg	870	----	----	----	----
Calcium	7440-70-2	50	mg/kg	18800	----	----	----	----
Magnesium	7439-95-4	50	mg/kg	2310	----	----	----	----
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	34200	----	----	----	----
Antimony	7440-36-0	5	mg/kg	<5	----	----	----	----
Barium	7440-39-3	10	mg/kg	70	----	----	----	----
Beryllium	7440-41-7	1	mg/kg	4	----	----	----	----
Boron	7440-42-8	50	mg/kg	<50	----	----	----	----



Analytical Results

Sub-Matrix: ASH (Matrix: SOIL)

Client sample ID

Client sampling date / time

Sub-Matrix: ASH (Matrix: SOIL)				Client sample ID	Proj.Stone Ash TCLP	Proj.Stone Ash DI LEACH	----	----	----
Client sampling date / time					04-NOV-2013 13:15	04-NOV-2013 13:15	----	----	----
Compound	CAS Number	LOR	Unit	EB1326929-001	EB1326929-003	----	----	----	----
EG005T: Total Metals by ICP-AES - Continued									
Cobalt	7440-48-4	2	mg/kg	4	----	----	----	----	----
Iron	7439-89-6	50	mg/kg	14900	----	----	----	----	----
Manganese	7439-96-5	5	mg/kg	328	----	----	----	----	----
Molybdenum	7439-98-7	2	mg/kg	6	----	----	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----	----
Silver	7440-22-4	2	mg/kg	<2	----	----	----	----	----
Tin	7440-31-5	5	mg/kg	<5	----	----	----	----	----
Vanadium	7440-62-2	5	mg/kg	77	----	----	----	----	----
Titanium	7440-32-6	10	mg/kg	560	----	----	----	----	----
Thallium	7440-28-0	5	mg/kg	<5	----	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	7	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	25	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	9	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	14	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	32	----	----	----	----	----
EG020T: Total Metals by ICP-MS									
Thorium	7440-29-1	0.1	mg/kg	8.5	----	----	----	----	----
Uranium	7440-61-1	0.1	mg/kg	1.2	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----	----
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg	<20	----	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	----	0.1	mg/kg	0.1	----	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	----	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	----	----	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)									



Analytical Results

Sub-Matrix: **ASH (Matrix: SOIL)**

Client sample ID

				Proj.Stone Ash TCLP	Proj.Stone Ash DI LEACH	----	----	----
Client sampling date / time				04-NOV-2013 13:15	04-NOV-2013 13:15	----	----	----
Compound	CAS Number	LOR	Unit	EB1326929-001	EB1326929-003	----	----	----
EK062: Total Nitrogen as N (TKN + NOx) - Continued								
^ Total Nitrogen as N	----	20	mg/kg	<20	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	107	----	----	----	----
EN33: TCLP Leach								
Initial pH	----	0.1	pH Unit	11.0	----	----	----	----
After HCl pH	----	0.1	pH Unit	1.4	----	----	----	----
Extraction Fluid Number	----	1	-	1	----	----	----	----
Final pH	----	0.1	pH Unit	5.4	----	----	----	----
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	----	10.7	----	----	----
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)								
Final pH	----	0.1	pH Unit	----	7.0	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.07	----	----	----	----



Analytical Results

Sub-Matrix: DI WATER LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Proj.Stone Ash TCLP	Proj.Stone Ash DI LEACH	----	----	----
				06-NOV-2013 14:00		----	----	----
Compound	CAS Number	LOR	Unit	EB1326929-001	EB1326929-003	----	----	----
EA250: Gross Alpha and Beta Activity								
Gross alpha	----	0.05	Bq/L	<2.00	<0.24	----	----	----
Gross beta activity - 40K	----	0.10	Bq/L	<4.00	<0.48	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	338	215	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	----	9	----	----	----
ED093W: Water Leachable Major Cations								
Calcium	7440-70-2	1	mg/L	629	136	----	----	----
Magnesium	7439-95-4	1	mg/L	25	<1	----	----	----
Sodium	7440-23-5	1	mg/L	1410	4	----	----	----
Potassium	7440-09-7	1	mg/L	4	<1	----	----	----
EG020W: Water Leachable Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	3.18	0.22	----	----	----
Antimony	7440-36-0	0.001	mg/L	0.006	0.003	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.002	0.013	----	----	----
Beryllium	7440-41-7	0.001	mg/L	0.009	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	0.402	0.258	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.066	0.063	----	----	----
Cobalt	7440-48-4	0.001	mg/L	0.006	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	0.023	0.003	----	----	----
Lead	7439-92-1	0.001	mg/L	0.002	0.002	----	----	----
Manganese	7439-96-5	0.001	mg/L	0.156	<0.001	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.105	0.148	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.026	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L	0.02	<0.01	----	----	----
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	----	----	----
Thallium	7440-28-0	0.001	mg/L	<0.001	<0.001	----	----	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	----	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	----	----	----
Titanium	7440-32-6	0.01	mg/L	<0.01	<0.01	----	----	----
Uranium	7440-61-1	0.001	mg/L	0.007	<0.001	----	----	----
Vanadium	7440-62-2	0.01	mg/L	0.13	1.27	----	----	----



Analytical Results

Sub-Matrix: DI WATER LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Proj.Stone Ash TCLP	Proj.Stone Ash DI LEACH	----	----	----
				06-NOV-2013 14:00		----	----	----
Compound	CAS Number	LOR	Unit	EB1326929-001	EB1326929-003	----	----	----
EG020W: Water Leachable Metals by ICP-MS - Continued								
Zinc	7440-66-6	0.005	mg/L	0.498	0.065	----	----	----
Boron	7440-42-8	0.05	mg/L	0.78	0.84	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EG050G-W: Hexavalent Chromium - Water Leachable								
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.07	0.07	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	3.1	0.9	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.09	0.06	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.01	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	<0.1	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	0.02	----	----	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Proj.Stone Ash	----	----	----	----
1:5 Soil:DI Water	----	----	----	----
04-NOV-2013 13:15	----	----	----	----
EB1326929-002	----	----	----	----

Client sampling date / time

Compound	CAS Number	LOR	Unit					
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	mg/L	1060	----	----	----	----



Analytical Results

Sub-Matrix: ZHE LEACHATE (Matrix: WATER)

Client sample ID

				Proj.Stone Ash TCLP	Proj.Stone Ash DI LEACH	----	----	----
Client sampling date / time				12-NOV-2013 08:11	10-DEC-2013 08:54	----	----	----
Compound	CAS Number	LOR	Unit	EB1326929-001	EB1326929-003	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.013	----	----	----



CERTIFICATE OF ANALYSIS

Work Order	: EB1321062	Page	: 1 of 7
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: Project China Stone	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 29-AUG-2013
Sampler	: Bob Leach	Issue Date	: 29-NOV-2013
Site	: Project China Stone		
Quote number	: BN/666/13	No. of samples received	: 2
		No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.**
- **TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.**



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics
Jiah Wallace	Physical Chemistry Section Supervisor	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
SATISH.TRIVEDI	2 IC Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils
		Brisbane Inorganics



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Power Station Feed Sample	----	----	----	----
				1:5 Soil:DI Water				
				Client sampling date / time	28-AUG-2013 13:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1321062-002	----	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	mg/L	223	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Power Station Feed
Sample

28-AUG-2013 13:00

Client sampling date / time

EB1321062-001

Compound	CAS Number	LOR	Unit					
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.1	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	142	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	19.5	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	2.0	----	----	----	----
Fizz Rating	----	0	Fizz Unit	1	----	----	----	----
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	0.010	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	5.2	----	----	----	----
ED037: Alkalinity								
Total Alkalinity as CaCO3	----	1	mg/kg	219	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/kg	219	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/kg	<1	----	----	----	----
ED038A: Acidity								
Acidity	----	1	mg/kg	12	----	----	----	----
ED040: Sulfur as SO4 2-								
Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	----	----	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	30	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.18	----	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	80	----	----	----	----
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	50	----	----	----	----
Magnesium	7439-95-4	10	mg/kg	10	----	----	----	----
Sodium	7440-23-5	10	mg/kg	140	----	----	----	----
Potassium	7440-09-7	10	mg/kg	10	----	----	----	----
ED093T: Total Major Cations								
Sodium	7440-23-5	50	mg/kg	270	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				Power Station Feed Sample				
				28-AUG-2013 13:00				
				EB1321062-001				
Compound	CAS Number	LOR	Unit					
ED093T: Total Major Cations - Continued								
Potassium	7440-09-7	50	mg/kg	130				
Calcium	7440-70-2	50	mg/kg	6600				
Magnesium	7439-95-4	50	mg/kg	810				
EG005S : Soluble Metals by ICPAES								
Boron	7440-42-8	1	mg/kg	<1				
Iron	7439-89-6	1	mg/kg	<1				
Tin	7440-31-5	0.1	mg/kg	<0.1				
EG005T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	1370				
Antimony	7440-36-0	5	mg/kg	<5				
Barium	7440-39-3	10	mg/kg	50				
Beryllium	7440-41-7	1	mg/kg	1				
Boron	7440-42-8	50	mg/kg	<50				
Cobalt	7440-48-4	2	mg/kg	<2				
Iron	7439-89-6	50	mg/kg	4200				
Manganese	7439-96-5	5	mg/kg	78				
Molybdenum	7439-98-7	2	mg/kg	<2				
Selenium	7782-49-2	5	mg/kg	<5				
Silver	7440-22-4	2	mg/kg	<2				
Tin	7440-31-5	5	mg/kg	<5				
Vanadium	7440-62-2	5	mg/kg	28				
Phosphorus	7723-14-0	50	mg/kg	50				
Titanium	7440-32-6	10	mg/kg	200				
Thallium	7440-28-0	5	mg/kg	<5				
Arsenic	7440-38-2	5	mg/kg	<5				
Cadmium	7440-43-9	1	mg/kg	<1				
Chromium	7440-47-3	2	mg/kg	<2				
Copper	7440-50-8	5	mg/kg	12				
Lead	7439-92-1	5	mg/kg	7				
Nickel	7440-02-0	2	mg/kg	<2				
Zinc	7440-66-6	5	mg/kg	28				
EG020S: Soluble Metals by ICPMS								
Arsenic	7440-38-2	0.01	mg/kg	<0.01				



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Power Station Feed
Sample

28-AUG-2013 13:00

Client sampling date / time

EB1321062-001

Compound	CAS Number	LOR	Unit	EB1321062-001	----	----	----	----
EG020S: Soluble Metals by ICPMS - Continued								
Selenium	7782-49-2	0.1	mg/kg	<0.1	----	----	----	----
Silver	7440-22-4	0.01	mg/kg	<0.01	----	----	----	----
Barium	7440-39-3	0.01	mg/kg	0.27	----	----	----	----
Thallium	7440-28-0	0.01	mg/kg	<0.01	----	----	----	----
Beryllium	7440-41-7	0.01	mg/kg	<0.01	----	----	----	----
Cadmium	7440-43-9	0.01	mg/kg	<0.01	----	----	----	----
Cobalt	7440-48-4	0.01	mg/kg	<0.01	----	----	----	----
Chromium	7440-47-3	0.01	mg/kg	<0.01	----	----	----	----
Copper	7440-50-8	0.01	mg/kg	<0.01	----	----	----	----
Manganese	7439-96-5	0.01	mg/kg	<0.01	----	----	----	----
Molybdenum	7439-98-7	0.01	mg/kg	0.04	----	----	----	----
Nickel	7440-02-0	0.01	mg/kg	<0.01	----	----	----	----
Lead	7439-92-1	0.01	mg/kg	<0.01	----	----	----	----
Antimony	7440-36-0	0.01	mg/kg	<0.01	----	----	----	----
Uranium	7440-61-1	0.01	mg/kg	<0.01	----	----	----	----
Zinc	7440-66-6	0.05	mg/kg	<0.05	----	----	----	----
Vanadium	7440-62-2	0.1	mg/kg	<0.1	----	----	----	----
Aluminium	7429-90-5	0.1	mg/kg	0.1	----	----	----	----
Thorium	7440-29-1	0.01	mg/kg	<0.01	----	----	----	----
Titanium	7440-32-6	0.1	mg/kg	<0.1	----	----	----	----
EG020T: Total Metals by ICP-MS								
Thorium	7440-29-1	0.1	mg/kg	3.9	----	----	----	----
Uranium	7440-61-1	0.1	mg/kg	0.5	----	----	----	----
EG035S: Soluble Mercury by FIMS								
Mercury	7439-97-6	0.0005	mg/kg	<0.0005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EG048: Hexavalent Chromium (Alkaline Digest)								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	----	----	----	----
EG049: Trivalent Chromium								
Trivalent Chromium	16065-83-1	2	mg/kg	<2	----	----	----	----
EK040: Fluoride								
Fluoride	16984-48-8	1	mg/kg	<1	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

				Client sample ID	Power Station Feed Sample				
				Client sampling date / time	28-AUG-2013 13:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1321062-001	----	----	----	----	----
EK040T: Fluoride Total									
Fluoride	16984-48-8	40	mg/kg	90	----	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%	34.4	----	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1326893	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-NOV-2013
Sampler	: Mandie Matheson	Issue Date	: 08-NOV-2013
Site	: ----		
Quote number	: BN/606/13	No. of samples received	: 2
		No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
Stephen Hislop	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1326893
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone

General Comments

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone - Ash (1)	Project Stone - Ash (2)			
Client sampling date / time				04-NOV-2013 11:00	04-NOV-2013 11:00			
Compound	CAS Number	LOR	Unit	EB1326893-001	EB1326893-002			
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	9.45	11.5	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1910	2370	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	182	----	----	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	92	62	----	----	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	3	<1	----	----	----
Total Alkalinity as CaCO ₃	----	1	mg/L	96	244	----	----	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	<1	<1	----	----	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	962	947	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	87	21	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	449	573	----	----	----
Magnesium	7439-95-4	1	mg/L	5	<1	----	----	----
Sodium	7440-23-5	1	mg/L	19	15	----	----	----
Potassium	7440-09-7	1	mg/L	7	7	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.03	0.48	----	----	----
Antimony	7440-36-0	0.001	mg/L	0.011	0.006	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.010	0.002	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	0.142	0.230	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0008	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.245	1.18	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	0.003	0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.980	2.34	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Project Stone - Ash (1)

Project Stone - Ash (2)

Client sampling date / time

04-NOV-2013 11:00

04-NOV-2013 11:00

Compound	CAS Number	LOR	Unit	EB1326893-001	EB1326893-002	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Selenium	7782-49-2	0.01	mg/L	0.02	0.02	----	----	----
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	----	----	----
Thallium	7440-28-0	0.001	mg/L	<0.001	<0.001	----	----	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	----	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	----	----	----
Titanium	7440-32-6	0.01	mg/L	<0.01	<0.01	----	----	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	----	----	----
Vanadium	7440-62-2	0.01	mg/L	5.01	1.88	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L	3.33	2.88	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.26	0.97	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.0	0.5	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.13	0.12	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.04	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	0.4	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	0.6	0.4	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.05	<0.01	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1330008	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone (ASH)	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 04-DEC-2013
C-O-C number	: ----	Issue Date	: 18-DEC-2013
Sampler	: Mandie Mathesone	No. of samples received	: 2
Site	: ----	No. of samples analysed	: 2
Quote number	: BN/606/13		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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- Analytical Results



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Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Greg Vogel	Laboratory Manager	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1330008
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone (ASH)

General Comments

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				Project Stone - Ash (1)	Project Stone - Ash (2)			
Client sampling date / time				04-DEC-2013 15:00	04-DEC-2013 15:00			
Compound	CAS Number	LOR	Unit	EB1330008-001	EB1330008-002			
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.95	8.38	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1640	1400	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	2	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	24	22	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	24	24	----	----	----
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	6	3	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	797	751	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	98	56	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	383	319	----	----	----
Magnesium	7439-95-4	1	mg/L	28	20	----	----	----
Sodium	7440-23-5	1	mg/L	3	3	----	----	----
Potassium	7440-09-7	1	mg/L	2	1	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	0.003	0.004	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.008	0.006	----	----	----
Boron	7440-42-8	0.05	mg/L	1.08	0.86	----	----	----
Barium	7440-39-3	0.001	mg/L	0.055	0.046	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.085	0.259	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Project Stone - Ash (1)

Project Stone - Ash (2)

Client sampling date / time

04-DEC-2013 15:00

04-DEC-2013 15:00

Compound	CAS Number	LOR	Unit	EB1330008-001	EB1330008-002	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Selenium	7782-49-2	0.01	mg/L	0.04	0.03	----	----	----
Vanadium	7440-62-2	0.01	mg/L	1.18	1.26	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.473	0.452	----	----	----
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	----	----	----
Thallium	7440-28-0	0.001	mg/L	<0.001	<0.001	----	----	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	----	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	----	----	----
Titanium	7440-32-6	0.01	mg/L	<0.01	<0.01	----	----	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.11	0.32	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	2.7	2.3	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.02	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.04	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.01	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	19.8	17.7	----	----	----
Total Cations	----	0.01	meq/L	21.6	17.7	----	----	----
Ionic Balance	----	0.01	%	4.31	0.13	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1400138	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone (ASH)	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-JAN-2014
Sampler	: Mandie Matheson	Issue Date	: 10-JAN-2014
Site	: ----		
Quote number	: BN/606/13	No. of samples received	: 2
		No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

WORLD RECOGNISED
ACCREDITATION

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1400138
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone (ASH)

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.**



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone - Ash (1)	Project Stone - Ash (2)			
Client sampling date / time				[04-JAN-2014]	[04-JAN-2014]			
Compound	CAS Number	LOR	Unit	EB1400138-001	EB1400138-002			
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.45	7.45	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1630	1670	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	35	33	----	----	----
Total Alkalinity as CaCO ₃	----	1	mg/L	35	33	----	----	----
ED038A: Acidity								
Acidity as CaCO ₃	----	1	mg/L	2	2	----	----	----
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	809	859	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	78	64	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	352	374	----	----	----
Magnesium	7439-95-4	1	mg/L	44	39	----	----	----
Sodium	7440-23-5	1	mg/L	4	4	----	----	----
Potassium	7440-09-7	1	mg/L	2	2	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	0.004	0.006	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.006	0.005	----	----	----
Boron	7440-42-8	0.05	mg/L	1.26	1.21	----	----	----
Barium	7440-39-3	0.001	mg/L	0.040	0.039	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.057	0.191	----	----	----
Copper	7440-50-8	0.001	mg/L	0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone - Ash (1)	Project Stone - Ash (2)			
				[04-JAN-2014]	[04-JAN-2014]			
Compound	CAS Number	LOR	Unit	EB1400138-001	EB1400138-002			
EG020F: Dissolved Metals by ICP-MS - Continued								
Selenium	7782-49-2	0.01	mg/L	0.03	0.03	----	----	----
Vanadium	7440-62-2	0.01	mg/L	0.80	0.80	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.466	0.494	----	----	----
Silver	7440-22-4	0.001	mg/L	<0.001	<0.001	----	----	----
Thallium	7440-28-0	0.001	mg/L	<0.001	<0.001	----	----	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	----	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	----	----	----
Titanium	7440-32-6	0.01	mg/L	<0.01	<0.01	----	----	----
Uranium	7440-61-1	0.001	mg/L	<0.001	0.001	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EG050G: Hexavalent Chromium by Discrete Analyser								
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.07	0.22	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	3.1	3.1	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.01	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.3	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	0.3	0.3	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.01	0.01	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1402472	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone (ASH)	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 04-FEB-2014
C-O-C number	: ----	Issue Date	: 12-FEB-2014
Sampler	: Mandie Matheson	No. of samples received	: 2
Site	: ----	No. of samples analysed	: 2
Quote number	: BN/606/13		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Greg Vogel	Laboratory Manager	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1402472
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone (ASH)

General Comments

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Page : 3 of 4
 Work Order : EB1402472
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone (ASH)



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone - Ash (1)	Project Stone - Ash (2)			
Client sampling date / time				04-FEB-2014 15:00	04-FEB-2014 15:00			
Compound	CAS Number	LOR	Unit	EB1402472-001	EB1402472-002			
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.69	7.75	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1000	998	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	26	27	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	26	27	----	----	----
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	6	3	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	398	400	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	47	42	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	158	160	----	----	----
Magnesium	7439-95-4	1	mg/L	26	24	----	----	----
Sodium	7440-23-5	1	mg/L	3	3	----	----	----
Potassium	7440-09-7	1	mg/L	1	1	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	0.001	0.002	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	----	----	----
Barium	7440-39-3	0.001	mg/L	0.029	0.027	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.035	0.127	----	----	----
Copper	7440-50-8	0.001	mg/L	0.001	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
Manganese	7439-96-5	0.001	mg/L	0.001	0.001	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.371	0.406	----	----	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone - Ash (1)	Project Stone - Ash (2)			
				04-FEB-2014 15:00	04-FEB-2014 15:00			
Compound	CAS Number	LOR	Unit	EB1402472-001	EB1402472-002			
EG020F: Dissolved Metals by ICP-MS - Continued								
Selenium	7782-49-2	0.01	mg/L	0.02	0.02	----	----	----
Vanadium	7440-62-2	0.01	mg/L	0.62	0.56	----	----	----
Boron	7440-42-8	0.05	mg/L	0.84	0.91	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EG050G: Hexavalent Chromium by Discrete Analyser								
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.04	0.16	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	2.3	2.1	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.07	0.06	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	0.2	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	0.2	0.3	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.03	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1405142	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone (ASH)	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 04-MAR-2014
C-O-C number	: ----	Issue Date	: 11-MAR-2014
Sampler	: Mandie Matheson	No. of samples received	: 2
Site	: ----	No. of samples analysed	: 2
Quote number	: BN/606/13		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

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ISO/IEC 17025.

WORLD RECOGNISED
ACCREDITATION

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Andrew Epps	Metals Production Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1405142
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone (ASH)

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Page : 3 of 4
 Work Order : EB1405142
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone (ASH)



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone - Ash (1)	Project Stone - Ash (2)			
Client sampling date / time				[04-MAR-2014]	[04-MAR-2014]			
Compound	CAS Number	LOR	Unit	EB1405142-001	EB1405142-002			
EA005: pH								
pH Value	----	0.01	pH Unit	6.79	7.56	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	854	769	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	25	28	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	25	28	----	----	----
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	8	8	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	339	281	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	34	26	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	137	121	----	----	----
Magnesium	7439-95-4	1	mg/L	22	18	----	----	----
Sodium	7440-23-5	1	mg/L	2	2	----	----	----
Potassium	7440-09-7	1	mg/L	1	<1	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	0.002	0.002	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	----	----	----
Barium	7440-39-3	0.001	mg/L	0.020	0.017	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.029	0.092	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.345	0.338	----	----	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone - Ash (1)	Project Stone - Ash (2)			
				[04-MAR-2014]	[04-MAR-2014]			
Compound	CAS Number	LOR	Unit	EB1405142-001	EB1405142-002			
EG020F: Dissolved Metals by ICP-MS - Continued								
Selenium	7782-49-2	0.01	mg/L	0.02	0.01	----	----	----
Vanadium	7440-62-2	0.01	mg/L	0.56	0.60	----	----	----
Boron	7440-42-8	0.05	mg/L	1.02	0.93	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.04	0.11	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.9	2.0	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.07	0.08	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.01	<0.01	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1408267	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 18 INGLIS STREET GRANGE QLD, AUSTRALIA 4051	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3856 5591	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3856 5591	Facsimile	: +61 7 3243 7218
Project	: 101147 Project Stone (ASH)	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-APR-2014
Sampler	: Mandie Matheson	Issue Date	: 11-APR-2014
Site	: ----		
Quote number	: BN/606/13	No. of samples received	: 2
		No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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- Analytical Results



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Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
Work Order : EB1408267
Client : RGS ENVIRONMENTAL PTY LTD
Project : 101147 Project Stone (ASH)

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Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- It is recognised that EG020F (Dissolved Chromium) is less than EG050G (Hexavalent Chromium) for some samples. However, the difference is within experimental variation of the methods.

Page : 3 of 4
 Work Order : EB1408267
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Project Stone (ASH)



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone - Ash (1)	Project Stone - Ash (2)			
Client sampling date / time				[04-APR-2014]	[04-APR-2014]			
Compound	CAS Number	LOR	Unit	EB1408267-001	EB1408267-002			
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.99	7.68	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	792	642	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	34	28	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	34	28	----	----	----
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	3	3	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	351	244	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	23	24	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	131	102	----	----	----
Magnesium	7439-95-4	1	mg/L	21	16	----	----	----
Sodium	7440-23-5	1	mg/L	2	2	----	----	----
Potassium	7440-09-7	1	mg/L	<1	<1	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	0.003	0.003	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	----	----	----
Barium	7440-39-3	0.001	mg/L	0.020	0.017	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.019	0.066	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.178	0.214	----	----	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone - Ash (1)	Project Stone - Ash (2)			
				[04-APR-2014]	[04-APR-2014]			
Compound	CAS Number	LOR	Unit	EB1408267-001	EB1408267-002			
EG020F: Dissolved Metals by ICP-MS - Continued								
Selenium	7782-49-2	0.01	mg/L	0.01	0.01	----	----	----
Vanadium	7440-62-2	0.01	mg/L	0.41	0.45	----	----	----
Boron	7440-42-8	0.05	mg/L	0.95	0.94	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.02	0.08	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.5	1.6	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.08	0.08	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.01	0.01	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB1410823	Page	: 1 of 4
Client	: RGS ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: MR ALAN ROBERTSON	Contact	: Customer Services
Address	: 123 WYNNE ST SUNNYBANK HILLS QLD, AUSTRALIA 4109	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: alan@rgsenv.com	E-mail	: Brisbane.Enviro.Services@alsglobal.com
Telephone	: +61 07 3344 1222	Telephone	: +61 7 3243 7222
Facsimile	: +61 07 3344 1222	Facsimile	: +61 7 3243 7218
Project	: 101147 Stone (ASH)	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 06-MAY-2014
Sampler	: Mandie Matheson	Issue Date	: 16-MAY-2014
Site	: ----		
Quote number	: BN/606/13	No. of samples received	: 2
		No. of samples analysed	: 2

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Signatories	Position	Accreditation Category
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics



Page : 2 of 4
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Project : 101147 Stone (ASH)

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LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- ED040F (Major Anions - Dissolved) and ED093F (Major Cations - Dissolved): The LOR for Samples EB1410823_001-002 have been raised due to matrix interference.

Page : 3 of 4
 Work Order : EB1410823
 Client : RGS ENVIRONMENTAL PTY LTD
 Project : 101147 Stone (ASH)



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

				Project Stone - Ash (1)	Project Stone - Ash (2)			
Client sampling date / time				06-MAY-2014 15:00	06-MAY-2014 15:00			
Compound	CAS Number	LOR	Unit	EB1410823-001	EB1410823-002			
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.86	7.03	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	559	461	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	24	31	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	24	31	----	----	----
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	2	5	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	242	168	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	10	10	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	82	68	----	----	----
Magnesium	7439-95-4	1	mg/L	13	11	----	----	----
Sodium	7440-23-5	1	mg/L	1	1	----	----	----
Potassium	7440-09-7	1	mg/L	<1	<1	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	0.001	0.002	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	----	----	----
Barium	7440-39-3	0.001	mg/L	0.010	0.010	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	0.009	0.033	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	0.119	0.151	----	----	----



Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Client sample ID

Client sampling date / time

				Project Stone - Ash (1)	Project Stone - Ash (2)	----	----	----
				06-MAY-2014 15:00	06-MAY-2014 15:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1410823-001	EB1410823-002	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Vanadium	7440-62-2	0.01	mg/L	0.38	0.44	----	----	----
Boron	7440-42-8	0.05	mg/L	0.54	0.52	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	0.03	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.3	1.7	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.12	0.12	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
Total Nitrogen as N	----	0.1	mg/L	0.1	0.1	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	----	----	----



ATTACHMENT D

KLC Test Results and Trends

RGS-KLC # 5: Project Stone

KLC Test Results: Overburden 1

	Weight (kg)	1.81	Total S (%)	0.117	ANC	39.57		
	pH (1:5)	8.31	Scr (%)	0.04	NAPP	-38.35		
	EC (µS/cm)	435	MPA	1.23	ANC:MPA	32.30		
Date	22-Nov-12	6-Dec-12	21-Dec-12	4-Jan-13	18-Jan-13	31-Jan-13	14-Feb-13	
Week	0	2	4	6	8	10	12	
Leach Number	1	2	3	4	5	6	7	
ALS Laboratory ID	EB1230507	EB1231978	EB1233396	EB1300269	EB1301127	EB1302359	EB1303931	
Volume Collected (L)	0.563	0.680	0.573	0.692	0.672	0.808	0.608	
Cum. Volume (L)	0.56	1.24	1.82	2.51	3.18	3.99	4.60	
Pore Volumes	0.5	1.1	1.6	2.2	2.8	3.5	4.0	
pH	7.90	7.46	7.54	7.55	7.65	7.46	7.47	
EC (mS/cm)	379	409	409	419	338	412	276	
Acidity (mg/L)*	2	2	2	3	2	2	1	
Alkalinity (mg/L)*	64	38	39	43	42	48	46	
Net Alkalinity (mg/L)*	62	36	37	40	40	46	45	
Dissolved elements (mg/L)	Guideline Limits #							
Aluminium (Al)	5	0.02	0.02	0.01	0.01	<0.01	<0.01	0.01
Arsenic (As)	0.5	0.007	0.007	0.007	<0.001	0.003	0.003	0.003
Boron (B)	5	0.08	0.10	0.08	0.08	0.08	0.08	0.09
Calcium (Ca)	1,000	26	23	24	26	21	28	18
Cadmium (Cd)	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride (Cl)	-	21	16	24	11	7	6	2
Cobalt (Co)	1	0.001	<0.001	<0.001	0.006	<0.001	<0.001	<0.001
Chromium (Cr)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	1	0.002	0.001	0.001	0.002	<0.001	<0.001	<0.001
Iron (Fe)	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	-	9	14	11	12	11	11	9
Magnesium (Mg)	-	6	7	7	7	6	8	5
Manganese (Mn)	-	0.010	0.015	<0.001	0.020	<0.001	<0.001	<0.001
Molybdenum (Mo)	0.15	0.078	0.065	0.044	0.036	0.025	0.027	0.014
Sodium (Na)	-	37	37	40	38	32	33	24
Nickel (Ni)	1	0.002	<0.001	<0.001	0.025	<0.001	<0.001	<0.001
Phosphorus (P)	-	0.32	0.06	<0.01	1.14	0.04	1.90	0.04
Lead (Pb)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfate (SO ₄)	1,000	84	115	122	127	104	123	82
Antimony (Sb)	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Selenium (Se)	0.02	0.10	0.12	0.12	0.10	0.07	0.07	0.04
Vanadium (V)	-	<0.01	0.01	0.01	<0.01	0.01	0.01	0.01
Zinc (Zn)	20	<0.005	<0.005	<0.005	0.053	<0.005	<0.005	<0.005
Calculations**								
SO₄ Release Rate	26	43	39	49	39	55	28	
Cumulative SO₄ Release	26	69	108	157	195	250	278	
Ca Release Rate	8.1	8.7	7.6	10.0	7.8	12.5	6.1	
Cumulative Ca Release	8.1	16.8	24.4	34.3	42.1	54.7	60.7	
Mg Release Rate	1.9	2.6	2.2	2.7	2.2	3.6	1.7	
Cumulative Mg Release	1.9	4.5	6.7	9.4	11.6	15.2	16.9	
Residual ANC (%)	99.93	99.85	99.78	99.69	99.62	99.51	99.45	
Residual Sulfur (%)	99.25	98.01	96.91	95.52	94.41	92.84	92.05	
SO₄/(Ca+Mg) molar ratio	1.0	1.4	1.4	1.4	1.4	1.2	1.3	

< indicates less than the analytical detection limit. * Acidity and alkalinity data calculated in mg CaCO₃/L.

** SO₄, Ca and Mg release rates calculated in mg/kg/flush.

Total S = Total Sulfur; CRS = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity

MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential

Guideline Limits refer to ANZECC (2000), Livestock Drinking Waters.

A 'dash' represents no trigger value provided for this element.

RGS-KLC # 6: Project Stone
KLC Test Results: Overburden 2

	Weight (kg)	1.99	Total S (%)	0.014	ANC	73.65		
	pH (1:5)	9.01	Scr (%)	-	NAPP	-73.23		
	EC (µS/cm)	132	MPA	0.42	ANC:MPA	174.27		
Date	22-Nov-12	6-Dec-12	21-Dec-12	4-Jan-13	18-Jan-13	31-Jan-13	14-Feb-13	
Week	0	2	4	6	8	10	12	
Leach Number	1	2	3	4	5	6	7	
ALS Laboratory ID	EB1230507	EB1231978	EB1233396	EB1300269	EB1301127	EB1302359	EB1303931	
Volume Collected (L)	0.728	0.763	0.765	0.774	0.770	0.797	0.772	
Cum. Volume (L)	0.73	1.49	2.26	3.03	3.80	4.60	5.37	
Pore Volumes	0.5	1.1	1.7	2.2	2.8	3.4	4.0	
pH	6.98	8.30	8.47	8.47	8.16	8.37	8.19	
EC (mS/cm)	146	133	116	116	165	171	189	
Acidity (mg/L)*	2	<1	<1	<1	2	<1	1	
Alkalinity (mg/L)*	3	40	36	31	50	56	57	
Net Alkalinity (mg/L)*	1	40	36	31	48	56	56	
Dissolved elements (mg/L)	Guideline Limits #							
Aluminium (Al)	5	<0.01	0.62	0.40	0.84	0.62	0.68	1.66
Arsenic (As)	0.5	<0.001	0.019	0.014	0.015	0.027	0.03	0.036
Boron (B)	5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Calcium (Ca)	1,000	10	4	4	4	4	3	4
Cadmium (Cd)	0.01	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride (Cl)	-	<1	2	2	2	2	2	2
Cobalt (Co)	1	0.038	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Copper (Cu)	1	0.007	0.001	<0.001	0.001	<0.001	<0.001	0.002
Iron (Fe)	-	<0.05	0.08	<0.05	0.14	0.09	0.09	0.21
Potassium (K)	-	5	1	<1	<1	1	1	2
Magnesium (Mg)	-	4	<1	<1	<1	<1	<1	<1
Manganese (Mn)	-	0.115	0.009	<0.001	0.002	<0.001	<0.001	<0.001
Molybdenum (Mo)	0.15	<0.001	0.019	0.012	0.020	0.021	0.022	0.016
Sodium (Na)	-	1	20	17	19	29	28	34
Nickel (Ni)	1	0.174	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Phosphorus (P)	-	0.02	0.13	0.16	0.20	0.02	0.04	0.05
Lead (Pb)	0.1	0.018	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfate (SO ₄)	1,000	54	14	17	18	28	29	33
Antimony (Sb)	-	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002
Selenium (Se)	0.02	0.04	0.02	0.02	0.03	0.04	0.04	0.04
Vanadium (V)	-	<0.01	0.02	0.02	0.02	0.03	0.03	0.03
Zinc (Zn)	20	0.240	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calculations**								
SO ₄ Release Rate		20	5	7	7	11	12	13
Cumulative SO ₄ Release		20	25	32	39	50	61	74
Ca Release Rate		3.7	1.5	1.5	1.6	1.6	1.2	1.6
Cumulative Ca Release		3.7	5.2	6.7	8.3	9.9	11.1	12.6
Mg Release Rate		1.5	0.2	0.2	0.2	0.2	0.2	0.2
Cumulative Mg Release		1.5	1.7	1.9	2.0	2.2	2.4	2.6
Residual ANC (%)		99.98	99.97	99.97	99.96	99.95	99.95	99.94
Residual Sulfur (%)		95.21	93.91	92.32	90.63	88.00	85.18	82.08
SO ₄ /(Ca+Mg) molar ratio		1.4	1.2	1.5	1.6	2.4	3.2	2.9

< indicates less than the analytical detection limit. * Acidity and alkalinity data calculated in mg CaCO₃/L.

** SO₄, Ca and Mg release rates calculated in mg/kg/flush.

Total S = Total Sulfur; CRS = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity

MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential

Guideline Limits refer to ANZECC (2000), Livestock Drinking Waters.

A 'dash' represents no trigger value provided for this element.

RGS-KLC # 7: Project Stone

KLC Test Results: Overburden 3

	Weight (kg)	1.73	Total S (%)	0.107	ANC	18.93		
	pH (1:5)	9.23	Scr (%)	0.032	NAPP	-17.95		
	EC (µS/cm)	396	MPA	0.98	ANC:MPA	19.32		
Date	22-Nov-12	6-Dec-12	21-Dec-12	4-Jan-13	18-Jan-13	31-Jan-13	14-Feb-13	
Week	0	2	4	6	8	10	12	
Leach Number	1	2	3	4	5	6	7	
ALS Laboratory ID	EB1230507	EB1231978	EB1233396	EB1300269	EB1301127	EB1302359	EB1303931	
Volume Collected (L)	0.665	0.702	0.636	0.735	0.637	0.852	0.557	
Cum. Volume (L)	0.67	1.37	2.00	2.74	3.38	4.23	4.78	
Pore Volumes	0.5	1.0	1.5	2.0	2.5	3.1	3.5	
pH	8.65	8.39	8.34	8.42	8.24	8.25	8.25	
EC (mS/cm)	292	344	371	318	359	327	323	
Acidity (mg/L)*	<1	<1	<1	<1	<1	<1	<1	
Alkalinity (mg/L)*	120	118	134	125	148	144	158	
Net Alkalinity (mg/L)*	120	118	134	125	148	144	158	
Dissolved elements (mg/L)	Guideline Limits #							
Aluminium (Al)	5	0.21	0.61	0.14	0.08	0.18	0.05	6.37
Arsenic (As)	0.5	0.004	0.006	0.008	0.002	0.005	0.007	0.005
Boron (B)	5	0.10	0.16	0.14	0.11	0.12	0.11	0.15
Calcium (Ca)	1,000	3	3	4	3	4	3	4
Cadmium (Cd)	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride (Cl)	-	8	8	3	2	2	<1	<1
Cobalt (Co)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	1	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001
Iron (Fe)	-	0.07	0.16	<0.05	<0.05	<0.05	<0.05	1.48
Potassium (K)	-	2	3	2	2	3	2	2
Magnesium (Mg)	-	<1	<1	<1	<1	<1	<1	<1
Manganese (Mn)	-	<0.001	0.002	<0.001	0.002	<0.001	<0.001	0.003
Molybdenum (Mo)	0.15	0.059	0.072	0.046	0.041	0.025	0.020	0.011
Sodium (Na)	-	63	72	79	72	78	69	72
Nickel (Ni)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (P)	-	0.02	0.02	0.09	0.06	<0.05	0.12	0.10
Lead (Pb)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Sulfate (SO₄)	1,000	17	42	42	33	32	22	24
Antimony (Sb)	-	0.002	0.003	0.004	0.004	0.005	0.004	0.004
Selenium (Se)	0.02	0.04	0.07	0.09	0.08	0.09	0.06	0.05
Vanadium (V)	-	0.07	0.15	0.13	0.10	0.10	0.12	0.09
Zinc (Zn)	20	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calculations**								
SO₄ Release Rate	7	17	15	14	12	11	8	
Cumulative SO₄ Release	7	24	39	53	65	75	83	
Ca Release Rate	1.2	1.2	1.5	1.3	1.5	1.5	1.3	
Cumulative Ca Release	1.2	2.4	3.8	5.1	6.6	8.0	9.3	
Mg Release Rate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Cumulative Mg Release	0.2	0.4	0.6	0.8	1.0	1.2	1.4	
Residual ANC (%)	99.98	99.96	99.94	99.92	99.89	99.87	99.85	
Residual Sulfur (%)	99.80	99.26	98.78	98.34	97.98	97.64	97.40	
SO₄/(Ca+Mg) molar ratio	1.9	4.6	3.6	3.6	2.8	2.4	2.1	

< indicates less than the analytical detection limit. * Acidity and alkalinity data calculated in mg CaCO₃/L.

** SO₄, Ca and Mg release rates calculated in mg/kg/flush.

Total S = Total Sulfur; CRS = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity

MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential

Guideline Limits refer to ANZECC (2000), Livestock Drinking Waters.

A 'dash' represents no trigger value provided for this element.

RGS-KLC # 8: Project Stone
KLC Test Results: Overburden 4

	Weight (kg)	2.13	Total S (%)	0.023	ANC	118.95		
	pH (1:5)	9.76	Scr (%)	-	NAPP	-118.26		
	EC (µS/cm)	471	MPA	0.69	ANC:MPA	172.63		
Date	22-Nov-12	6-Dec-12	21-Dec-12	4-Jan-13	18-Jan-13	31-Jan-13	14-Feb-13	
Week	0	2	4	6	8	10	12	
Leach Number	1	2	3	4	5	6	7	
ALS Laboratory ID	EB1230507	EB1231978	EB1233396	EB1300269	EB1301127	EB1302359	EB1303931	
Volume Collected (L)	0.634	0.708	0.632	0.629	0.566	0.603	0.642	
Cum. Volume (L)	0.63	1.34	1.97	2.60	3.17	3.77	4.41	
Pore Volumes	0.5	1.0	1.5	1.9	2.3	2.8	3.3	
pH	9.16	8.52	8.46	8.31	8.22	8.37	8.35	
EC (mS/cm)	435	604	539	513	526	384	348	
Acidity (mg/L)*	<1	<1	<1	<1	<1	<1	<1	
Alkalinity (mg/L)*	141	153	203	183	208	267	189	
Net Alkalinity (mg/L)*	141	153	203	183	208	267	189	
Dissolved elements (mg/L)	Guideline Limits #							
Aluminium (Al)	5	0.17	0.01	0.01	0.08	0.07	<0.01	2.28
Arsenic (As)	0.5	0.353	0.329	0.319	0.224	0.208	0.145	0.190
Boron (B)	5	0.08	0.07	<0.05	0.07	<0.05	<0.05	<0.05
Calcium (Ca)	1,000	2	4	3	6	4	4	3
Cadmium (Cd)	0.01	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride (Cl)	-	10	5	3	4	4	11	<1
Cobalt (Co)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003
Copper (Cu)	1	0.001	<0.001	<0.001	0.005	0.004	0.004	0.002
Iron (Fe)	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.56
Potassium (K)	-	2	3	2	3	3	3	2
Magnesium (Mg)	-	<1	<1	<1	<1	<1	<1	<1
Manganese (Mn)	-	<0.001	0.001	<0.001	0.003	<0.001	<0.001	0.002
Molybdenum (Mo)	0.15	1.200	0.929	0.311	0.148	0.080	0.050	0.028
Sodium (Na)	-	88	140	121	112	109	84	82
Nickel (Ni)	1	<0.001	<0.001	<0.001	0.005	0.004	0.002	0.002
Phosphorus (P)	-	0.26	0.39	0.49	0.15	0.81	5.78	0.26
Lead (Pb)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfate (SO₄)	1,000	82	147	101	49	42	28	27
Antimony (Sb)	-	0.003	0.002	0.002	0.002	0.002	0.002	0.002
Selenium (Se)	0.02	0.02	0.02	0.01	0.02	<0.01	<0.01	<0.01
Vanadium (V)	-	0.15	0.08	0.08	0.06	0.06	0.06	0.07
Zinc (Zn)	20	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calculations**								
SO₄ Release Rate		24	49	30	14	11	8	8
Cumulative SO₄ Release		24	73	103	118	129	137	145
Ca Release Rate		0.6	1.3	0.9	1.8	1.1	1.1	0.9
Cumulative Ca Release		0.6	1.9	2.8	4.6	5.7	6.8	7.7
Mg Release Rate		0.1	0.2	0.1	0.1	0.1	0.1	0.2
Cumulative Mg Release		0.1	0.3	0.5	0.6	0.7	0.9	1.0
Residual ANC (%)		100.00	99.99	99.99	99.99	99.99	99.98	99.98
Residual Sulfur (%)		96.38	89.13	84.68	82.53	80.88	79.70	78.49
SO₄/(Ca+Mg) molar ratio		12.1	12.7	11.0	3.0	3.6	2.4	2.9

< indicates less than the analytical detection limit. * Acidity and alkalinity data calculated in mg CaCO₃/L.

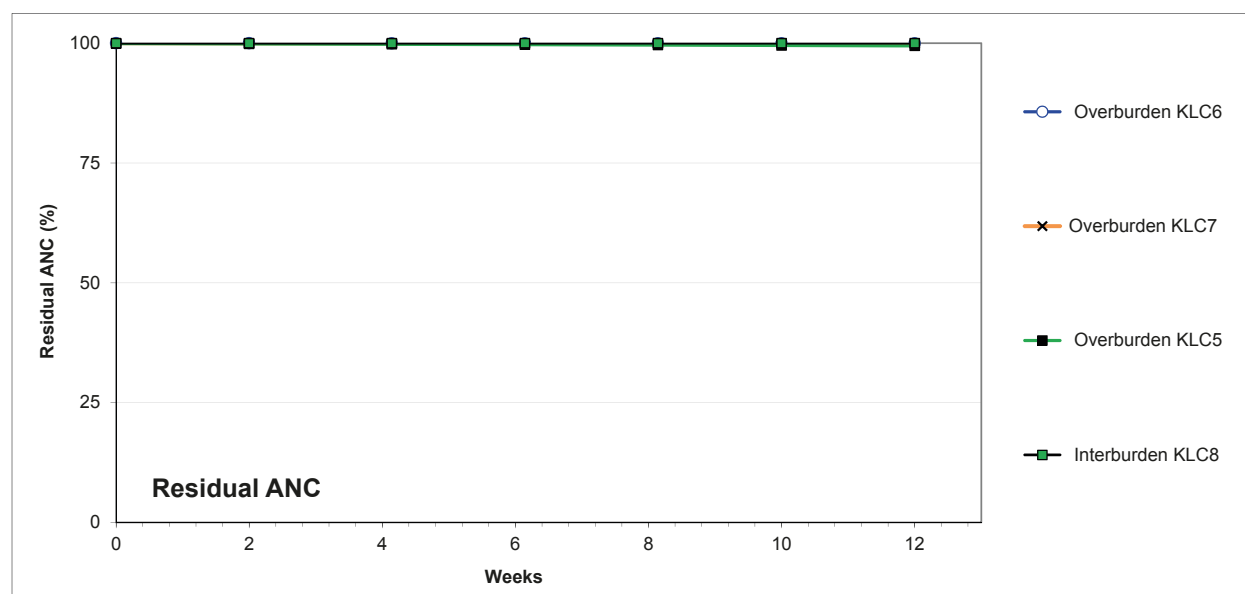
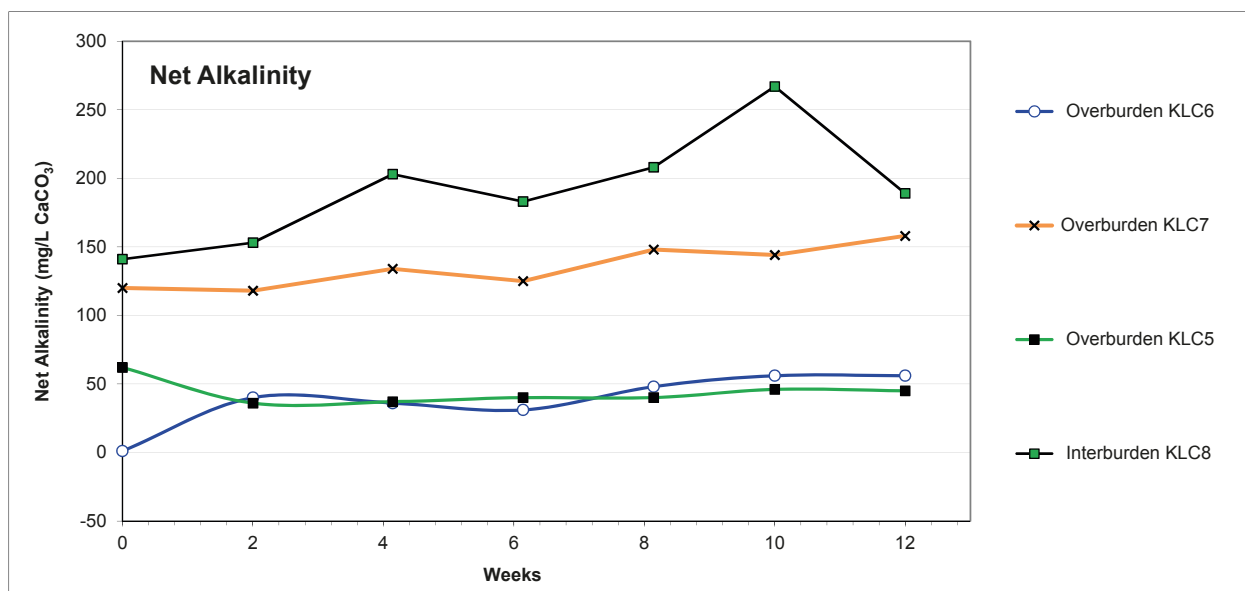
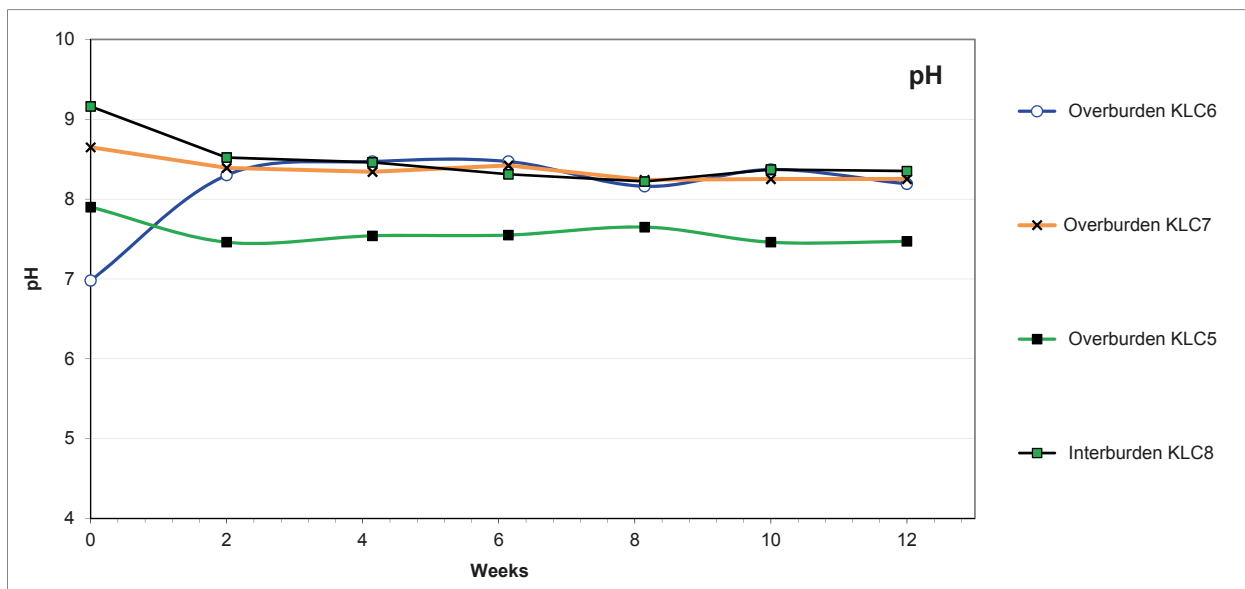
** SO₄, Ca and Mg release rates calculated in mg/kg/flush.

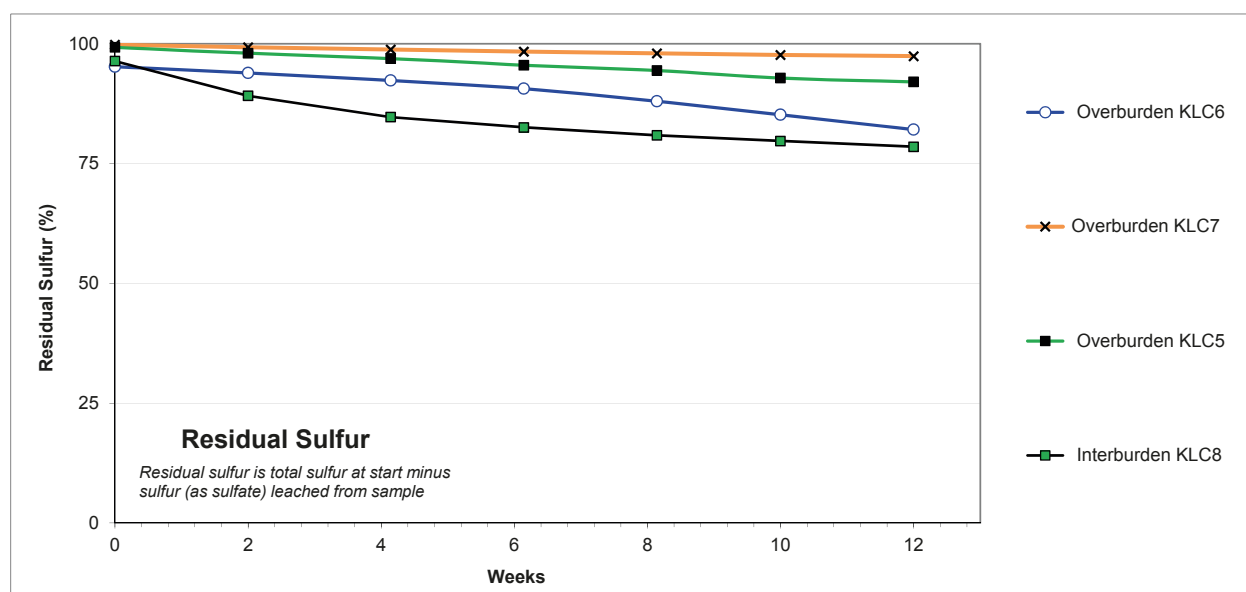
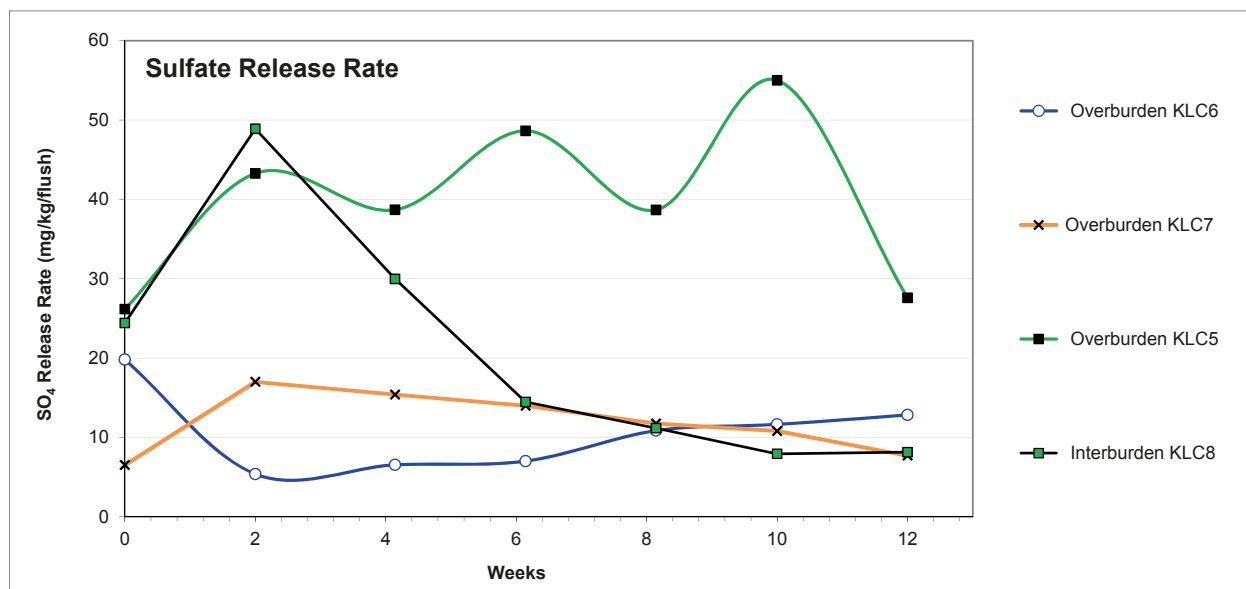
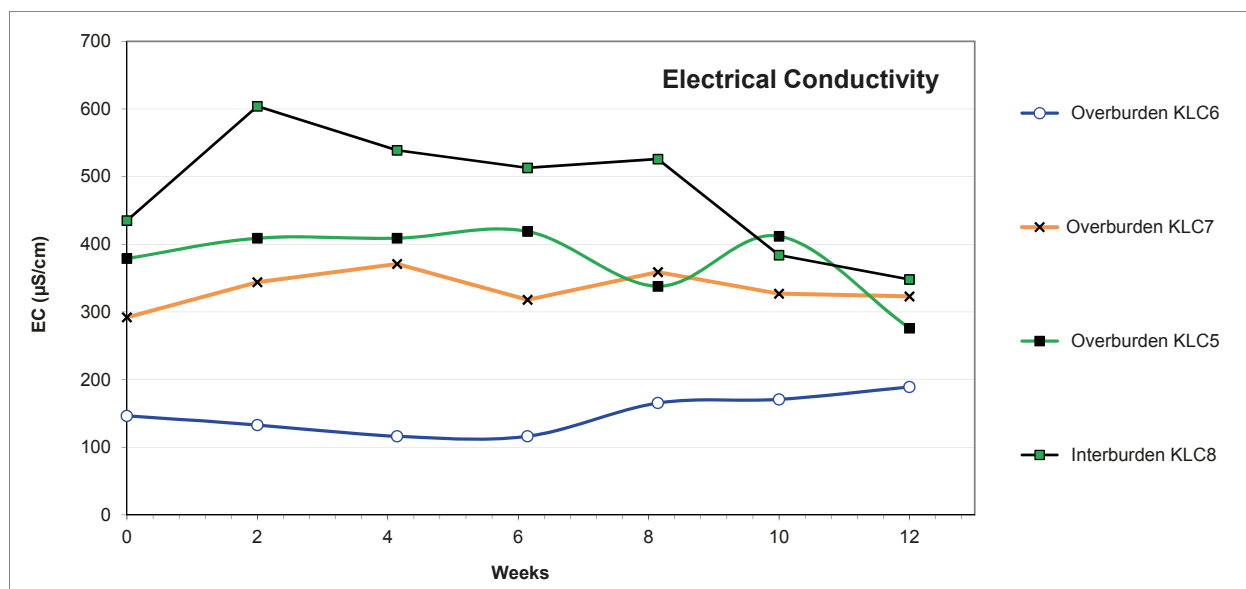
Total S = Total Sulfur; CRS = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity

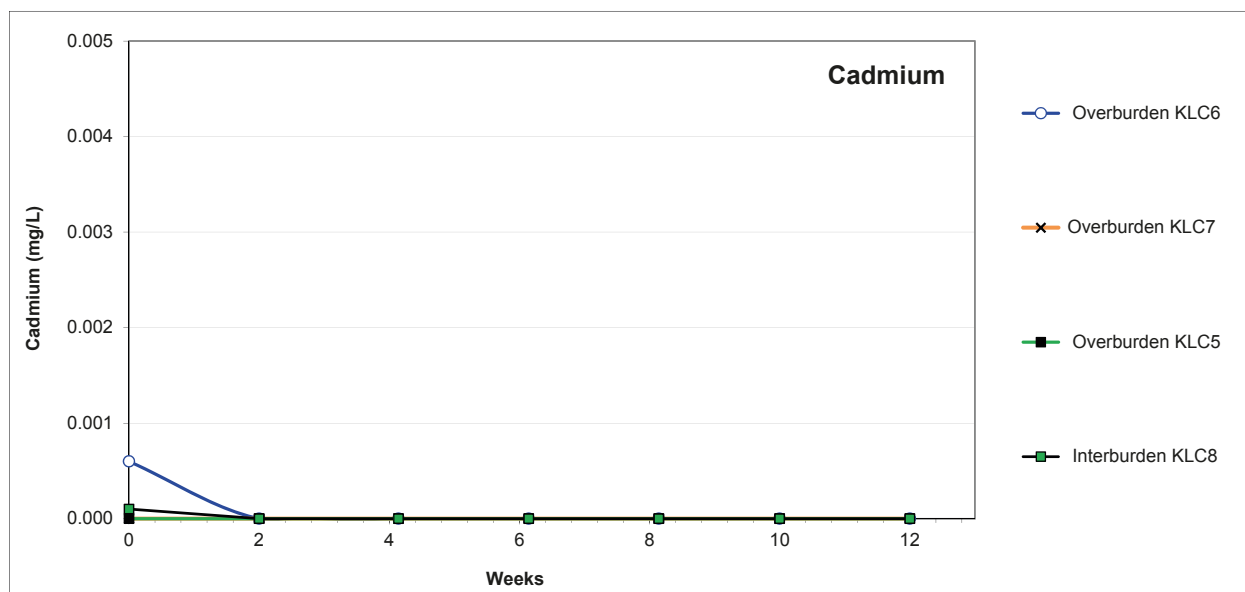
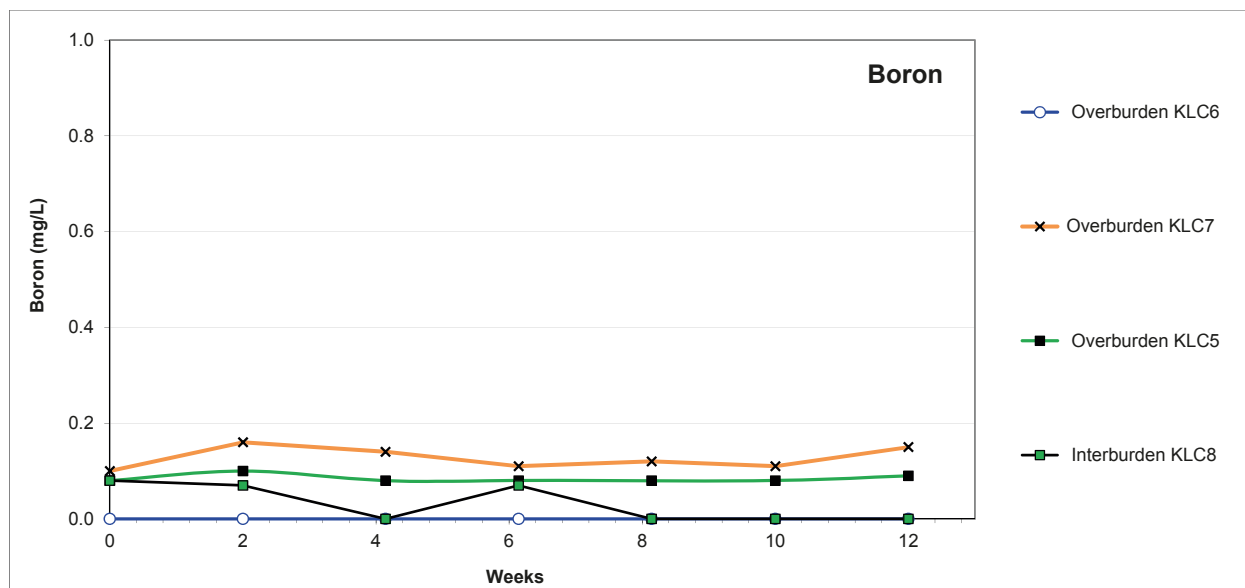
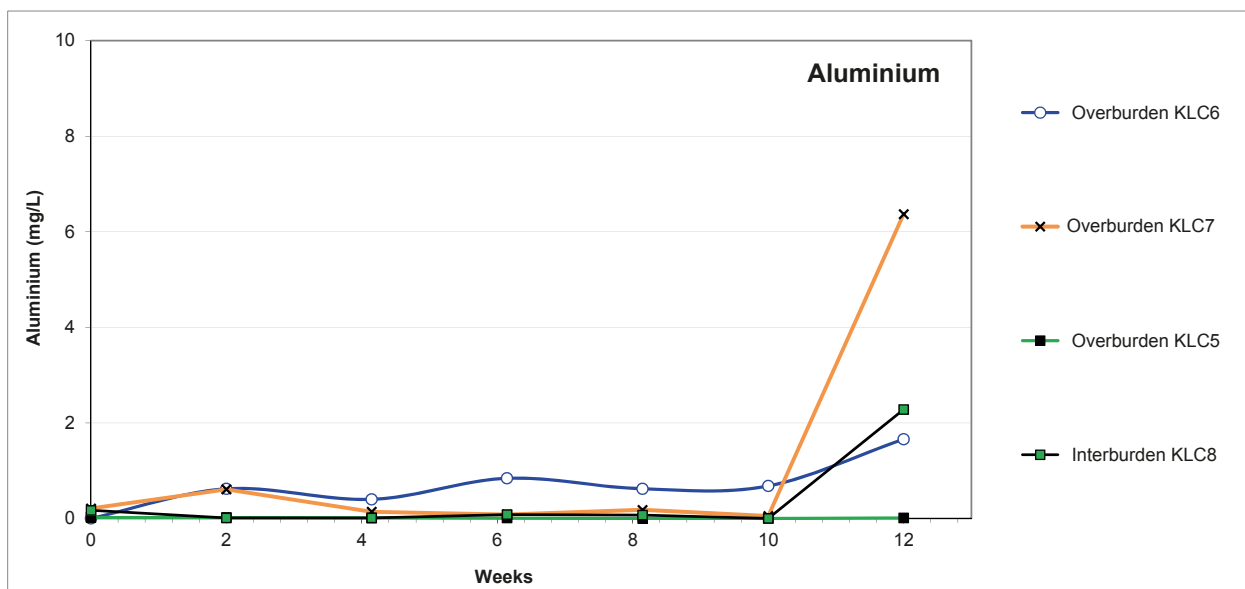
MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential

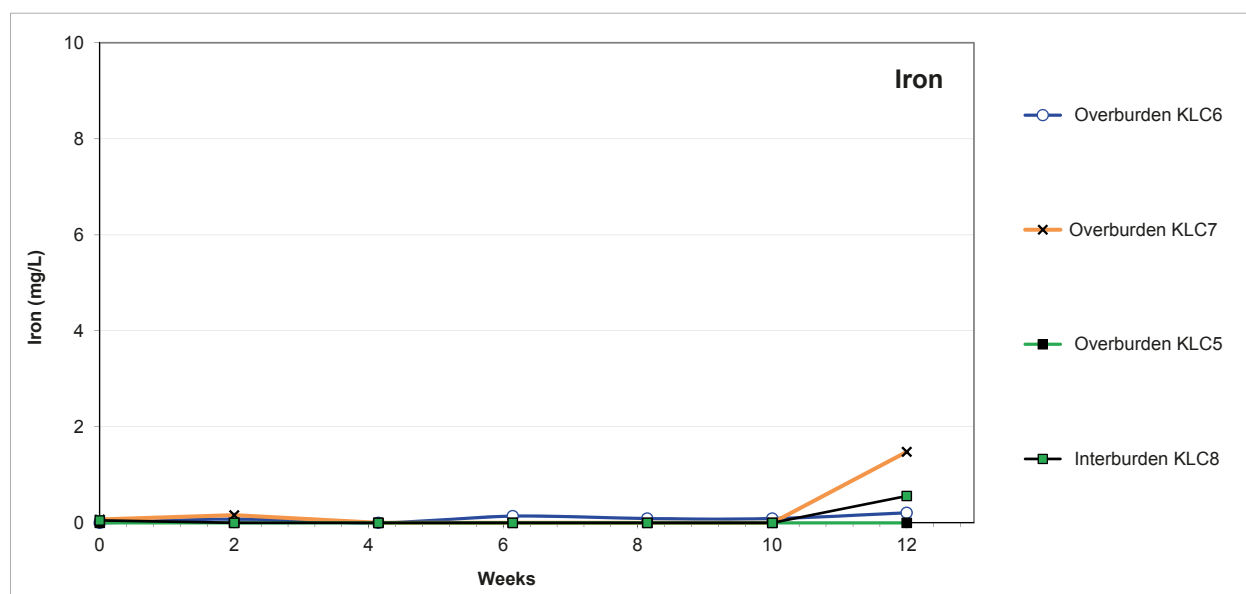
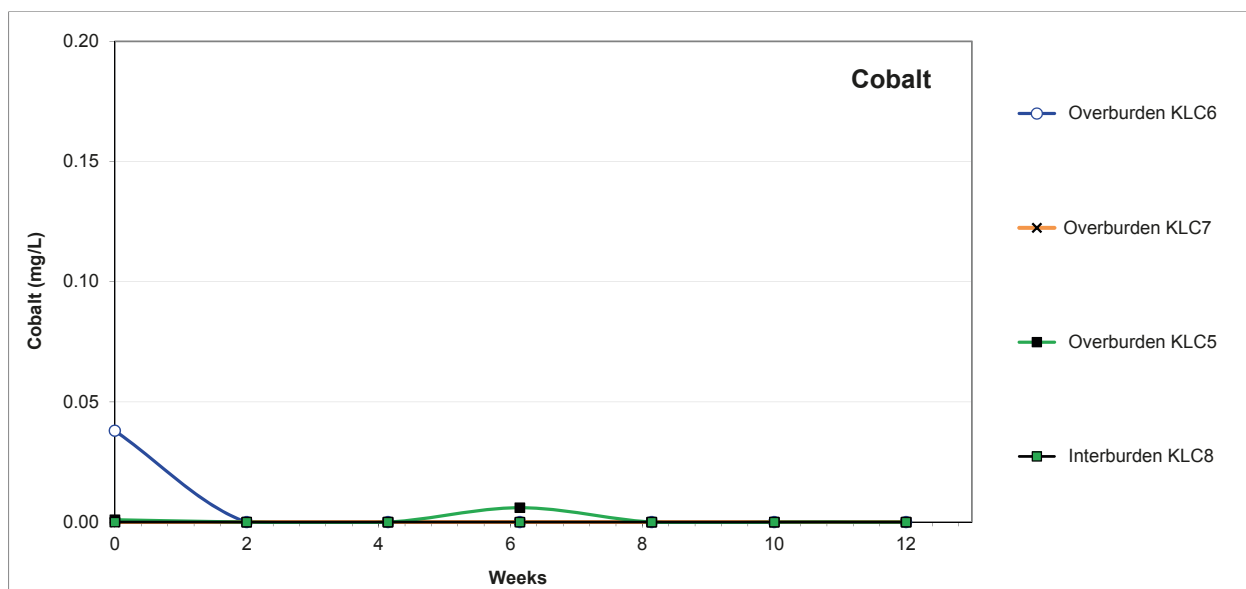
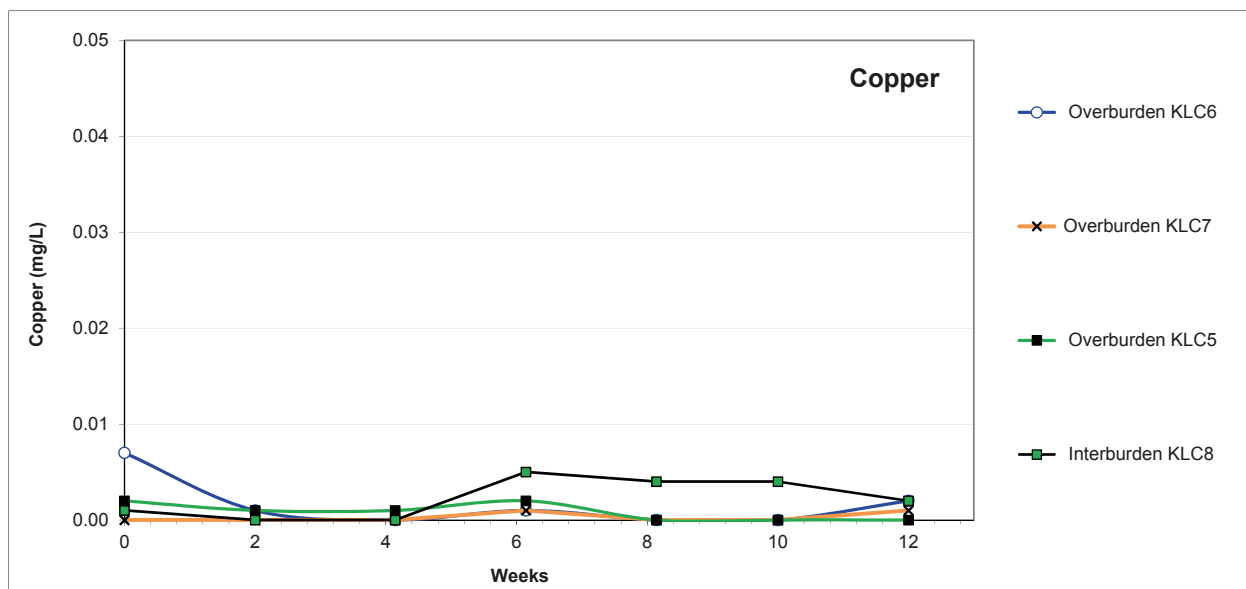
Guideline Limits refer to ANZECC (2000), Livestock Drinking Waters.

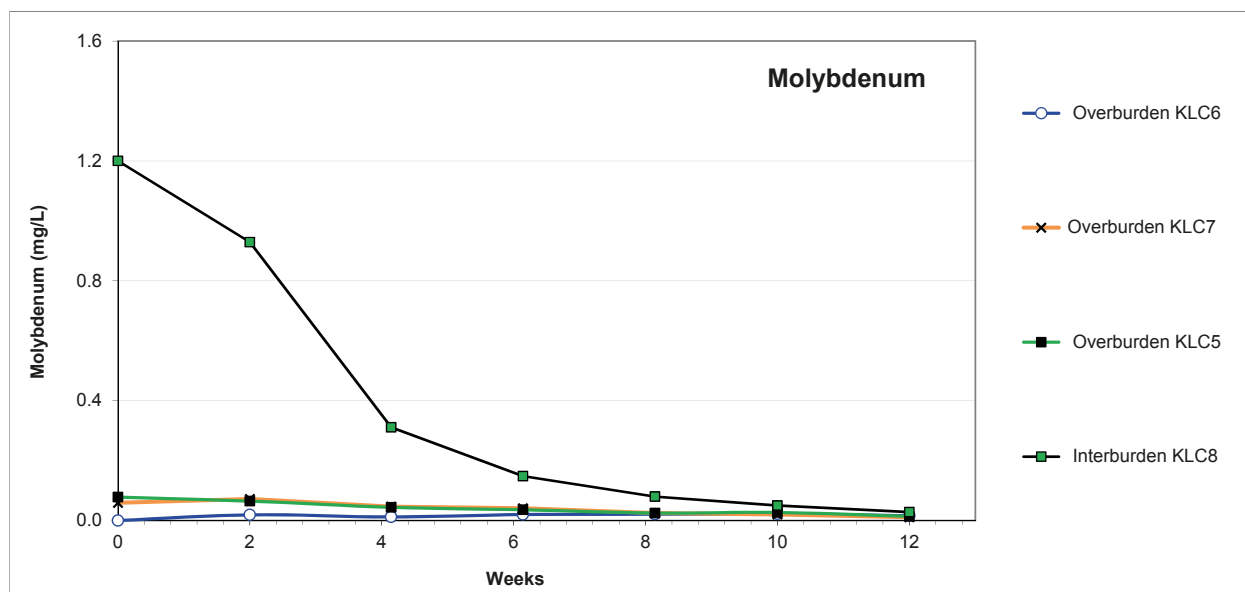
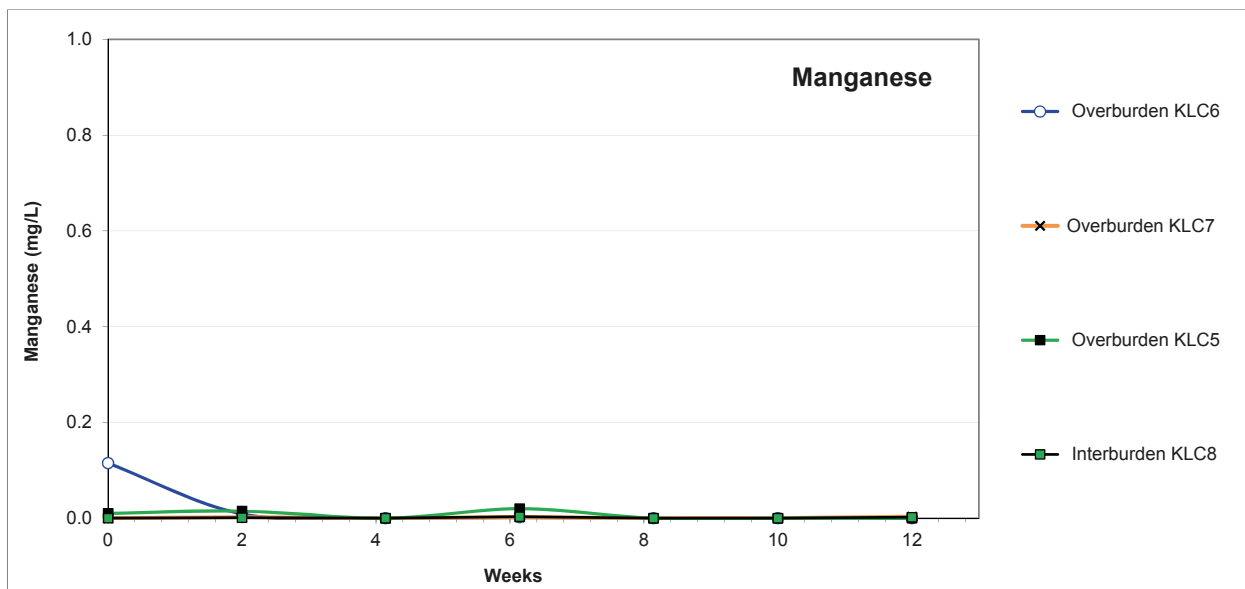
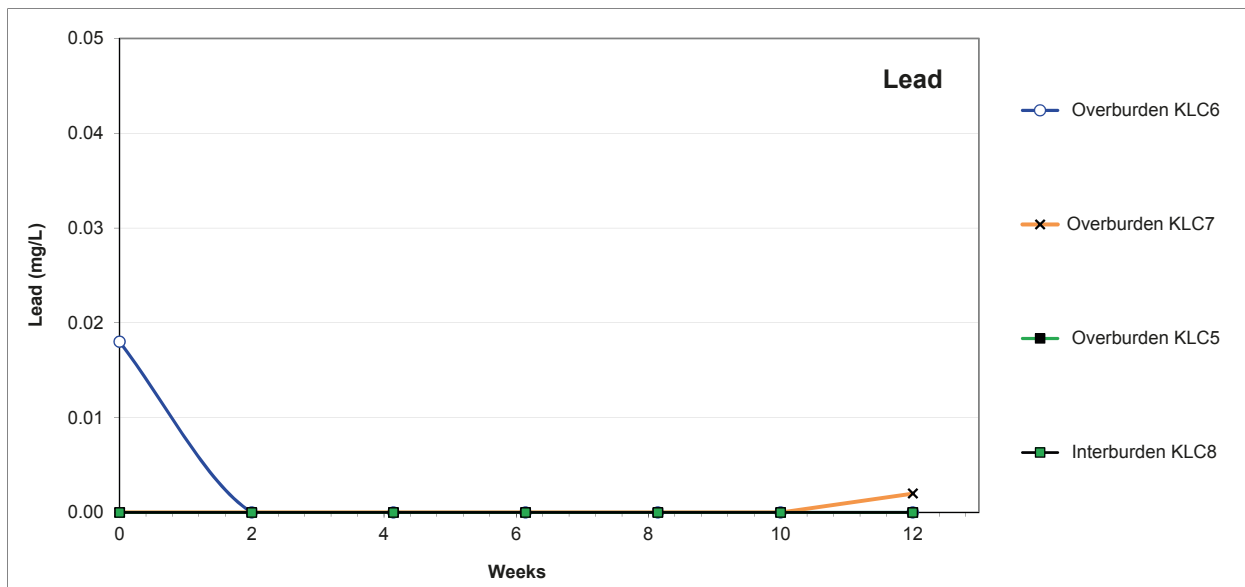
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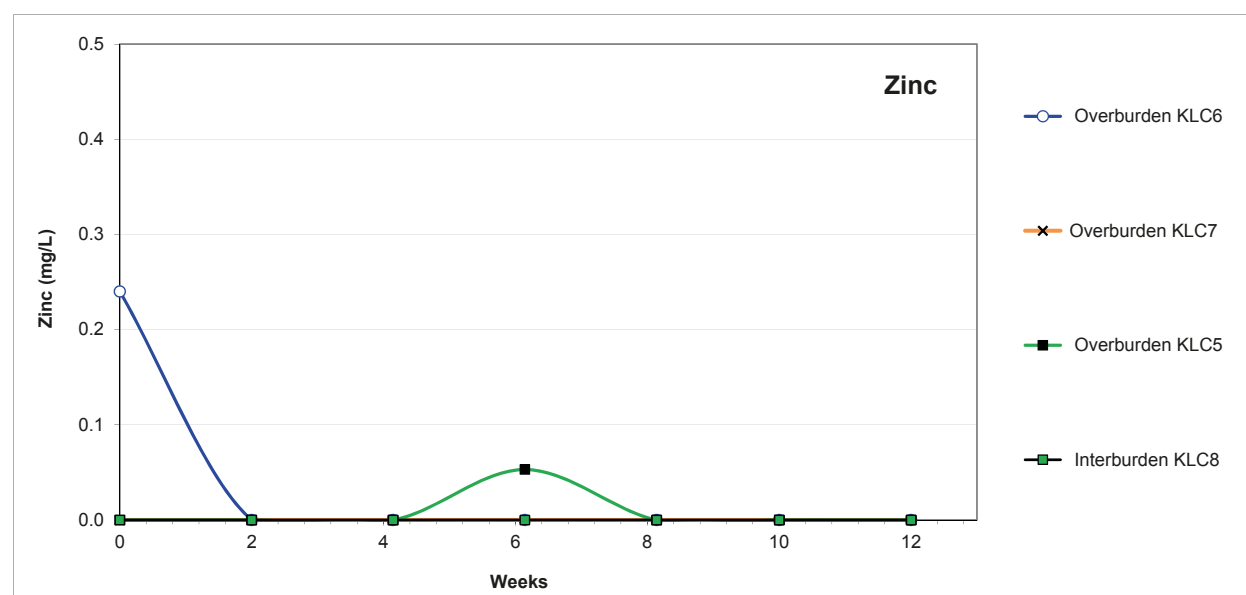
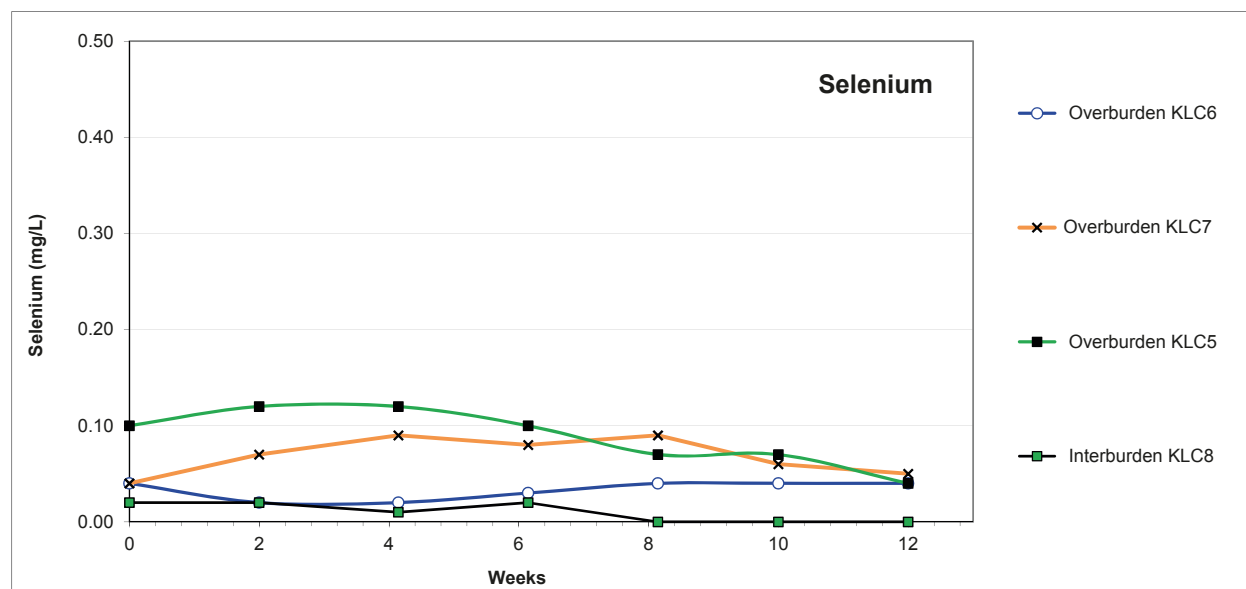
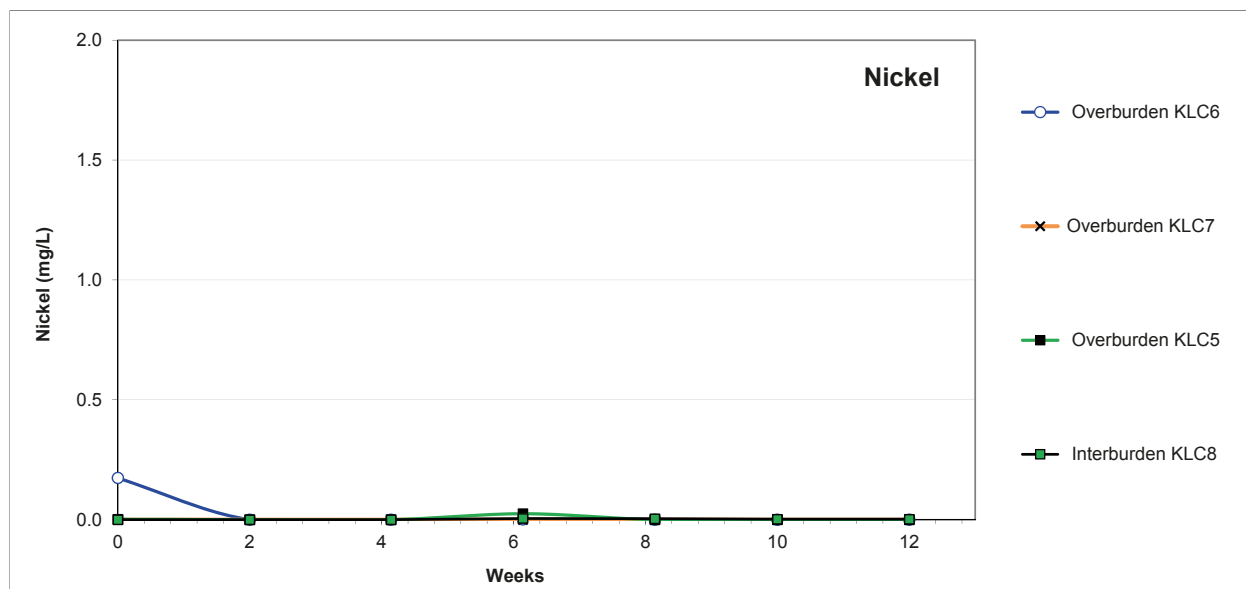












RGS-KLC # 1: Project Stone

KLC Test Results: Raw Coal (1)

		Weight (kg)	1.24	Total S (%)	0.192	ANC	30.32	
		pH (1:5)	6.95	Scr (%)	-	NAPP	-24.44	
		EC (µS/cm)	582	MPA	5.88	ANC:MPA	5.16	
Date		27-Jul-12	10-Aug-12	24-Aug-12	7-Sep-12	21-Sep-12	5-Oct-12	19-Oct-12
Week		0	2	4	6	8	10	12
Leach Number		1	2	3	4	5	6	7
ALS Laboratory ID		EB1219839	EB1221260	EB1222376	EB1223753	EB1225114	EB1225944	EB1227323
Volume Collected (L)		0.699	0.758	0.804	0.752	0.741	0.754	0.748
Cum. Volume (L)		0.70	1.46	2.26	3.01	3.75	4.51	5.26
Pore Volumes		0.5	1.1	1.7	2.2	2.8	3.3	3.9
pH		7.04	7.60	6.97	7.53	7.30	7.23	7.33
EC (mS/cm)		167	152	139	188	147	142	112
Acidity (mg/L)*		2	3	3	2	2	2	2
Alkalinity (mg/L)*		26	9	11	6	6	7	6
Net Alkalinity (mg/L)*		24	6	8	4	4	5	4
Dissolved elements	Guideline							
(mg/L)	Limits #							
Aluminium (Al)	5	<0.01	0.01	<0.05	0.03	0.06	0.07	0.13
Arsenic (As)	0.5	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
Boron (B)	5	0.08	0.08	0.15	0.15	0.17	0.17	0.13
Calcium (Ca)	1,000	13	5	3	4	3	3	2
Cadmium (Cd)	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride (Cl)	-	2	2	2	3	2	2	1
Cobalt (Co)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	1	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	1	0.002	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Iron (Fe)	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium (K)	-	<1	<1	<1	<1	<1	<1	<1
Magnesium (Mg)	-	1	<1	<1	<1	<1	<1	<1
Manganese (Mn)	-	0.066	0.015	0.007	0.004	0.002	<0.001	0.004
Molybdenum (Mo)	0.15	<0.001	0.002	0.002	0.002	0.002	0.002	0.002
Sodium (Na)	-	15	21	21	26	23	21	15
Nickel (Ni)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (P)	-	1.06	0.20	<0.01	0.22	0.10	0.15	0.13
Lead (Pb)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfate (SO₄)	1,000	46	46	42	59	41	36	28
Antimony (Sb)	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.02	<0.01	0.03	0.03	0.03	0.02	0.02	<0.01
Vanadium (V)	-	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01
Zinc (Zn)	20	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calculations**								
SO₄ Release Rate		26	28	27	36	25	22	17
Cumulative SO₄ Release		26	54	81	117	142	163	180
Ca Release Rate		7.3	3.1	1.9	2.4	1.8	1.8	1.2
Cumulative Ca Release		7.3	10.4	12.3	14.8	16.5	18.4	19.6
Mg Release Rate		0.6	0.3	0.3	0.3	0.3	0.3	0.3
Cumulative Mg Release		0.6	0.9	1.2	1.5	1.8	2.1	2.4
Residual ANC (%)		99.93	99.90	99.88	99.86	99.84	99.82	99.81
Residual Sulfur (%)		99.55	99.06	98.59	97.97	97.54	97.16	96.87
SO₄/(Ca+Mg) molar ratio		1.3	3.3	4.6	5.1	4.5	3.9	4.1

< indicates less than the analytical detection limit. * Acidity and alkalinity data calculated in mg CaCO₃/L.

** SO₄, Ca and Mg release rates calculated in mg/kg/flush.

Total S = Total Sulfur; CRS = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity

MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential

Guideline Limits refer to ANZECC (2000), Livestock Drinking Waters.

A 'dash' represents no trigger value provided for this element.

RGS-KLC # 2: Project Stone
KLC Test Results: Raw Coal (2)

	Weight (kg)	1.56	Total S (%)	0.320	ANC	23.66		
	pH (1:5)	5.19	Scr (%)	0.2868	NAPP	-14.88		
	EC (µS/cm)	604	MPA	8.78	ANC:MPA	2.69		
Date	27-Jul-12	10-Aug-12	24-Aug-12	7-Sep-12	21-Sep-12	5-Oct-12	19-Oct-12	
Week	0	2	4	6	8	10	12	
Leach Number	1	2	3	4	5	6	7	
ALS Laboratory ID	EB1219839	EB1221260	EB1222376	EB1223753	EB1225114	EB1225944	EB1227323	
Volume Collected (L)	0.618	0.706	0.738	0.701	0.697	0.706	0.678	
Cum. Volume (L)	0.62	1.32	2.06	2.76	3.46	4.17	4.84	
Pore Volumes	0.5	1.0	1.5	2.0	2.6	3.1	3.6	
pH	7.05	7.51	7.29	7.52	7.32	7.31	7.31	
EC (mS/cm)	517	271	245	238	194	176	155	
Acidity (mg/L)*	2	3	2	3	2	2	2	
Alkalinity (mg/L)*	64	16	16	13	14	16	16	
Net Alkalinity (mg/L)*	62	13	14	10	12	14	14	
Dissolved elements (mg/L)	Guideline Limits #							
Aluminium (Al)	5	<0.01	<0.01	0.03	0.06	0.30	0.13	0.46
Arsenic (As)	0.5	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	5	0.28	0.18	0.23	0.27	0.26	0.21	0.19
Calcium (Ca)	1,000	14	5	4	4	3	3	2
Cadmium (Cd)	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride (Cl)	-	6	4	4	7	3	3	2
Cobalt (Co)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	1	0.006	<0.001	0.001	<0.001	0.001	<0.001	<0.001
Iron (Fe)	-	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	0.06
Potassium (K)	-	3	1	2	1	1	<1	<1
Magnesium (Mg)	-	2	<1	<1	<1	<1	<1	<1
Manganese (Mn)	-	0.044	0.012	0.009	0.007	0.006	0.005	0.004
Molybdenum (Mo)	0.15	0.012	0.010	0.010	0.008	0.009	0.007	0.007
Sodium (Na)	-	85	46	42	38	31	28	25
Nickel (Ni)	1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (P)	-	1.80	0.08	0.01	0.08	0.07	0.07	0.11
Lead (Pb)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfate (SO₄)	1,000	113	101	86	69	46	37	37
Antimony (Sb)	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.02	0.05	0.05	0.05	0.04	0.02	0.02	0.02
Vanadium (V)	-	<0.01	<0.01	<0.01	0.01	0.02	0.02	0.03
Zinc (Zn)	20	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calculations**								
SO₄ Release Rate		45	46	41	31	21	17	16
Cumulative SO₄ Release		45	90	131	162	183	199	216
Ca Release Rate		5.5	2.3	1.9	1.8	1.3	1.4	0.9
Cumulative Ca Release		5.5	7.8	9.7	11.5	12.8	14.2	15.1
Mg Release Rate		0.8	0.2	0.2	0.2	0.2	0.2	0.2
Cumulative Mg Release		0.8	1.0	1.3	1.5	1.7	1.9	2.1
Residual ANC (%)		99.93	99.90	99.88	99.86	99.84	99.82	99.81
Residual Sulfur (%)		99.53	99.06	98.63	98.31	98.09	97.92	97.75
SO₄/(Ca+Mg) molar ratio		2.7	7.2	7.4	6.0	5.0	4.0	5.5

< indicates less than the analytical detection limit. * Acidity and alkalinity data calculated in mg CaCO₃/L.

** SO₄, Ca and Mg release rates calculated in mg/kg/flush.

Total S = Total Sulfur; CRS = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity

MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential

Guideline Limits refer to ANZECC (2000), Livestock Drinking Waters.

A 'dash' represents no trigger value provided for this element.

RGS-KLC # 3: Project Stone

KLC Test Results: Coarse Reject Composite 1

	Weight (kg)	1.82	Total S (%)	0.567	ANC	38.45	
	pH (1:5)	3.84	Scr (%)	-	NAPP	-21.08	
	EC (µS/cm)	1,343	MPA	17.37	ANC:MPA	2.21	
Date	27-Jul-12	10-Aug-12	24-Aug-12	7-Sep-12	21-Sep-12	5-Oct-12	19-Oct-12
Week	0	2	4	6	8	10	12
Leach Number	1	2	3	4	5	6	7
ALS Laboratory ID	EB1219839	EB1221260	EB1222376	EB1223753	EB1225114	EB1225944	EB1227323
Volume Collected (L)	0.583	0.905	0.740	0.705	0.695	0.721	0.679
Cum. Volume (L)	0.58	1.49	2.23	2.93	3.63	4.35	5.03
Pore Volumes	0.5	1.3	1.9	2.6	3.2	3.8	4.4
pH	5.86	6.98	6.61	7.01	6.89	7.33	6.89
EC (mS/cm)	2,238	1,702	1,575	1,314	1,013	809	771
Acidity (mg/L)*	24	3	3	3	3	2	2
Alkalinity (mg/L)*	28	12	10	11	11	15	9
Net Alkalinity (mg/L)*	4	9	7	8	8	13	7
Dissolved elements (mg/L)	Guideline Limits #						
Aluminium (Al)	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic (As)	0.5	0.020	0.024	0.017	0.014	<0.001	<0.001
Boron (B)	5	0.26	0.11	0.15	0.16	0.17	0.15
Calcium (Ca)	1,000	159	152	137	120	99	150
Cadmium (Cd)	0.01	0.0007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride (Cl)	-	374	408	274	144	59	53
Cobalt (Co)	1	0.021	0.002	0.001	<0.001	<0.001	<0.001
Chromium (Cr)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	1	0.001	0.001	0.002	0.003	0.002	0.001
Iron (Fe)	-	6.94	<0.05	0.67	<0.05	<0.05	<0.05
Potassium (K)	-	12	9	11	8	8	7
Magnesium (Mg)	-	30	24	22	18	15	21
Manganese (Mn)	-	0.785	0.297	0.285	0.210	0.200	0.246
Molybdenum (Mo)	0.15	<0.001	0.004	0.005	0.004	0.004	0.004
Sodium (Na)	-	252	179	163	121	93	105
Nickel (Ni)	1	0.015	<0.001	0.001	<0.001	<0.001	<0.001
Phosphorus (P)	-	0.10	0.02	<0.01	<0.01	0.05	<0.01
Lead (Pb)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfate (SO ₄)	1,000	809	395	440	462	359	612
Antimony (Sb)	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.02	0.17	0.20	0.17	0.11	0.04	0.11
Vanadium (V)	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc (Zn)	20	0.110	0.006	<0.005	<0.005	<0.005	<0.005
Calculations**							
SO₄ Release Rate	259	196	179	179	137	242	114
Cumulative SO₄ Release	259	456	634	813	951	1193	1307
Ca Release Rate	50.9	75.6	55.7	46.5	37.8	59.4	32.5
Cumulative Ca Release	50.9	126.5	182.2	228.7	266.5	325.9	358.4
Mg Release Rate	9.6	11.9	8.9	7.0	5.7	8.3	4.5
Cumulative Mg Release	9.6	21.5	30.5	37.5	43.2	51.5	56.0
Residual ANC (%)	99.58	98.97	98.52	98.15	97.85	97.39	97.13
Residual Sulfur (%)	98.47	97.32	96.27	95.21	94.41	92.98	92.31
SO₄/(Ca+Mg) molar ratio	1.6	0.9	1.1	1.3	1.2	1.4	1.2

< indicates less than the analytical detection limit. * Acidity and alkalinity data calculated in mg CaCO₃/L.

** SO₄, Ca and Mg release rates calculated in mg/kg/flush.

Total S = Total Sulfur; CRS = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity

MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential

Guideline Limits refer to ANZECC (2000), Livestock Drinking Waters.

A 'dash' represents no trigger value provided for this element.

RGS-KLC # 4: Project Stone

KLC Test Results: Coarse Reject Composite 2

	Weight (kg)	1.45	Total S (%)	0.082	ANC	28.58		
	pH (1:5)	5.42	Scr (%)	-	NAPP	-26.08		
	EC (µS/cm)	723	MPA	2.50	ANC:MPA	11.42		
Date	27-Jul-12	10-Aug-12	24-Aug-12	7-Sep-12	21-Sep-12	5-Oct-12	19-Oct-12	
Week	0	2	4	6	8	10	12	
Leach Number	1	2	3	4	5	6	7	
ALS Laboratory ID	EB1219839	EB1221260	EB1222376	EB1223753	EB1225114	EB1225944	EB1227323	
Volume Collected (L)	0.629	0.690	0.741	0.707	0.696	0.730	0.683	
Cum. Volume (L)	0.63	1.32	2.06	2.77	3.46	4.19	4.88	
Pore Volumes	0.5	1.0	1.5	2.0	2.6	3.1	3.6	
pH	6.51	7.12	7.01	7.12	7.21	7.35	7.28	
EC (mS/cm)	1,197	483	436	466	287	306	189	
Acidity (mg/L)*	3	2	3	3	3	2	2	
Alkalinity (mg/L)*	43	6	4	7	7	11	11	
Net Alkalinity (mg/L)*	40	4	1	4	4	9	9	
Dissolved elements (mg/L)	Guideline Limits #							
Aluminium (Al)	5	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.12
Arsenic (As)	0.5	0.015	0.006	0.006	0.008	<0.001	0.003	<0.001
Boron (B)	5	0.24	0.10	0.14	0.22	0.20	0.19	0.15
Calcium (Ca)	1,000	72	26	22	23	13	15	8
Cadmium (Cd)	0.01	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chloride (Cl)	-	360	139	106	94	41	41	30
Cobalt (Co)	1	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	1	0.002	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Iron (Fe)	-	<0.05	<0.05	0.12	<0.05	<0.05	<0.05	<0.05
Potassium (K)	-	20	8	10	9	8	6	5
Magnesium (Mg)	-	21	8	7	7	4	4	2
Manganese (Mn)	-	0.045	0.020	0.026	0.046	0.030	0.050	0.025
Molybdenum (Mo)	0.15	0.002	0.003	0.004	0.005	0.005	0.005	0.005
Sodium (Na)	-	103	42	40	44	29	28	19
Nickel (Ni)	1	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (P)	-	0.09	<0.01	<0.01	0.02	0.03	0.03	0.03
Lead (Pb)	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfate (SO₄)	1,000	108	34	42	95	44	65	37
Antimony (Sb)	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.02	0.16	0.09	0.09	0.08	0.03	0.09	0.02
Vanadium (V)	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc (Zn)	20	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calculations**								
SO₄ Release Rate		47	16	21	46	21	33	17
Cumulative SO₄ Release		47	63	84	131	152	185	202
Ca Release Rate		31.2	12.4	11.2	11.2	6.2	7.6	3.8
Cumulative Ca Release		31.2	43.6	54.8	66.1	72.3	79.9	83.6
Mg Release Rate		9.1	3.8	3.6	3.4	1.9	2.0	0.9
Cumulative Mg Release		9.1	12.9	16.5	19.9	21.8	23.8	24.8
Residual ANC (%)		99.60	99.44	99.30	99.15	99.07	98.98	98.93
Residual Sulfur (%)		98.09	97.43	96.55	94.66	93.79	92.46	91.74
SO₄/(Ca+Mg) molar ratio		0.4	0.4	0.5	1.1	0.9	1.3	1.4

< indicates less than the analytical detection limit. * Acidity and alkalinity data calculated in mg CaCO₃/L.

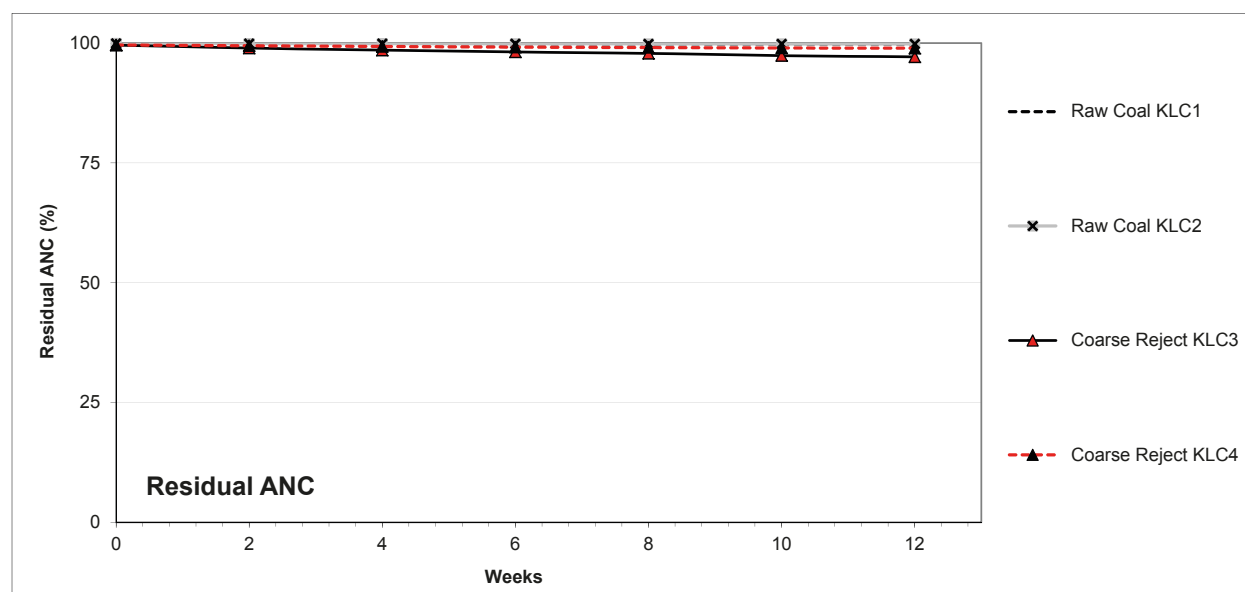
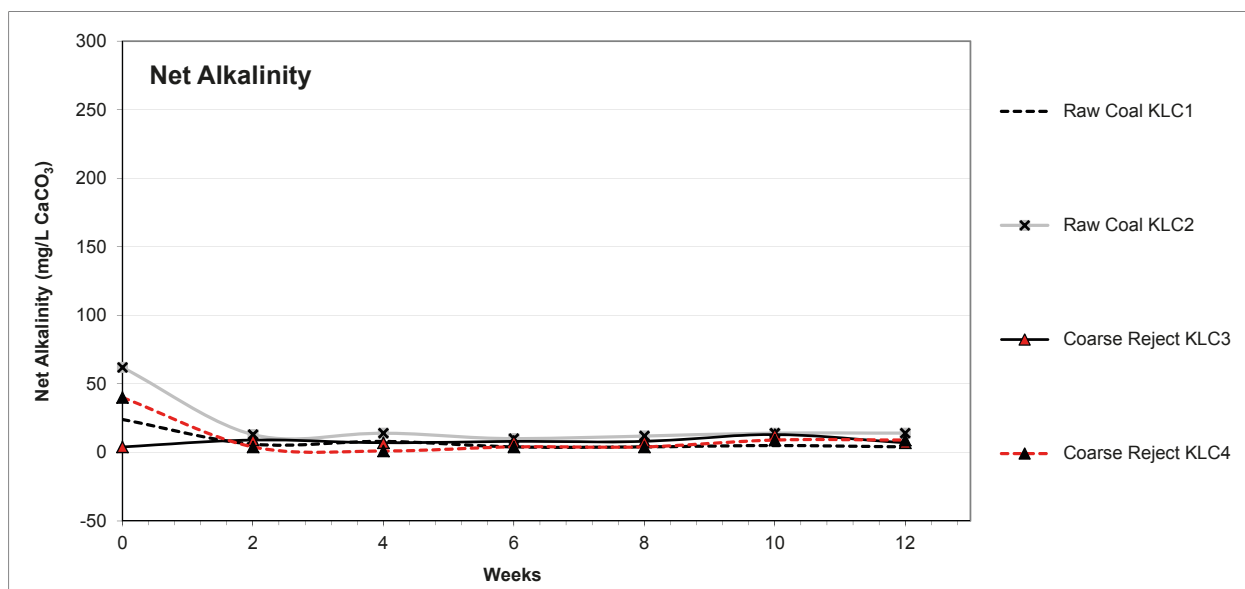
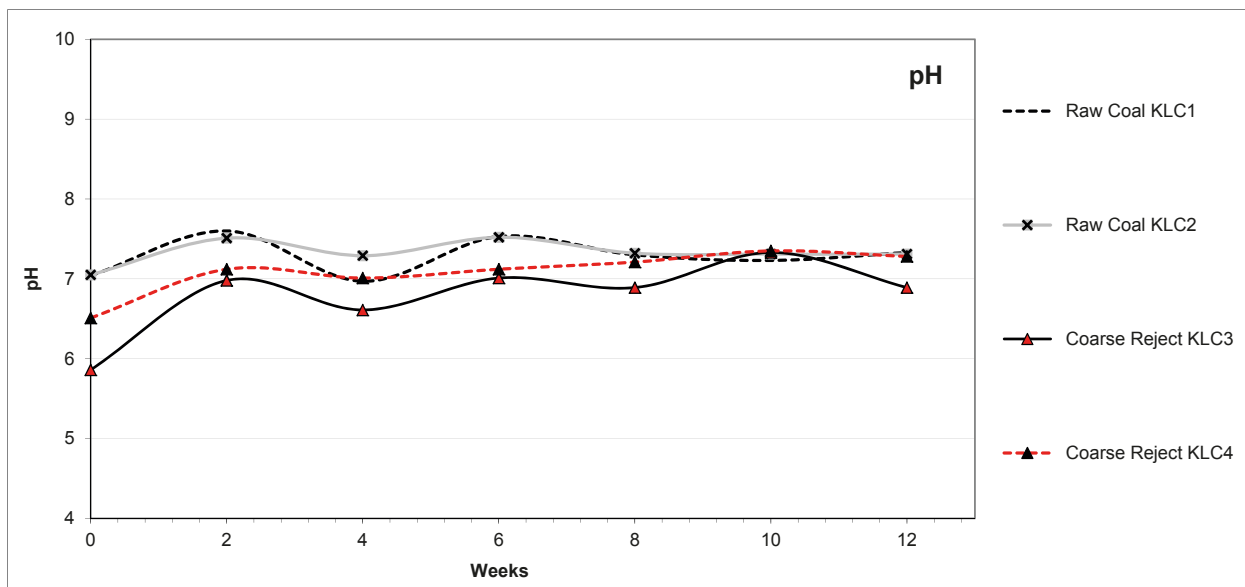
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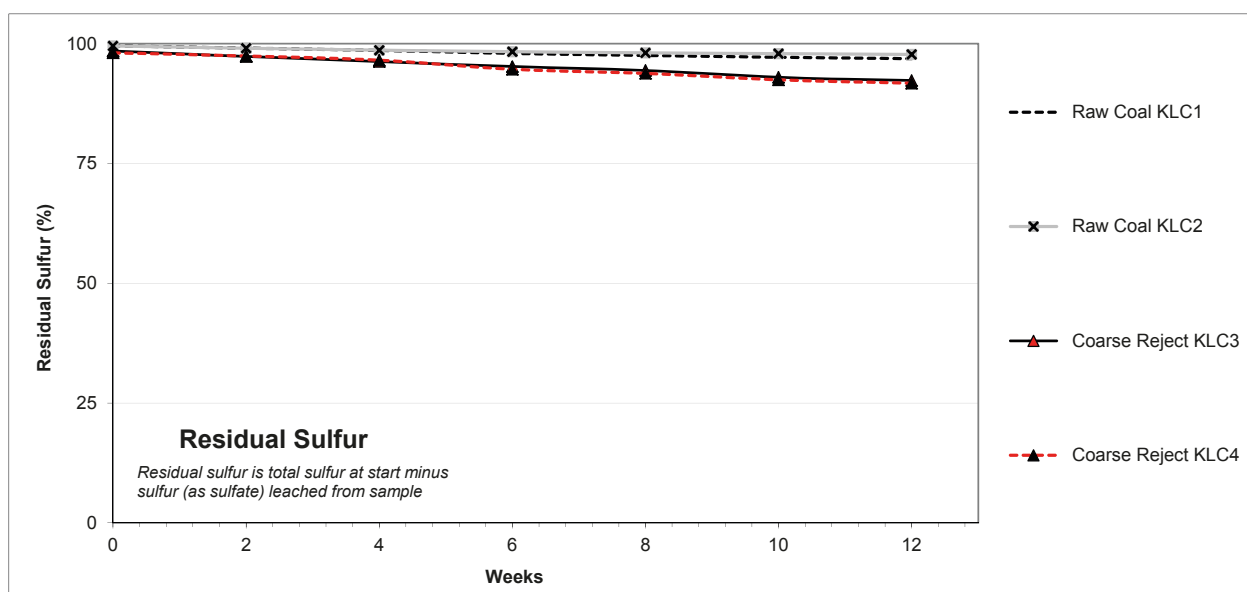
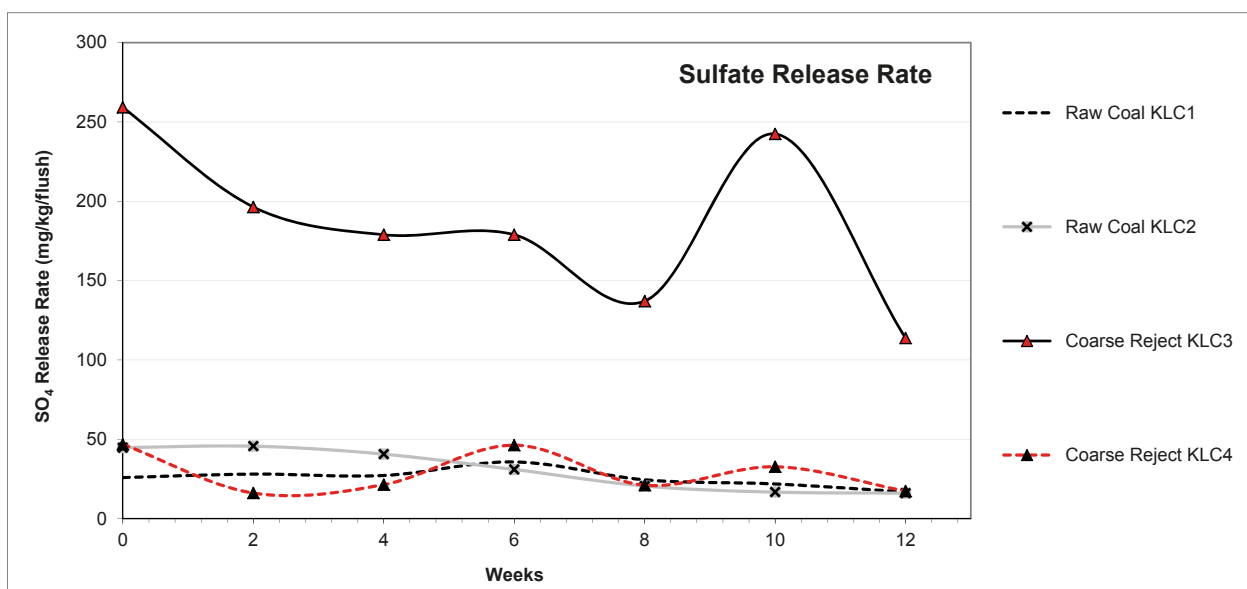
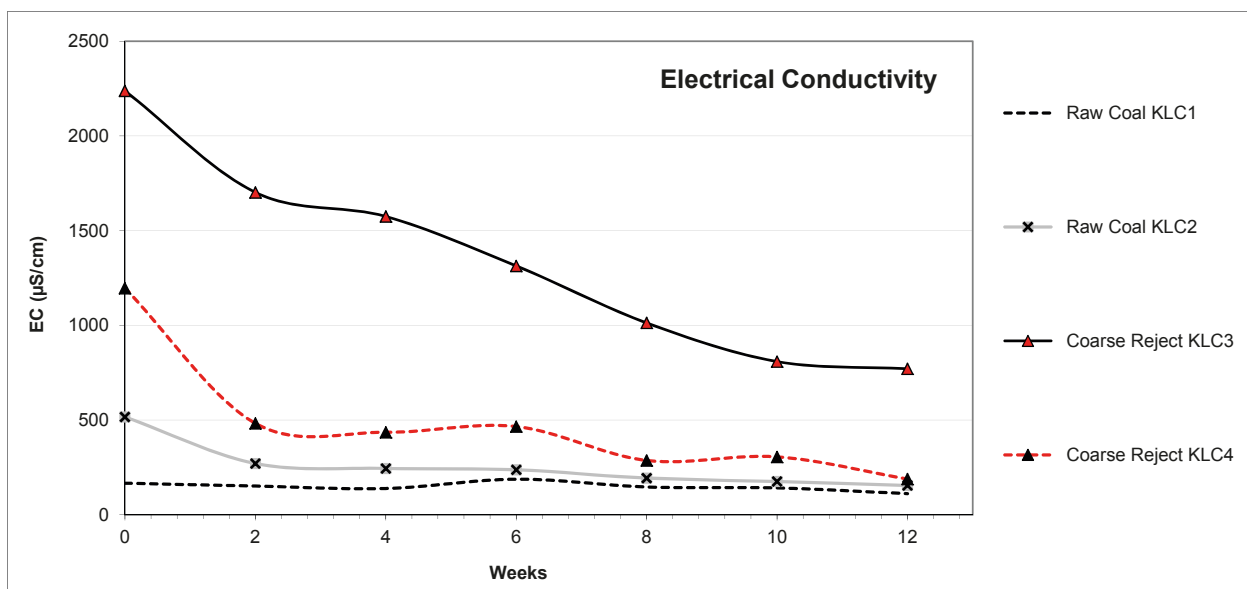
Total S = Total Sulfur; CRS = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity

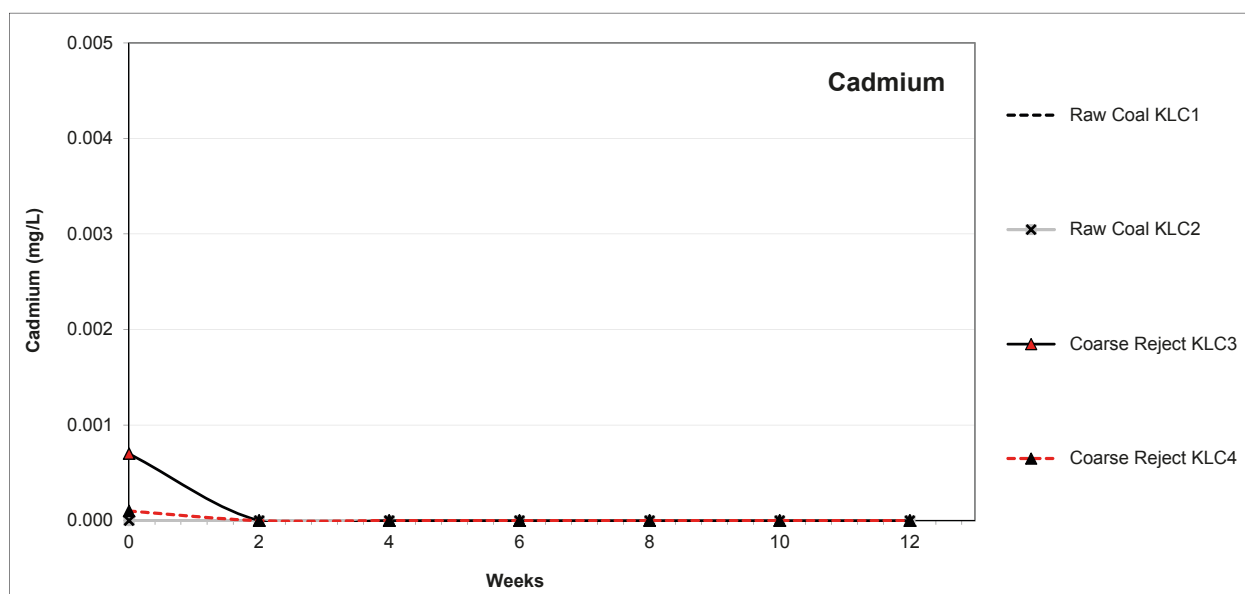
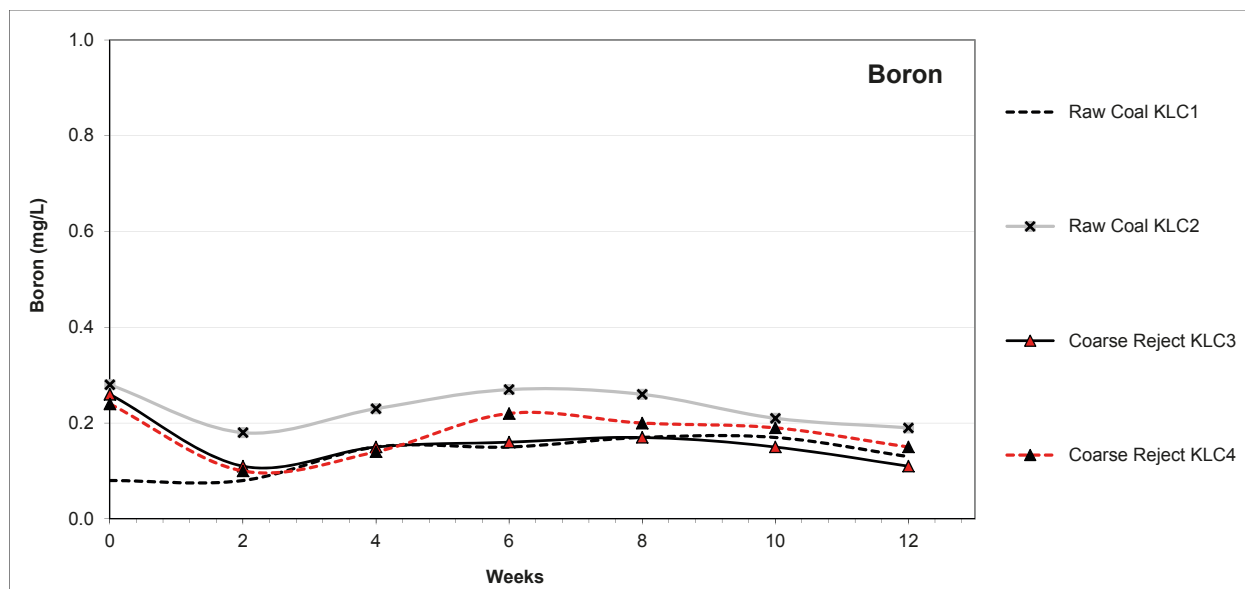
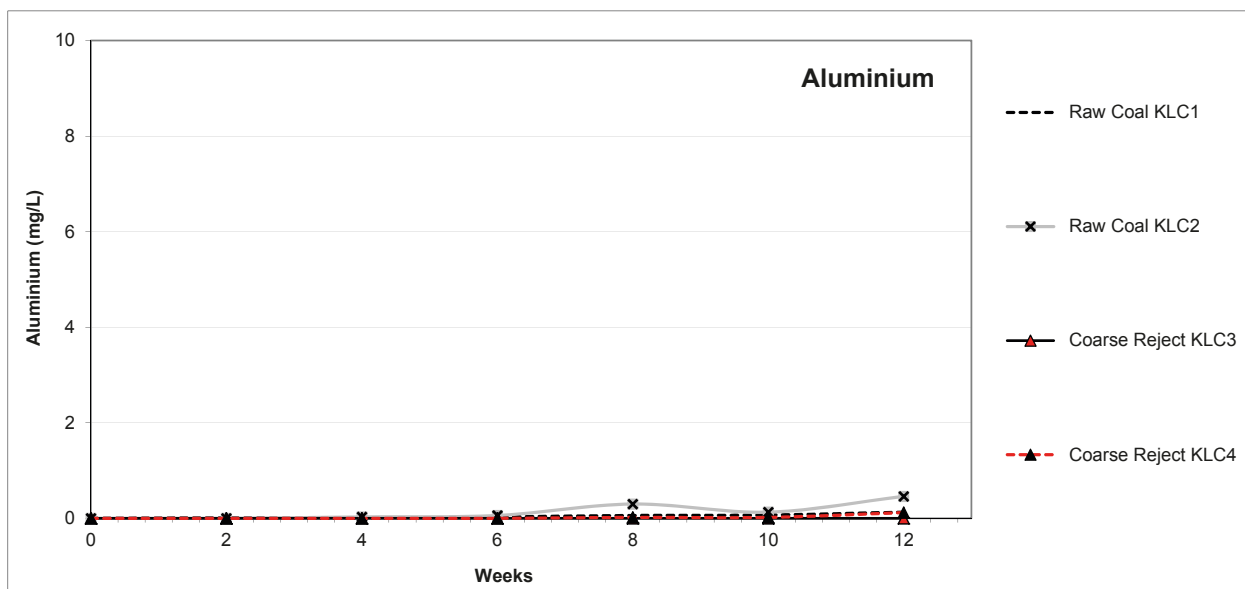
MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential

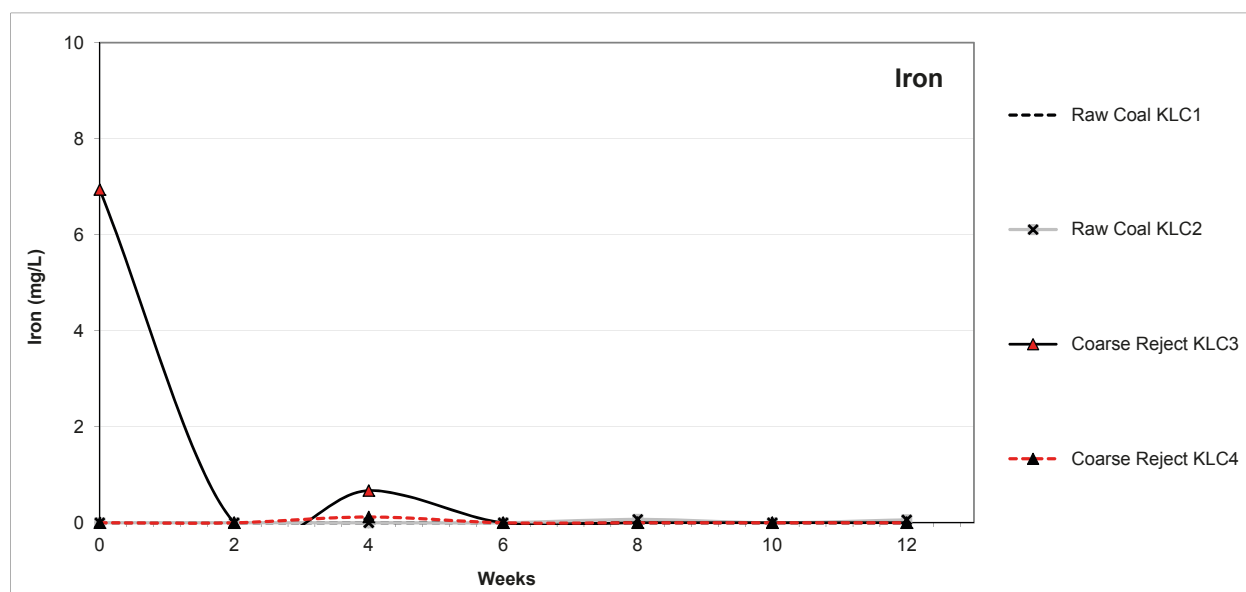
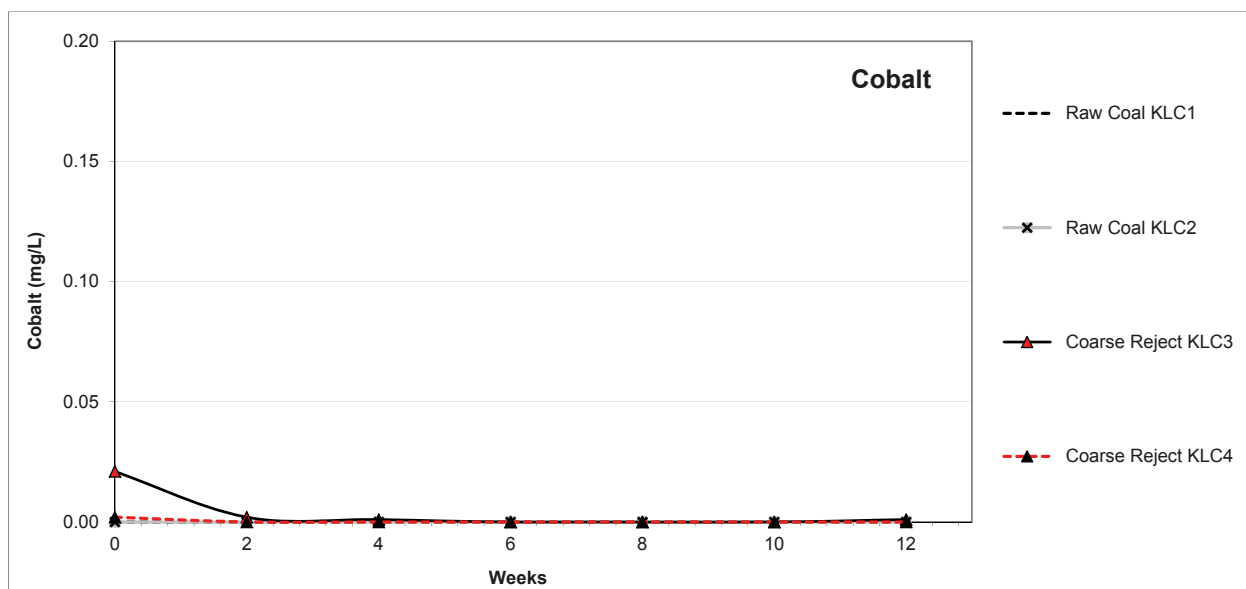
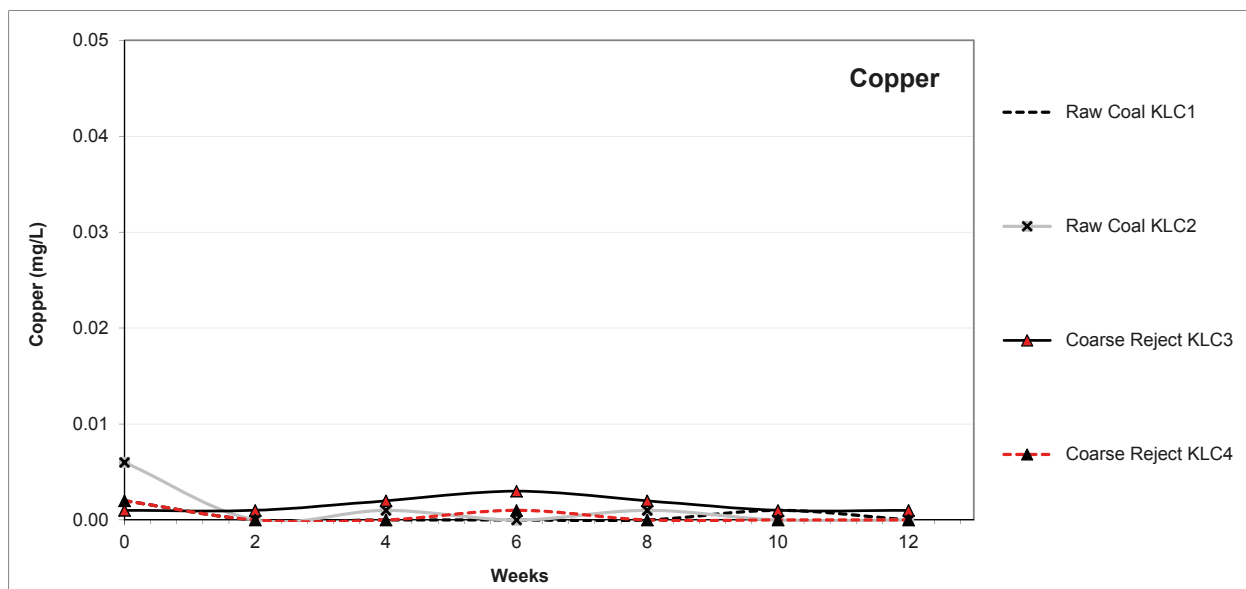
Guideline Limits refer to ANZECC (2000), Livestock Drinking Waters.

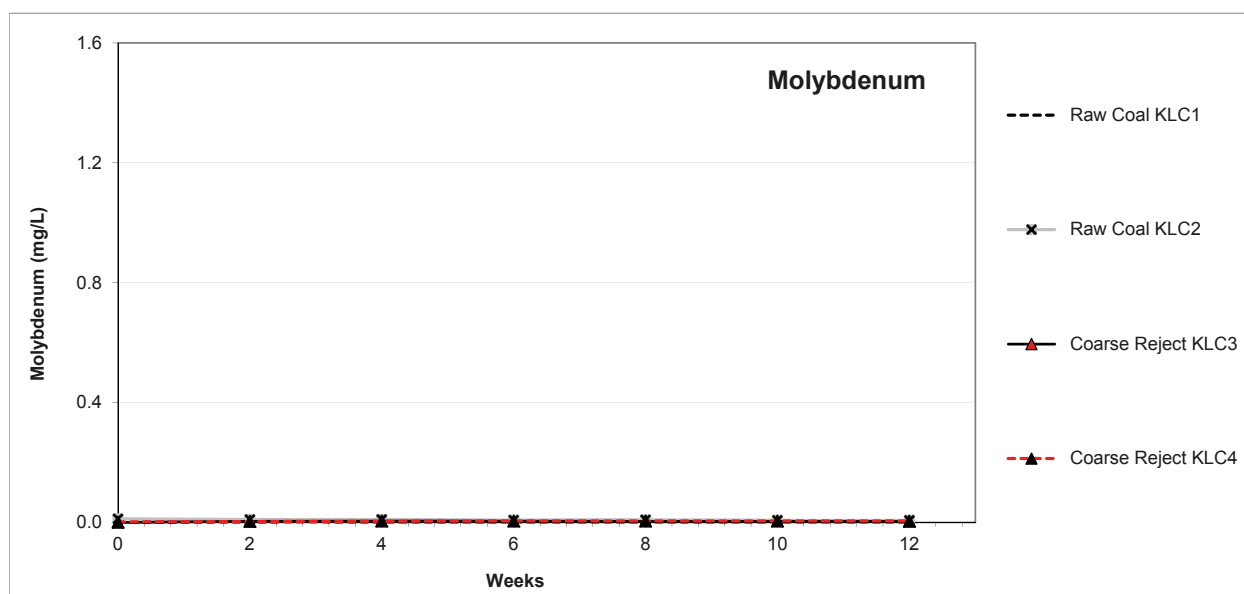
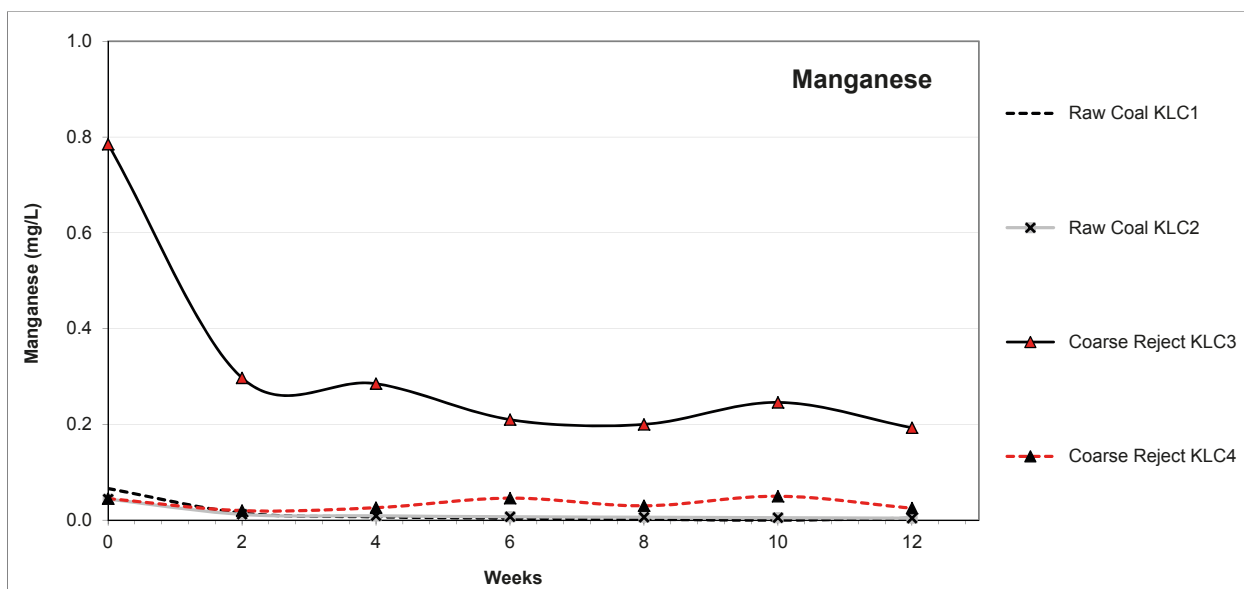
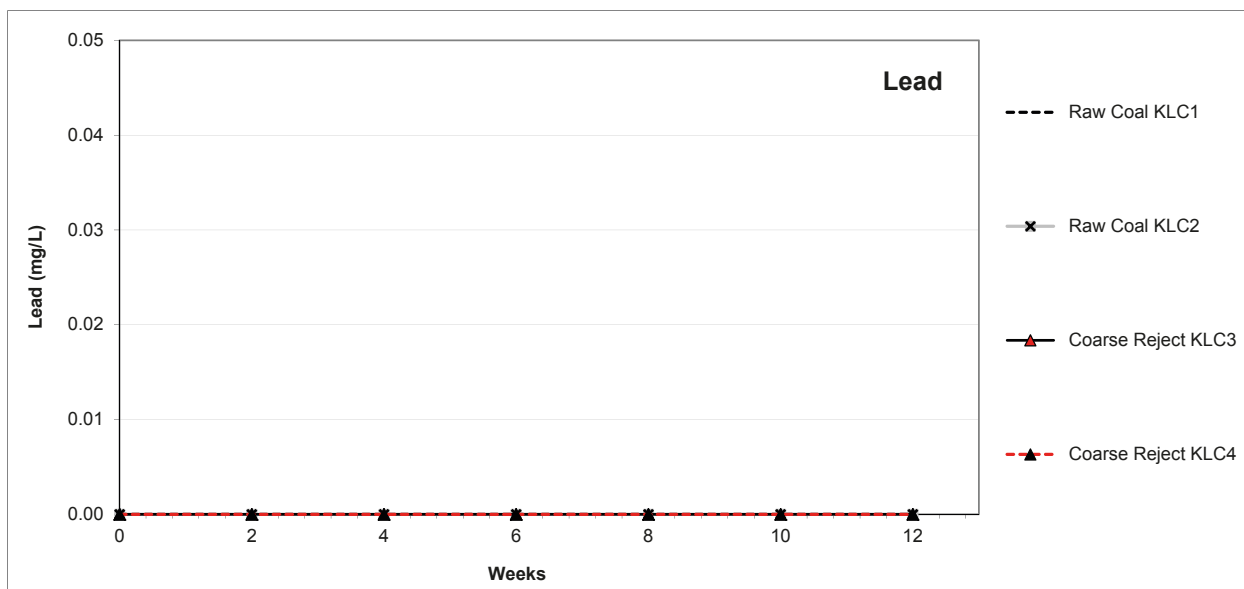
A 'dash' represents no trigger value provided for this element.

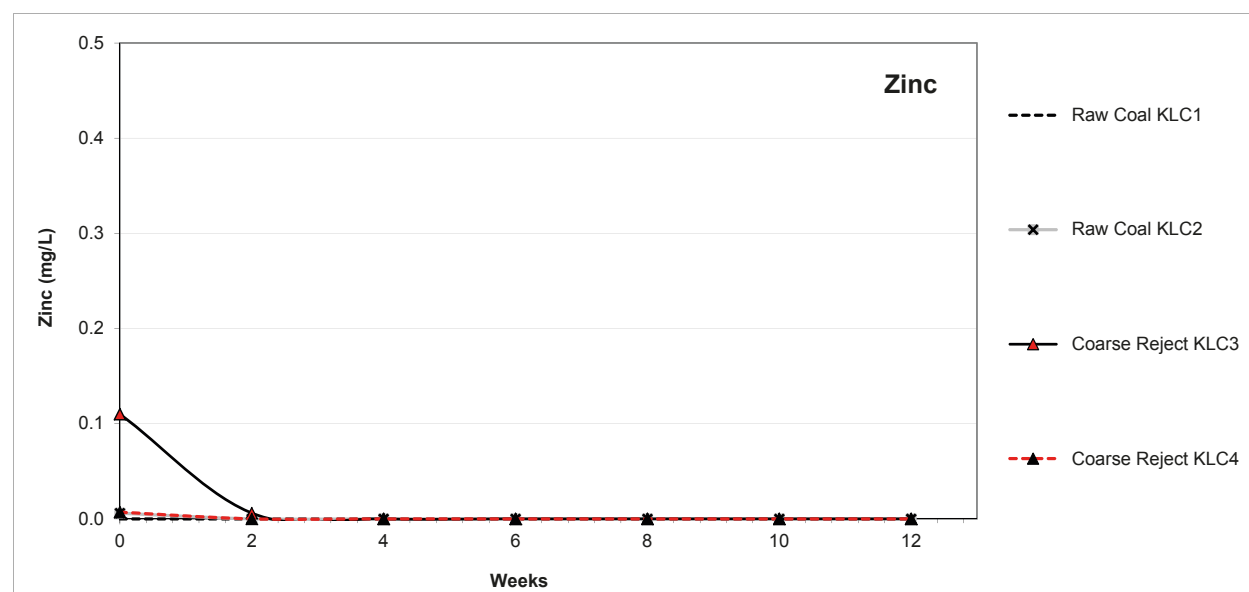
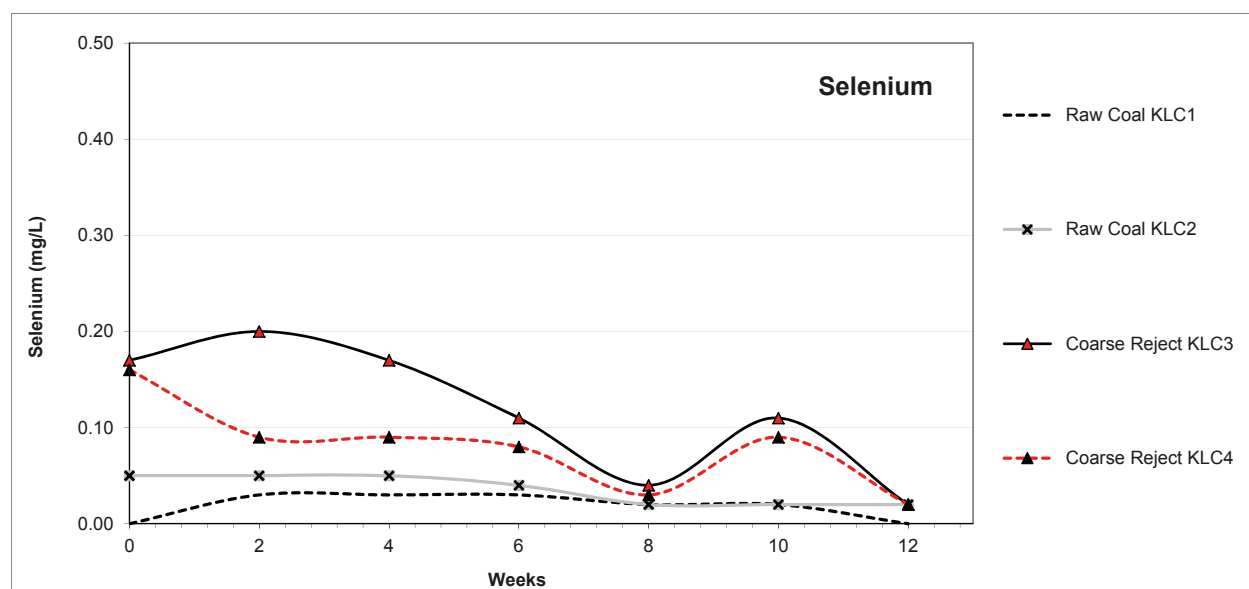
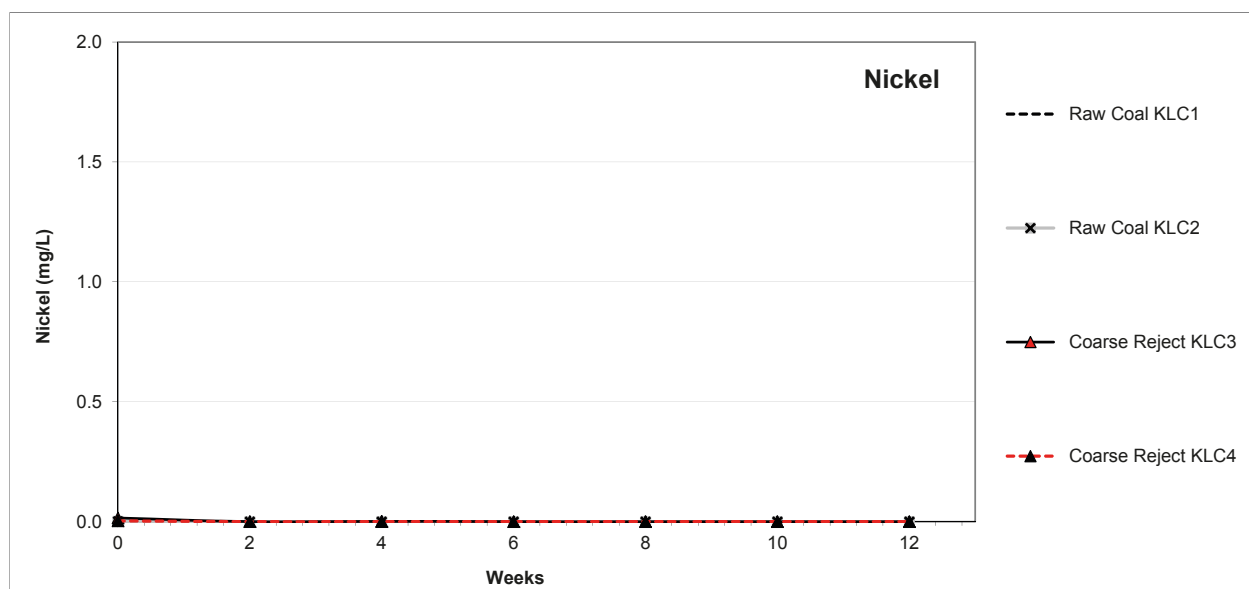












Project China Stone

Sample ID Leach event Week Leaching fluid Leaching date Total solid mass at start (g) Leachate added = DI water (mL) Leachate recovered (mL) Laboratory batch (ALS Reference No.)					Coal Ash-1 (KLC9)						
					L1	L2	L3	L4	L5	L6	L7
					0	4	9	13	17	22	26
					DI Water	DI Water	DI Water	DI Water	DI Water	DI Water	DI Water
					04/11/13	04/12/13	04/01/14	04/02/14	04/03/14	05/04/14	05/05/14
					717	717	717	717	717	717	717
Leachate added = DI water (mL)					1,400	1,400	1,400	1,400	1,400	1,400	1,400
Leachate recovered (mL)					617	625	597	608	680	810	697
Laboratory batch (ALS Reference No.)					EB1326893	EB1330008	EB1400138	EB1402472	EB1405142	EB1408267	EB1410823
Analyte	LOR	Units	Aquatic Ecosystems ¹	Livestock Drinking ²							
Physico-Chemical											
pH (DI water)	0.01	ph unit	-	-	6.64	5.63	6.55	6.50	6.22	6.16	6.07
Electrical Conductivity (DI water)	1	µs/cm	-	-	9.75	2.98	7.12	4.79	5.96	11.83	5.84
pH (leachate)	0.01	ph unit	6 to 9	-	9.45	8.18	7.36	7.44	7.38	7.34	6.86
Electrical Conductivity (leachate)	1	µs/cm	<1,000 [#]	3,580 [^]	1,867	1,722	1,552	888	811	726	559
Alkalinity and Acidity											
Bicarbonate Alkalinity as CaCO ₃	1	mg/L	-	-	3	24	35	26	25	34	24
Carbonate Alkalinity as CaCO ₃	1	mg/L	-	-	92	<1	<1	<1	<1	<1	<1
Hydroxide Alkalinity as CaCO ₃	1	mg/L	-	-	<1	<1	<1	<1	<1	<1	<1
Total Alkalinity as CaCO ₃	1	mg/L	-	-	96	24	35	26	25	34	24
Acidity as CaCO ₃	1	mg/L	-	-	<1	6	2	6	8	3	2
Net Alkalinity as CaCO ₃	1	mg/L	-	-	96	18	33	20	17	31	22
Major Ions											
Calcium (Ca) +	1	mg/L	-	1000	449	383	352	158	137	131	82
Magnesium (Mg) +	1	mg/L	-	-	5	28	44	26	22	21	13
Potassium (K) +	1	mg/L	-	-	7	2	2	1	1	<1	<1
Sodium (Na) +	1	mg/L	-	-	19	3	4	3	2	2	1
Sulfate (SO ₄) - turbidimetric	1	mg/L	-	1000	962	797	809	398	339	351	242
Chloride (Cl) -	1	mg/L	-	-	87	98	78	47	34	23	10
Fluoride (F) -	0.1	mg/L	-	2	1.0	2.7	3.1	2.3	1.9	1.5	1.3
Nutrients											
Ammonia as N	0.01	mg/L	0.9	-	0.13	0.03	0.02	0.02	<0.01	<0.01	0.02
Nitrate (NO ₃)	-	mg/L	0.7	400	-	-	-	-	-	-	-
Nitrite (NO ₂)	-	mg/L	-	30	-	-	-	-	-	-	-
Nitrate + Nitrite as N (NOX) **	0.01	mg/L	0.16	99.4	0.06	0.06	<0.01	0.07	0.07	0.08	0.12
Total Kjeldahl Nitrogen (TKN)	0.1	mg/L	-	-	0.50	<0.1	0.30	0.10	<0.1	<0.1	<0.1
Total Nitrogen as N (TKN + NOX)	0.1	mg/L	-	-	0.56	<0.1	0.30	0.17	<0.1	<0.1	0.12
Total Cyanide (CN)	0.004	mg/L	0.007	-	<0.004	<0.004	<0.004	-	-	-	-
Total Phosphorus as P	0.01	mg/L	-	-	0.05	0.02	0.01	0.02	0.01	<0.01	0.02
Metals and Metalloids											
Aluminium (Al)	0.01	mg/L	0.055	5	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Antimony (Sb)	0.001	mg/L	-	-	0.011	0.003	0.004	0.001	0.002	0.003	0.001
Arsenic (As) - pentavalent	0.001	mg/L	0.013*	0.5	0.010	0.008	0.006	0.004	0.003	0.003	0.002
Barium (Ba)	0.001	mg/L	-	-	0.142	0.055	0.040	0.029	0.020	0.02	0.01
Beryllium (Be)	0.001	mg/L	-	-	<0.001	<0.001	<0.001	-	-	-	-
Boron (B)	0.05	mg/L	0.37	5	3.33	1.08	1.26	0.84	1.02	0.95	0.54
Cadmium (Cd)	0.0001	mg/L	0.0002	0.01	0.0003	0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr - total)	0.001	mg/L	-	1	0.245	0.085	0.057	0.035	0.029	0.019	0.009
Chromium VI (Cr - hexavalent)	0.01	mg/L	0.001	-	0.26	0.11	0.07	0.04	0.04	0.02	<0.01
Cobalt (Co)	0.001	mg/L	-	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	0.001	mg/L	0.0014	1	0.003	<0.001	0.001	0.001	<0.001	<0.001	<0.001
Iron (Fe)	0.05	mg/L	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	0.001	mg/L	0.0034	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (Mn)	0.001	mg/L	1.9	-	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001
Mercury (Hg) - inorganic	0.0001	mg/L	0.0006	0.002	<0.0001	<0.0001	<0.0001	-	-	-	-
Molybdenum (Mo)	0.001	mg/L	-	0.15	0.980	0.473	0.466	0.371	0.345	0.178	0.119
Nickel (Ni)	0.001	mg/L	0.011	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.01	mg/L	0.011	0.02	0.02	0.04	0.03	0.02	0.02	0.01	<0.01
Silver (Ag)	0.001	mg/L	0.00005	-	<0.001	<0.001	<0.001	-	-	-	-
Thallium (Tl)	0.001	mg/L	-	-	<0.001	<0.001	<0.001	-	-	-	-
Thorium (Th)	0.001	mg/L	-	-	<0.001	<0.001	<0.001	-	-	-	-
Tin (Sn - inorganic)	0.001	mg/L	-	-	<0.001	<0.001	<0.001	-	-	-	-
Titanium (Ti)	0.01	mg/L	-	-	<0.01	<0.01	<0.01	-	-	-	-
Uranium (U)	0.001	mg/L	-	0.2	<0.001	<0.001	<0.001	-	-	-	-
Vanadium (V)	0.01	mg/L	-	-	5.01	1.18	0.80	0.62	0.56	0.41	0.38
Zinc (Zn)	0.005	ma/L	0.008	20	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:

* 0.024 mg/L for trivalent As (III)

** calculated based on conversion factor.

1. ANZECC & ARMCANZ (2000). Trigger values for aquatic ecosystems (95% species protection)

1 mg/L of Nitrate as N = 4.43 mg/L of Nitrate

2. ANZECC & ARMCANZ (2000). Recommended guideline limits for Livestock Drinking Water.

1 mg/L of Nitrite as N = 3.29 mg/L of Nitrite

[#] for still water bodies only, moving rivers at low flow rates should not exceed 2200µS/cm[^] calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water.

Project China Stone

Sample ID Leach event Week Leaching fluid Leaching date Total solid mass at start (g) Leachate added = DI water (mL) Leachate recovered (mL) Laboratory batch (ALS Reference No.)					Coal Ash-2 (duplicate) (KLC10)						
					L1	L2	L3	L4	L5	L6	L7
					0	4	9	13	17	22	26
					DI Water	DI Water	DI Water	DI Water	DI Water	DI Water	DI Water
					04/11/13	04/12/13	04/01/14	04/02/14	04/03/14	05/04/14	05/05/14
					749	749	749	749	749	749	749
					1,500	1,400	1,400	1,400	1,400	1,400	1,400
					706	649	610	639	686	804	749
					EB1326893	EB1330008	EB1400138	EB1402472	EB1405142	EB1408267	EB1410823
Analyte	LOR	Units	Aquatic Ecosystems ¹	Livestock Drinking ²							
Physico-Chemical											
pH (DI water)	0.01	ph unit	-	-	6.64	5.63	6.55	6.50	6.22	6.16	6.07
Electrical Conductivity (DI water)	1	µs/cm	-	-	9.75	2.98	7.12	4.79	5.96	11.83	5.84
pH (leachate)	0.01	ph unit	6 to 9	-	11.05	8.48	7.34	7.24	7.59	7.22	7.03
Electrical Conductivity (leachate)	1	µs/cm	<1,000 [#]	3,580 [^]	2,780	1,467	1,629	926	732	619	461
Alkalinity and Acidity											
Bicarbonate Alkalinity as CaCO ₃	1	mg/L	-	-	<1	22	33	27	28	28	31
Carbonate Alkalinity as CaCO ₃	1	mg/L	-	-	62	2	<1	<1	<1	<1	<1
Hydroxide Alkalinity as CaCO ₃	1	mg/L	-	-	182	<1	<1	<1	<1	<1	<1
Total Alkalinity as CaCO ₃	1	mg/L	-	-	244	24	33	27	28	28	31
Acidity as CaCO ₃	1	mg/L	-	-	<1	3	2	3	8	3	5
Net Alkalinity as CaCO ₃	1	mg/L	-	-	244	21	31	24	20	25	26
Major Ions											
Calcium (Ca) +	1	mg/L	-	1000	573	319	374	160	121	102	68
Magnesium (Mg) +	1	mg/L	-	-	<1	20	39	24	18	16	11
Potassium (K) +	1	mg/L	-	-	7	1	2	1	<1	<1	<1
Sodium (Na) +	1	mg/L	-	-	15	3	4	3	2	2	1
Sulfate (SO ₄) - turbidimetric	1	mg/L	-	1000	947	751	859	400	281	244	168
Chloride (Cl) -	1	mg/L	-	-	21	56	64	42	26	24	10
Fluoride (F) -	0.1	mg/L	-	2	0.5	2.3	3.1	2.1	2.0	1.6	1.7
Nutrients											
Ammonia as N	0.01	mg/L	0.9	-	0.12	0.02	0.01	0.02	<0.01	<0.01	0.02
Nitrate (NO ₃)	-	mg/L	0.7	400	-	-	-	-	-	-	-
Nitrite (NO ₂)	-	mg/L	-	30	-	-	-	-	-	-	-
Nitrate + Nitrite as N (NOX) **	0.01	mg/L	0.16	99.4	0.04	0.04	<0.01	0.06	0.08	0.08	0.12
Total Kjeldahl Nitrogen (TKN)	0.1	mg/L	-	-	0.40	<0.1	0.30	0.20	<0.1	<0.1	<0.1
Total Nitrogen as N (TKN + NOX)	0.1	mg/L	-	-	0.44	<0.1	0.30	0.26	<0.1	<0.1	0.12
Total Cyanide (CN)	0.004	mg/L	0.007	-	<0.004	<0.004	<0.004	-	-	-	-
Total Phosphorus as P	0.01	mg/L	-	-	<0.01	0.01	0.01	0.03	<0.01	0.01	0.02
Metals and Metalloids											
Aluminium (Al)	0.01	mg/L	0.055	5	0.48	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Antimony (Sb)	0.001	mg/L	-	-	0.006	0.004	0.006	0.002	0.002	0.003	0.002
Arsenic (As) - pentavalent	0.001	mg/L	0.013*	0.5	0.002	0.006	0.005	0.004	0.003	0.003	0.002
Barium (Ba)	0.001	mg/L	-	-	0.230	0.046	0.039	0.027	0.017	0.017	0.01
Beryllium (Be)	0.001	mg/L	-	-	<0.001	<0.001	<0.001	-	-	-	-
Boron (B)	0.05	mg/L	0.37	5	2.88	0.86	1.21	0.91	0.93	0.94	0.52
Cadmium (Cd)	0.0001	mg/L	0.0002	0.01	0.0008	0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001
Chromium (Cr - total)	0.001	mg/L	-	1	1.18	0.259	0.191	0.127	0.092	0.066	0.033
Chromium VI (Cr - hexavalent)	0.01	mg/L	0.001	-	0.97	0.32	0.22	0.16	0.11	0.08	0.03
Cobalt (Co)	0.001	mg/L	-	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	0.001	mg/L	0.0014	1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	0.05	mg/L	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead (Pb)	0.001	mg/L	0.0034	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (Mn)	0.001	mg/L	1.9	-	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Mercury (Hg) - inorganic	0.0001	mg/L	0.0006	0.002	<0.0001	<0.0001	<0.0001	-	-	-	-
Molybdenum (Mo)	0.001	mg/L	-	0.15	2.340	0.452	0.494	0.406	0.338	0.214	0.151
Nickel (Ni)	0.001	mg/L	0.011	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.01	mg/L	0.011	0.02	0.02	0.03	0.03	0.02	0.01	0.01	<0.01
Silver (Ag)	0.001	mg/L	0.00005	-	<0.001	<0.001	<0.001	-	-	-	-
Thallium (Tl)	0.001	mg/L	-	-	<0.001	<0.001	<0.001	-	-	-	-
Thorium (Th)	0.001	mg/L	-	-	<0.001	<0.001	<0.001	-	-	-	-
Tin (Sn - inorganic)	0.001	mg/L	-	-	<0.001	<0.001	<0.001	-	-	-	-
Titanium (Ti)	0.01	mg/L	-	-	<0.01	<0.01	<0.01	-	-	-	-
Uranium (U)	0.001	mg/L	-	0.2	<0.001	<0.001	0.001	-	-	-	-
Vanadium (V)	0.01	mg/L	-	-	1.88	1.26	0.80	0.56	0.60	0.45	0.44
Zinc (Zn)	0.005	mg/L	0.008	20	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:

* 0.024 mg/L for trivalent As

1. ANZECC & ARMCANZ (2000). Trigger values for aquatic ecosystems (95% species protection)

2. ANZECC & ARMCANZ (2000). Recommended guideline limits for Livestock Drinking Water

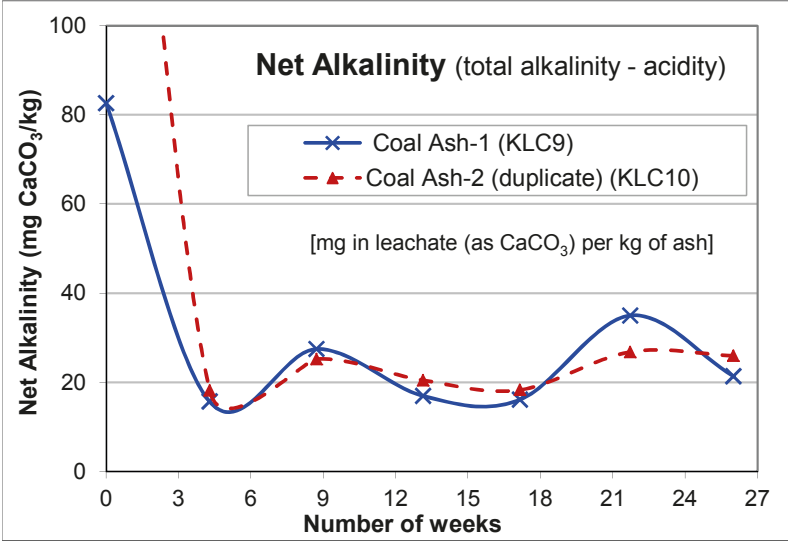
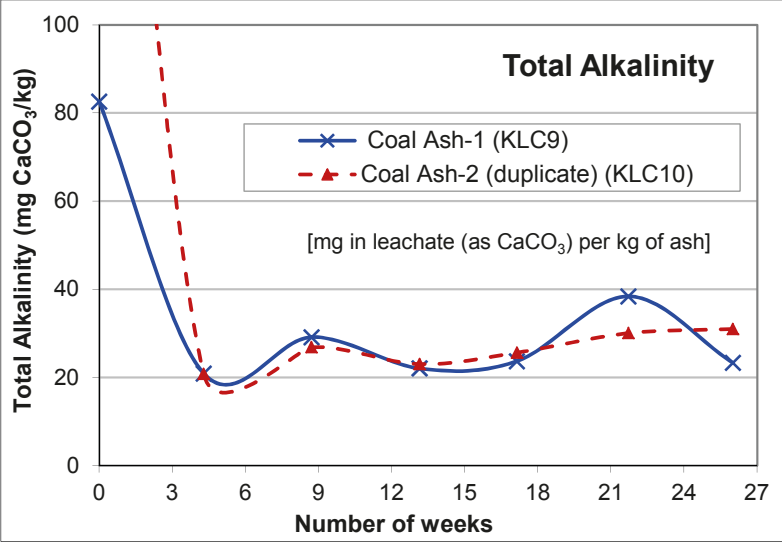
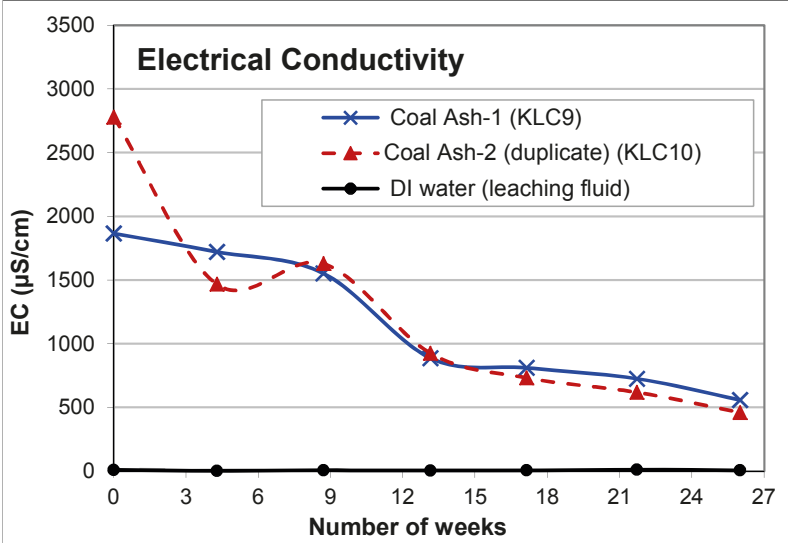
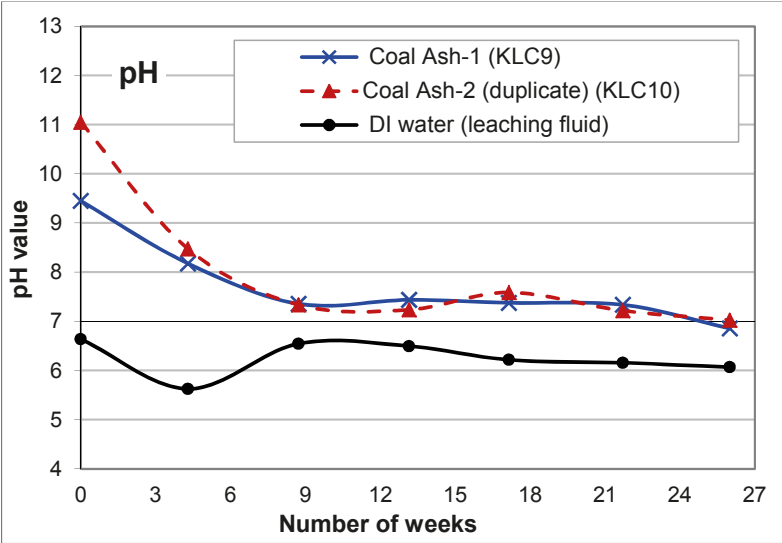
[#] for still water bodies only, moving rivers at low flow rates should not exceed 2200µS/cm

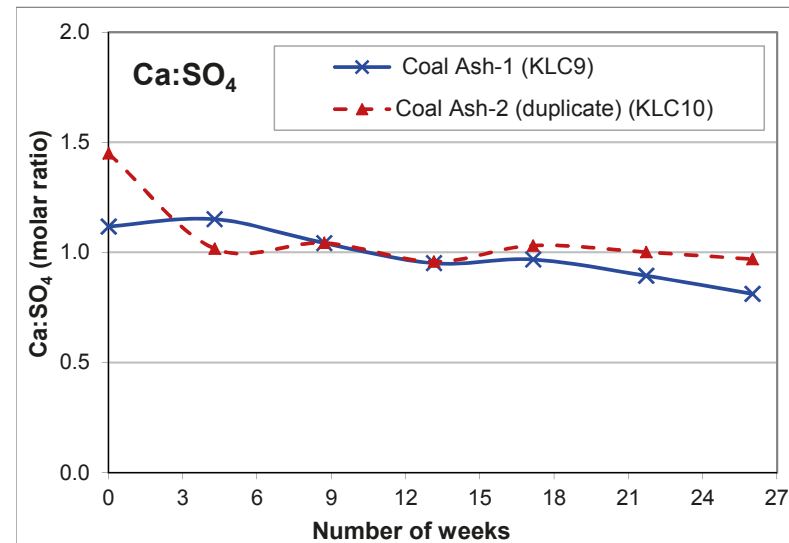
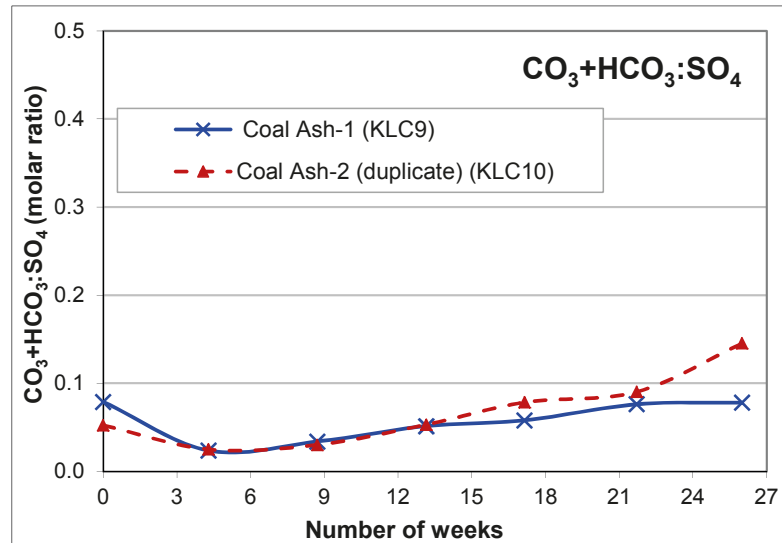
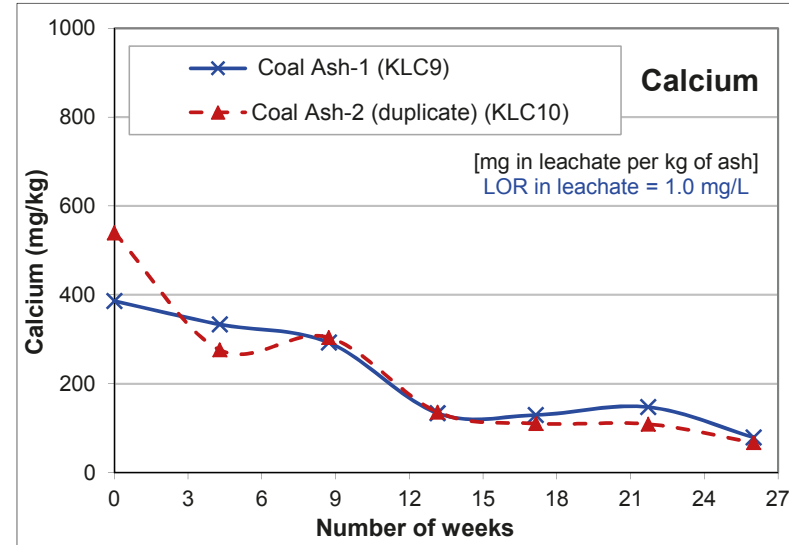
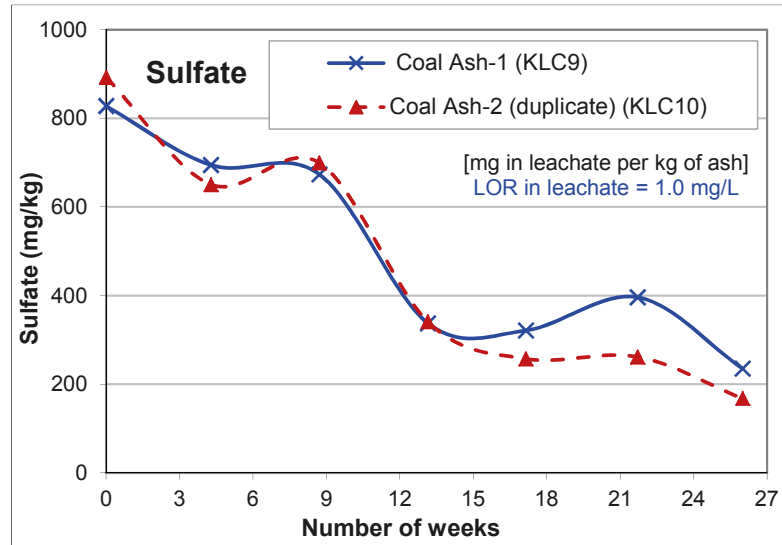
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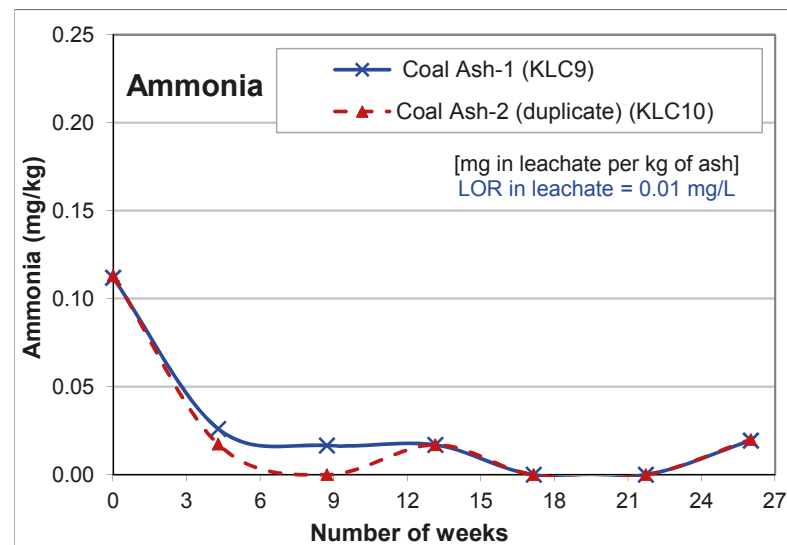
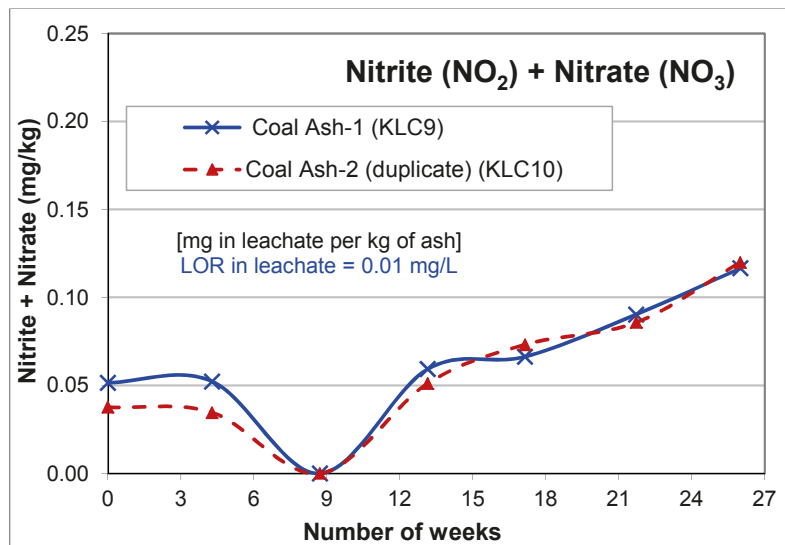
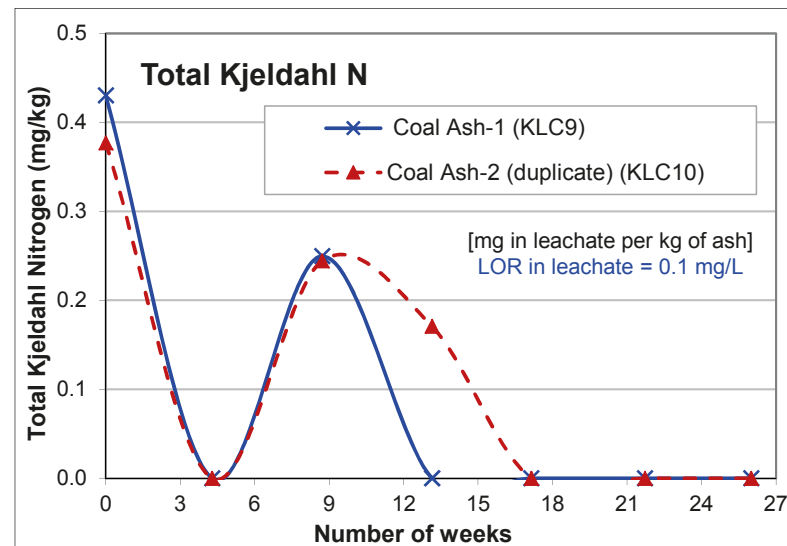
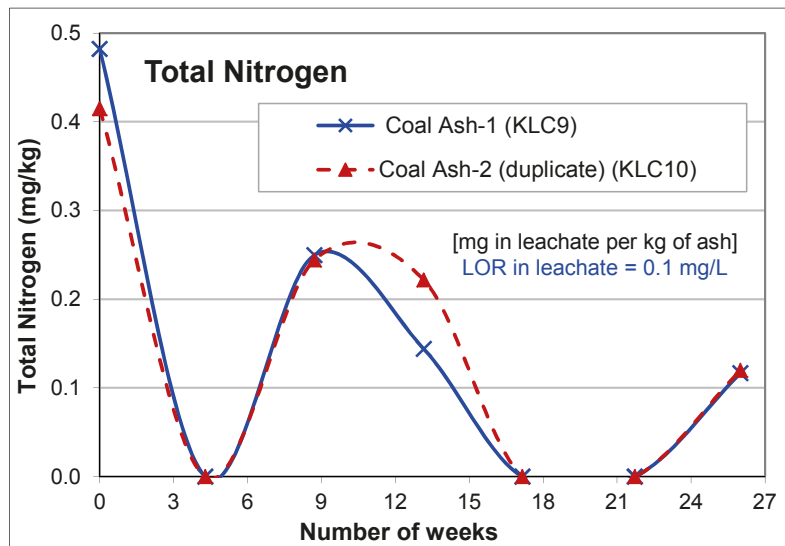
1 mg/L of Nitrate as N = 4.43 mg/L of Nitrate

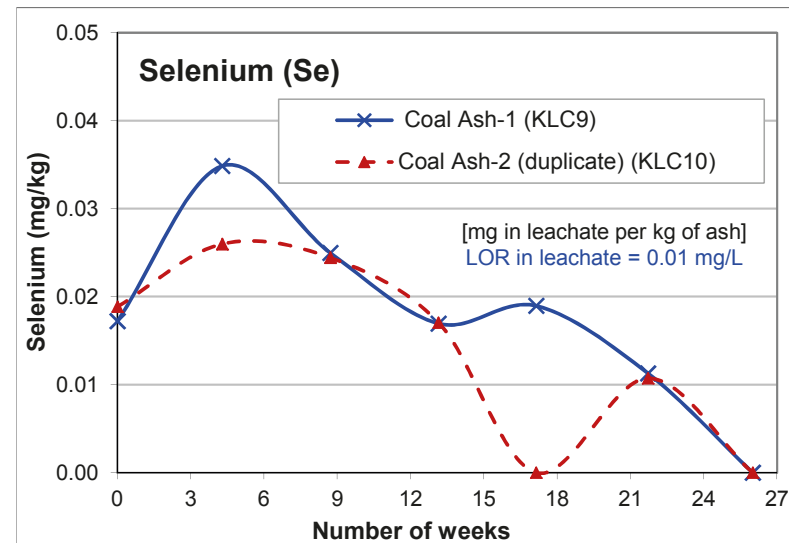
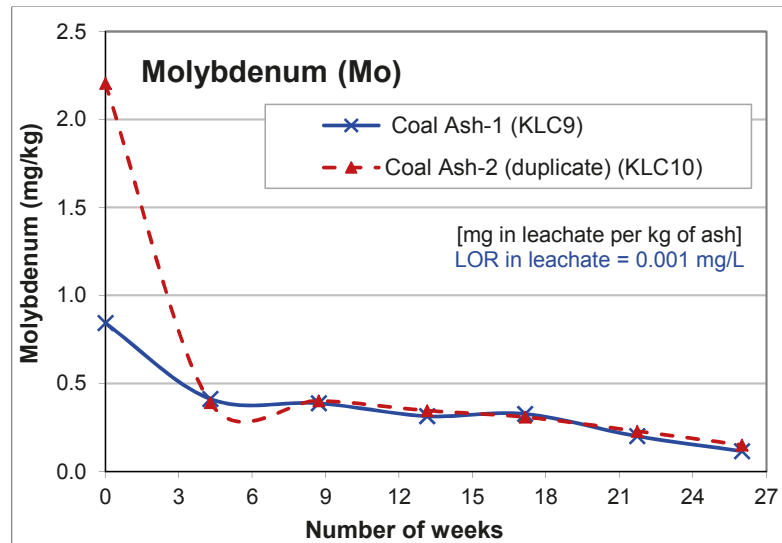
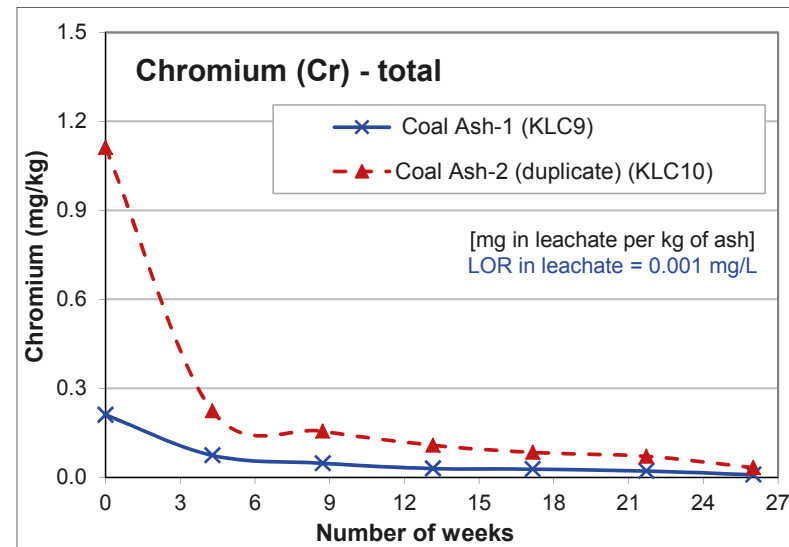
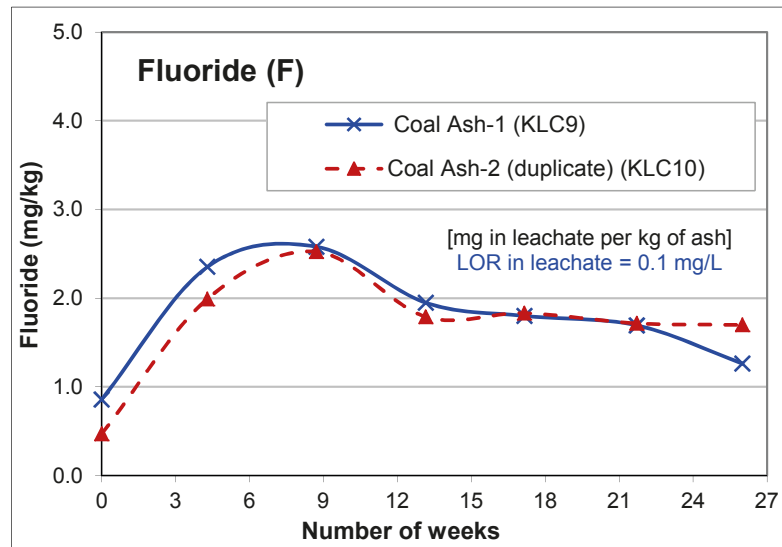
1 mg/L of Nitrite as N = 3.29 mg/L of Nitrite

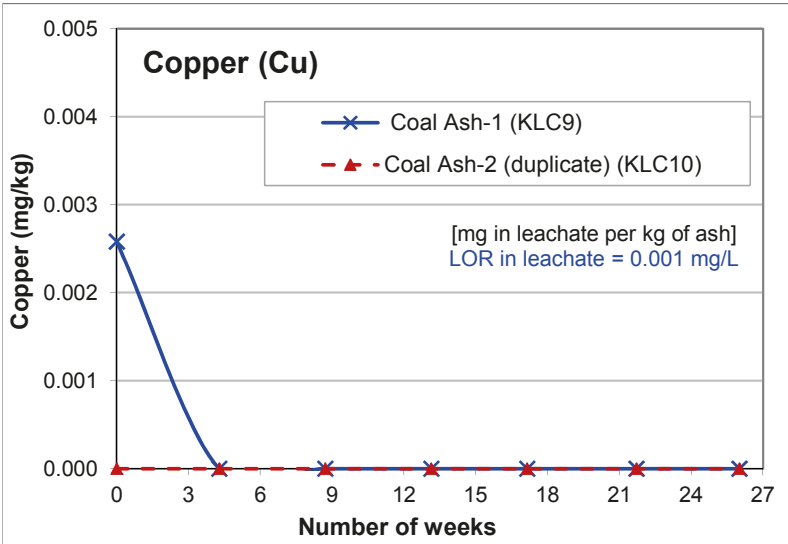
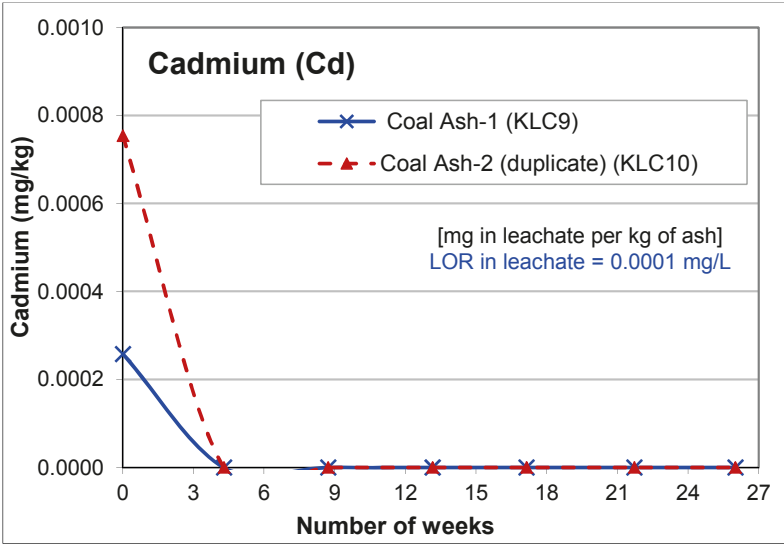
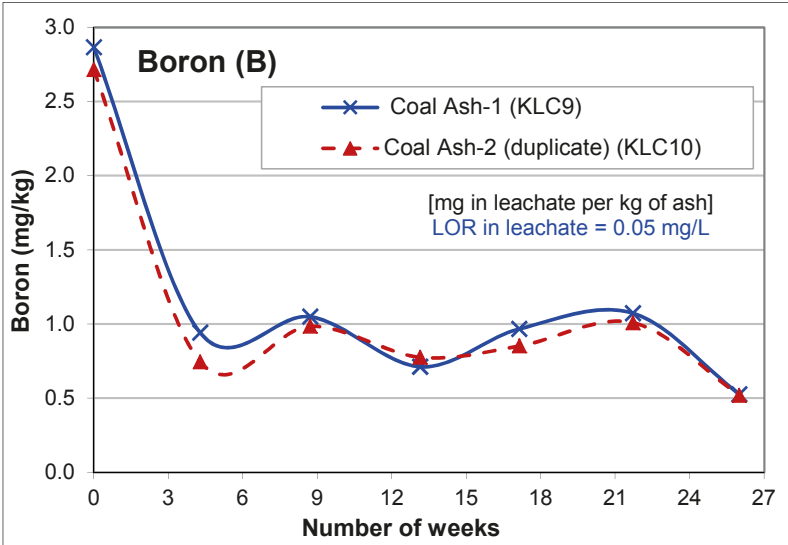
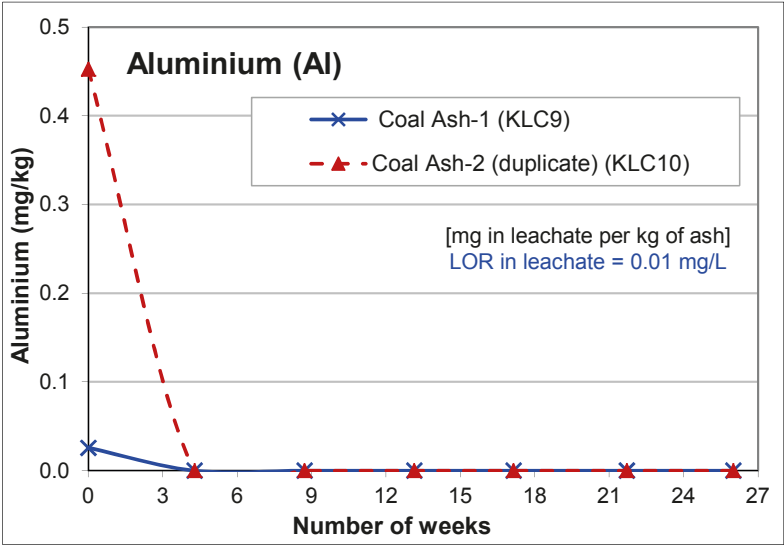
[^] calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water.













**LEADERS IN MINING
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