

EA APPLICATION SUPPORTING REPORT

SAVANNAH GOLDFIELDS LTD

Appendix 9 Waste Rock Characterisation (C&R Consulting, 2022)



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AGATE CREEK GOLD MINE



Waste Rock Characterisation

Report Prepared for:



Date:
August 2022

CLIENT: WULGURU TECHNICAL SERVICES
PROJECT: AGATE CREEK GOLD MINE
REPORT: WASTE ROCK CHARACTERISATION
DATE: AUGUST 2022



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SUMMARY OF RELEVANT INFORMATION

Project Title	Agate Creek Gold Mine – Waste Rock Characterisation
Property Location	Agate Creek Gold Mine
Property Description	Open-cut gold mine
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EXECUTIVE SUMMARY

C&R Consulting Pty Ltd (C&R) were commissioned by Wulguru Technical Services (WTS) to undertake a geochemical waste rock characterisation (WRC) study of the Agate Creek Gold Mine (Agate Creek). This study will form part of the major environmental authority (EA) amendment and progressive rehabilitation and closure plan that WTS are currently preparing on behalf of Agate Creek's current owners, Laneway Resources.

In accordance with the Queensland Department of Environment and Science (DES, 2021) *Guideline – Progressive rehabilitation and closure plans (PRC plans)*, this WRC study has been undertaken to:

“Characterise mine wastes in a report that describes the likely physical behaviour and chemical reactivity of the waste materials under the conditions in which they would be stored. The report must address the constituent elements present, and their likely future speciation and mobility.”

To achieve this, 260 rock samples were collected from 27 drill holes across the six proposed open-cut pits. These samples were tested in a National Association of Testing Authorities accredited laboratory for a range of static and kinetic geochemical properties, including acid generation, salinity, major ions and metal/metalloid concentrations.

The undertaken geochemical testing identified that all of the waste rock samples have similar physical and geochemical characteristics. This is to be expected given that most waste rock areas are constructed of the same lithology (volcaniclastic sediment).

The static geochemical results indicate that all waste rock areas:

- Are overwhelmingly non-acid forming, with 90% of the waste rock considered NAF with the potential to buffer any acid that is produced;
- Display low salinity values (mean of 43.5 $\mu\text{S}/\text{cm}$);
- Have some degree of fluoride enrichment; and
- Are not particularly enriched with respect to any of the other elements analysed.

The kinetic geochemical results compared well with the static results, indicating a level chemical stability.

Overall, the waste rock associated with the project is relatively benign and considered of very low to low risk of environmental harm.

1. INTRODUCTION

1.1 BACKGROUND INFORMATION

C&R Consulting Pty Ltd (C&R) have been asked to undertake a geochemical waste rock characterisation (WRC) study of the Agate Creek Gold Mine (Agate Creek) stage 2 expansion, on behalf of Wulguru Technical Services (WTS). This study will form part of a major environmental authority (EA) amendment and progressive rehabilitation and closure plan (PRCP) that WTS are currently preparing on behalf of Agate Creek's current owners, Laneway Resources (Laneway).

Agate Creek is located in north Queensland, approximately 340 km (520 km by road) west of Townsville and 45 km (70 km by road) south of the township of Forsyth (Figure 1). Alluvial gold was reported at Agate Creek in the early 20th century, and was followed by various prospecting activities – including panning, shallow digs and regional exploration.

In February 2015, Laneway lodged a mining lease application for the Agate Creek prospect following a successful 5,000 tonne bulk trial pit. Mining lease (ML) 100030 was granted to Laneway on 7 February 2019, allowing Laneway to mine up to 250,000 tonnes of ore at Agate Creek under EA EPSL03068015 (dated 6 September 2021).

Laneway intends to progress Agate Creek into the stage 2 expansion phase, requiring approval to mine up to 250,000 tonnes of ore and a major EA amendment. In accordance with the Queensland Department of Environment and Science (DES, 2021) *Guideline – Progressive rehabilitation and closure plans (PRC plans)*, a WRC assessment should be undertaken to accompany the major EA amendment submission.

1.2 SCOPE OF WORK

The PRCP guideline (DES, 2021) outlines the WRC reporting requirement:

“Characterise mine wastes in a report that describes the likely physical behaviour and chemical reactivity of the waste materials under the conditions in which they would be stored. The report must address the constituent elements present, and their likely future speciation and mobility.”

In order to characterise the mine wastes as per the PRCP guideline, this investigation employed the following scope of works:

- Review existing geological and geochemical data;
- Design a sampling programme to be undertaken as part of the Agate Creek open-cut exploration, reverse-circulation (RC) drilling programme;
- Collate, validate and statistically analyse geochemical test results from a National Association of Testing Authorities (NATA) accredited laboratory;
- Compile a WRC dataset to consider waste rock drainage characteristics and the potential environmental risks these may pose; and
- Conduct a WRC study to provide supporting evidence for the rehabilitation requirements to support the submission of the Agate Creek major EA amendment.

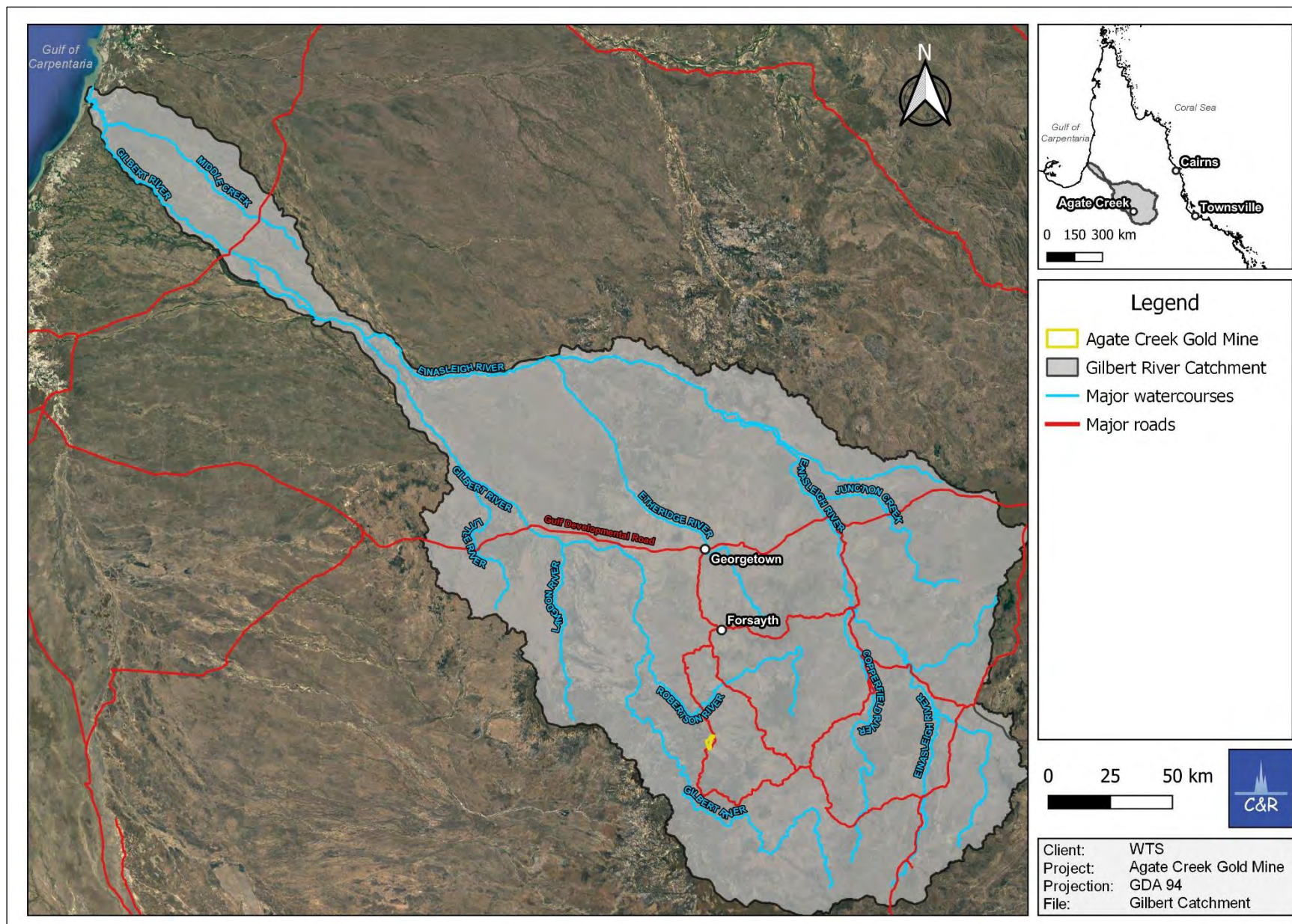


Figure 1: Project site location.

2. SITE DESCRIPTION

Agate Creek is an open-cut gold mining operation located within the Etheridge Shire in north Queensland, within the Gilbert River Basin that flows into the Gulf of Carpentaria (Figure 1). Trial mining commenced at Agate Creek in 2013, with a transition to full-scale production occurring in 2019. All mining activities undertaken at Agate Creek are permitted under the current EA EPSL03068015 (dated 6 September 2021).

2.1 CLIMATE

Agate Creek is located within the seasonally arid tropics, with the area dominated by intense rainfall events throughout the summer months. These rainfall events are often highly variable in their spatial and temporal distribution, with the majority of the rain falling in distinct, spatially separated cells across the landscape. Rainfall throughout the remainder of the year is generally limited to an occasional shower in June or July and evaporation tends to exceed rainfall for almost all days of the year, with the exception of periods with intense rainfall events. The Agate Creek operations are exposed to this seasonal rainfall, whereby it is expected that more than 90% of the rainfall will eventuate as either surface runoff or waste dump seepage.

2.2 GEOLOGY

The Agate Creek deposit is located in the central portion of the Proterozoic Etheridge Province. These Proterozoic Etheridge metamorphic rocks were extensively intruded by Silurian to Early Devonian granitoid batholiths, and dominantly felsic Carboniferous to Early Permian magmatic complexes (Morrison *et al.*, 2019). The mineralisation at Agate Creek is related to the emplacement of Permo-Carboniferous porphyritic rhyolite and andesite extrusives and intrusives, commonly referred to as the Agate Creek Volcanic Group.

Gold mineralisation at Agate Creek is hosted by a low sulphidation, epithermal system consisting of quartz-chalcedony veining, stockwork and breccia. Host rock lithology is predominantly porphyritic rhyolite or andesite that occupy shallow, south-east dipping thrust faults in Silurian granodiorite (Morrison *et al.*, 2019). This host rock is principally volcanic in origin. Therefore, for the purpose of this WRC study, the waste rock is inferred to be entirely composed of the same unit: felsic volcanics with silicified veins and/or breccia.

A series of complex hydrothermal alteration assemblages surround the Agate Creek ore body. These assemblages range from a distal, ubiquitous propylitic zone (chlorite +/- carbonate-epidote-pyrite-haematite) grading inwards to a more proximal, variably argillic to sericitic zone (clay +/- quartz-sericite-pyrite) and locally phyllic zone (silica +/- pyrite or iron oxide) (Morrison *et al.*, 2019). Most of the hydrothermal alteration in the Agate Creek expansion area is predominantly clay +/- silica, sericite and/or pyrite (now weathered to iron oxide). Therefore, alteration was not considered a significant factor in this WRC study.

2.3 PROPOSED OPEN-CUT PITS

2.3.1 STAGE 2 EXPANSION

The stage 2 expansion of the Agate Creek mine involves mining six different open-cut pits (Figure 2). The mine is currently working Pit 6 under the current EA that allows up to 200,000 tonnes of material to be extracted. However, further approval is required to mine Pit 6 deeper – exceeding the 200,000 tonnes limit – as well mining an additional five satellite pits. This proposed Agate Creek stage 2 expansion comprises 3,774,081 tonnes of waste rock material.

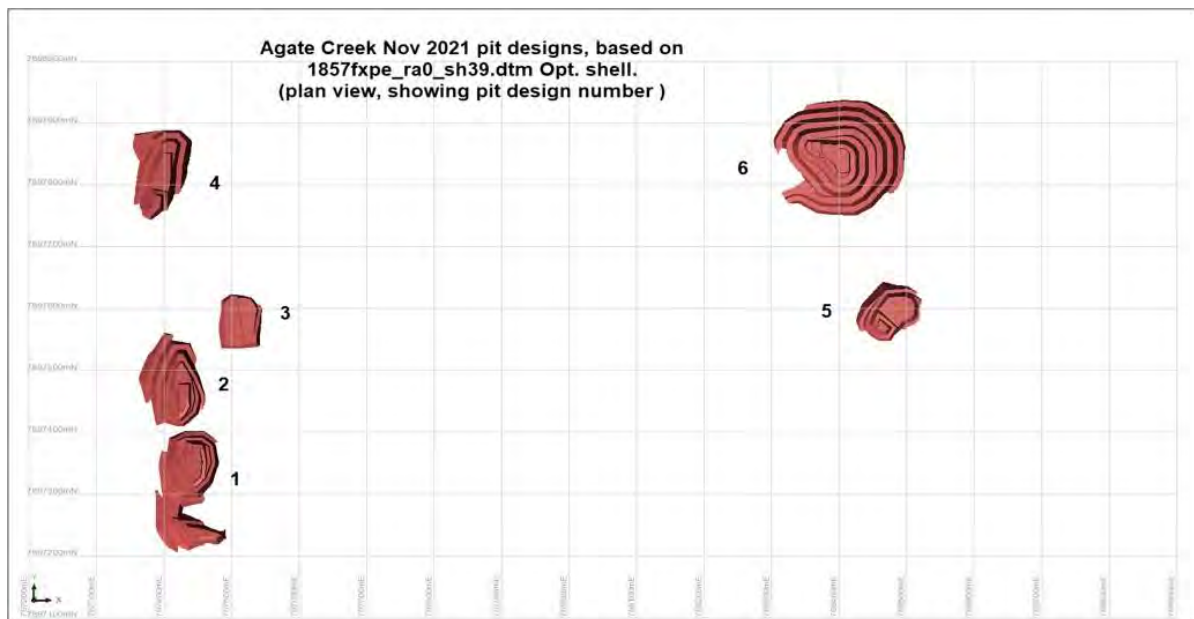


Figure 2: Pit designs for the proposed Agate Creek stage 2 expansion. Figure sourced from WTS.

2.4 WASTE CHARACTERISATION SAMPLING STRATEGY

The waste rock sampling programme for the six proposed open-cut pits was guided by the Australian technical guidelines for the geochemical assessment of mining wastes (Department of Mines and Energy [DME], 1995; Department of Environment and Heritage Protection [DEHP], 2013; Commonwealth of Australia [COA], 2016). The DME (1995) guideline recommends that the tonnage of mined material determine the sampling interval, whereas the more recent guidelines favour a risk-based approach.

The waste characterisation sampling strategy for the Agate Creek stage 2 expansion open-cut pits incorporated the collection of samples from regular intervals (every 3 m) in selected RC drill holes. These selected drillholes were chosen to represent a cross-section of the rock profile in each proposed open-cut pit (Figure 3 to Figure 8).

Figure 9 demonstrates that sampling was undertaken at regular intervals in the selected RC drill holes. The interval spacing was selected to cover all areas anticipated to have acid rock drainage (ARD) potential – including around the ore bodies, alteration zones, transitional material and fresh rock. This sampling methodology was adopted with the aim to provide a good statistical and spatial representation of the waste rock profile in each pit.

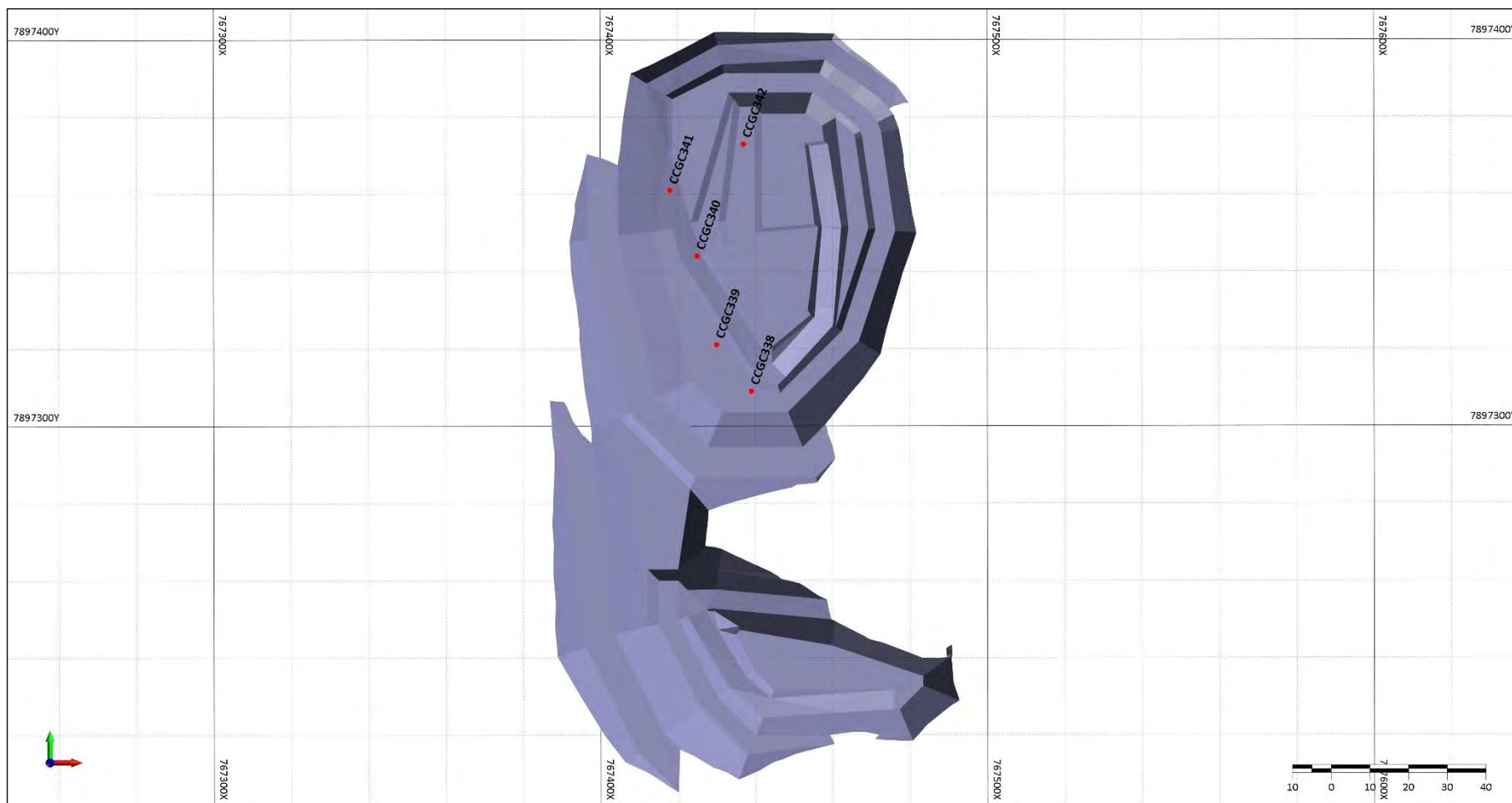


Figure 3: Location of exploration drill holes sampled in Pit 1.

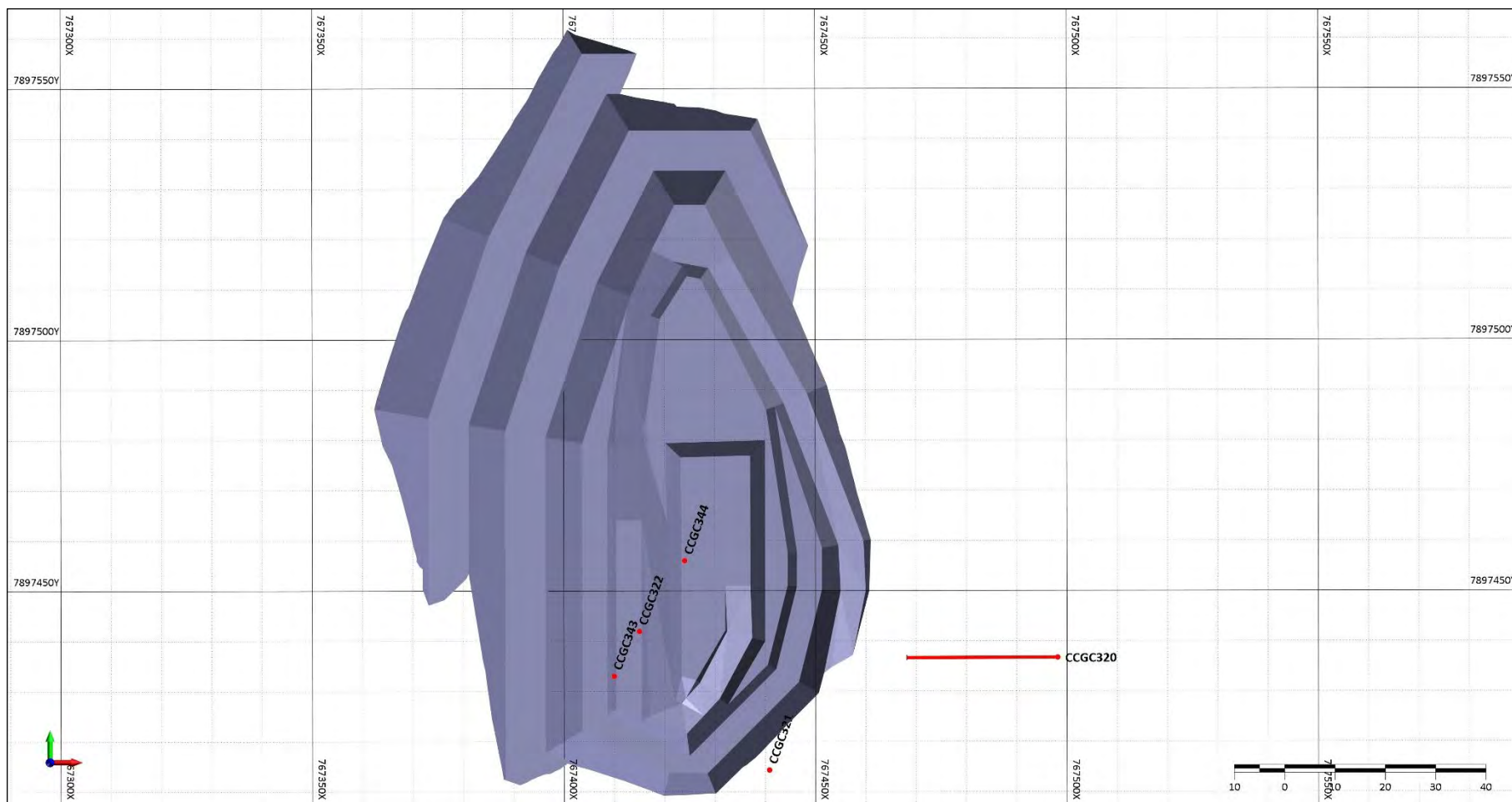


Figure 4: Location of exploration drill holes sampled in Pit 2.

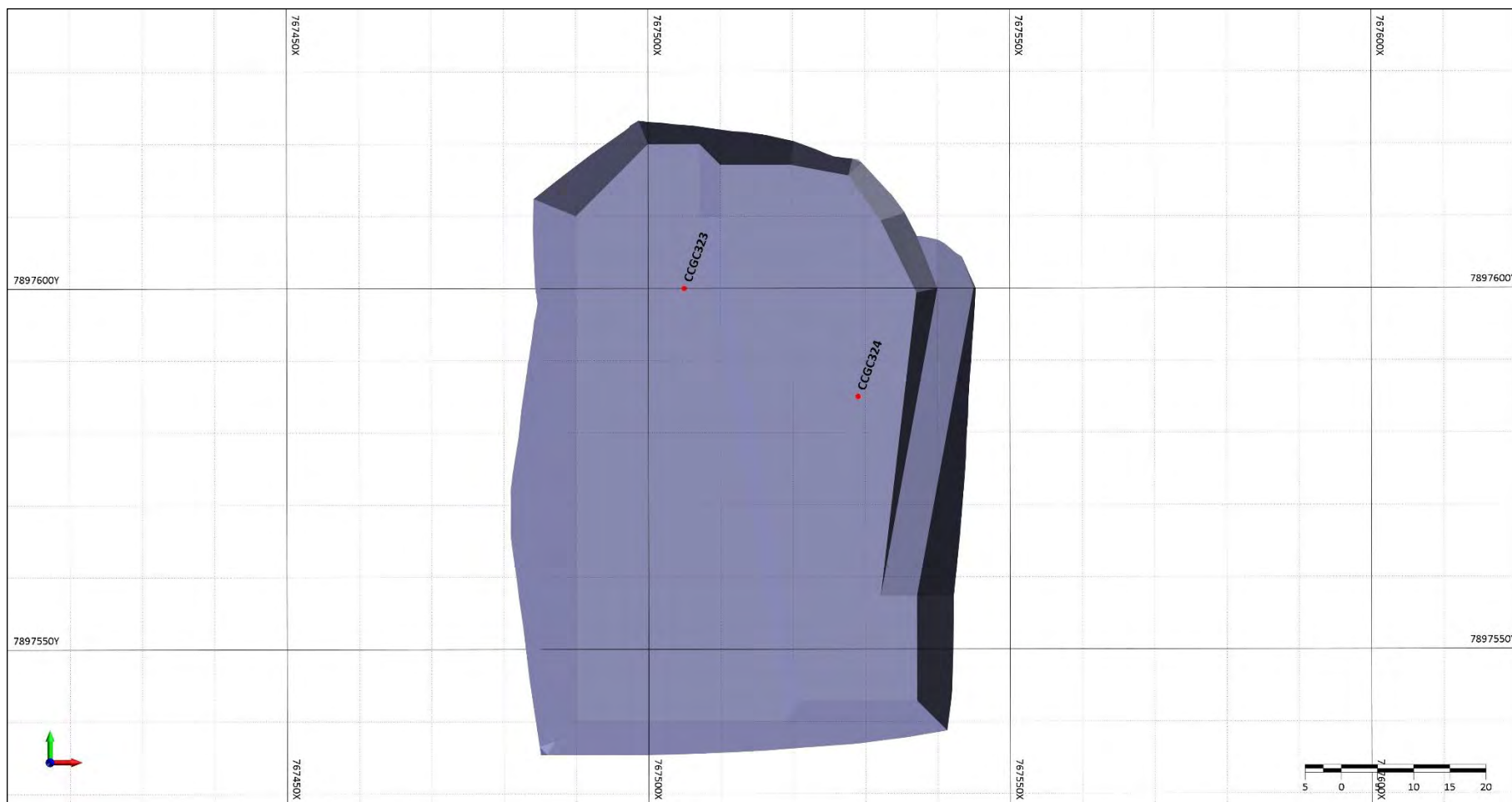


Figure 5: Location of exploration drill holes sampled in Pit 3.

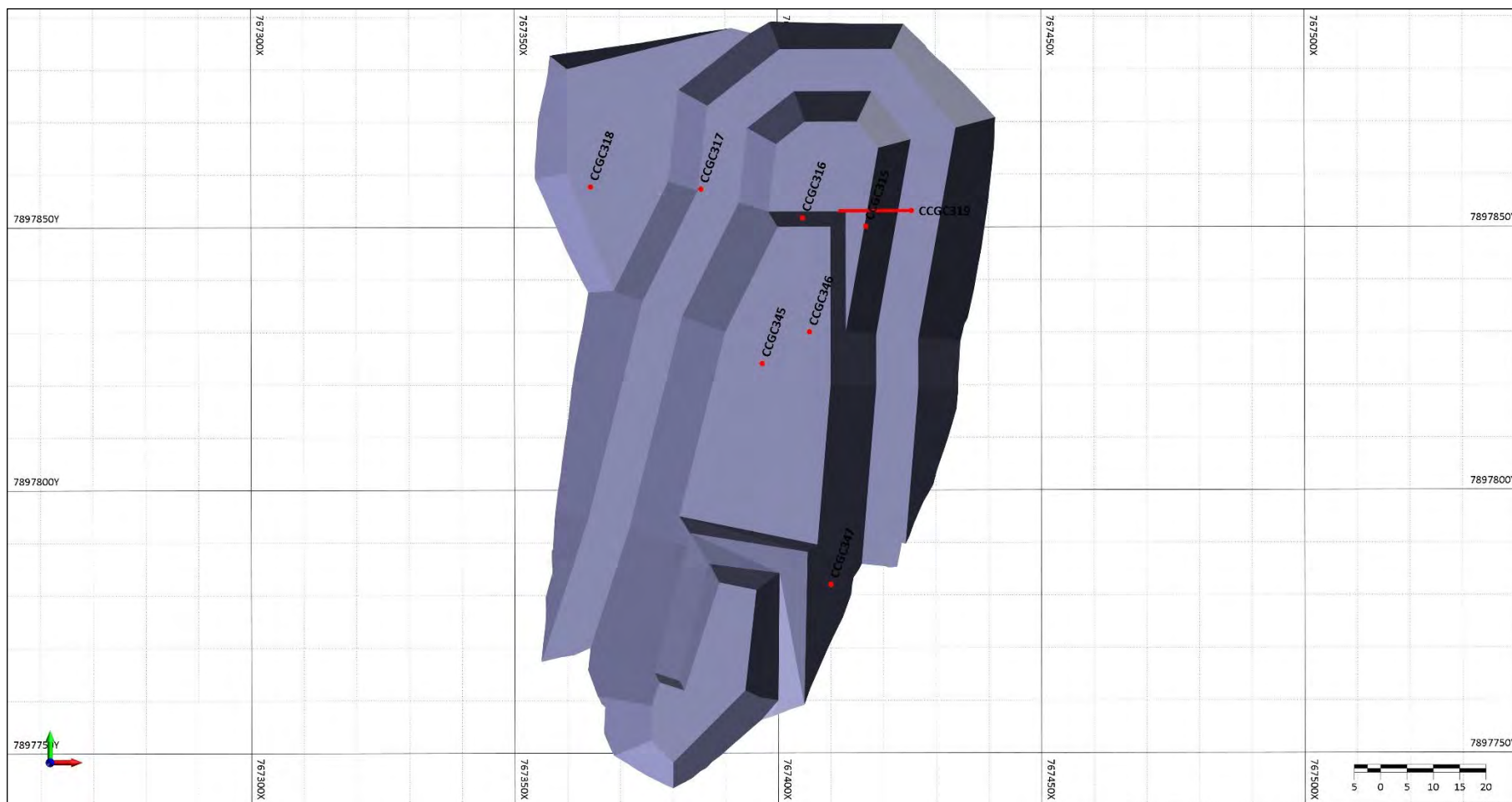


Figure 6: Location of exploration drill holes sampled in Pit 4.

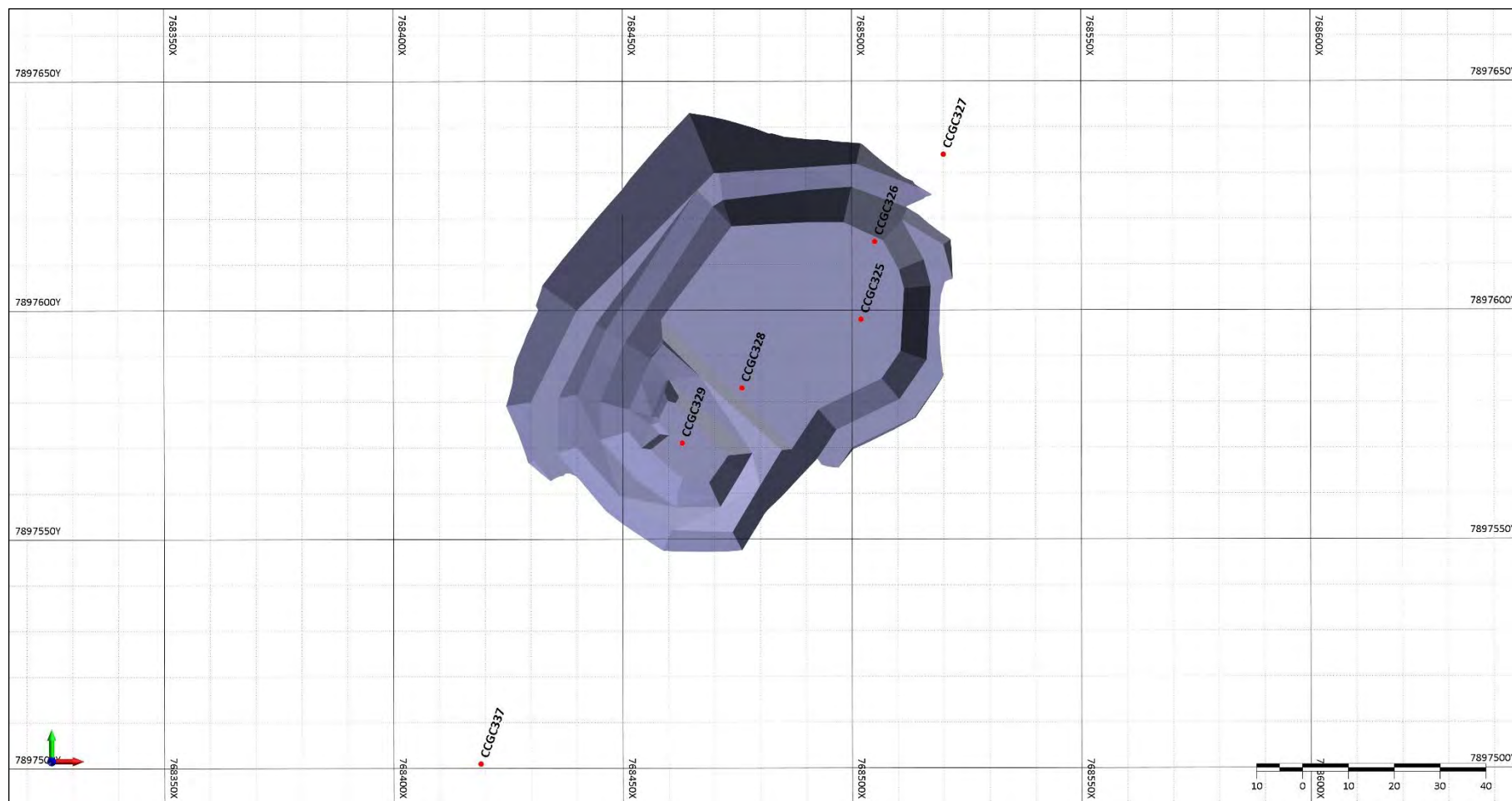


Figure 7: Location of exploration drill holes sampled in Pit 5.

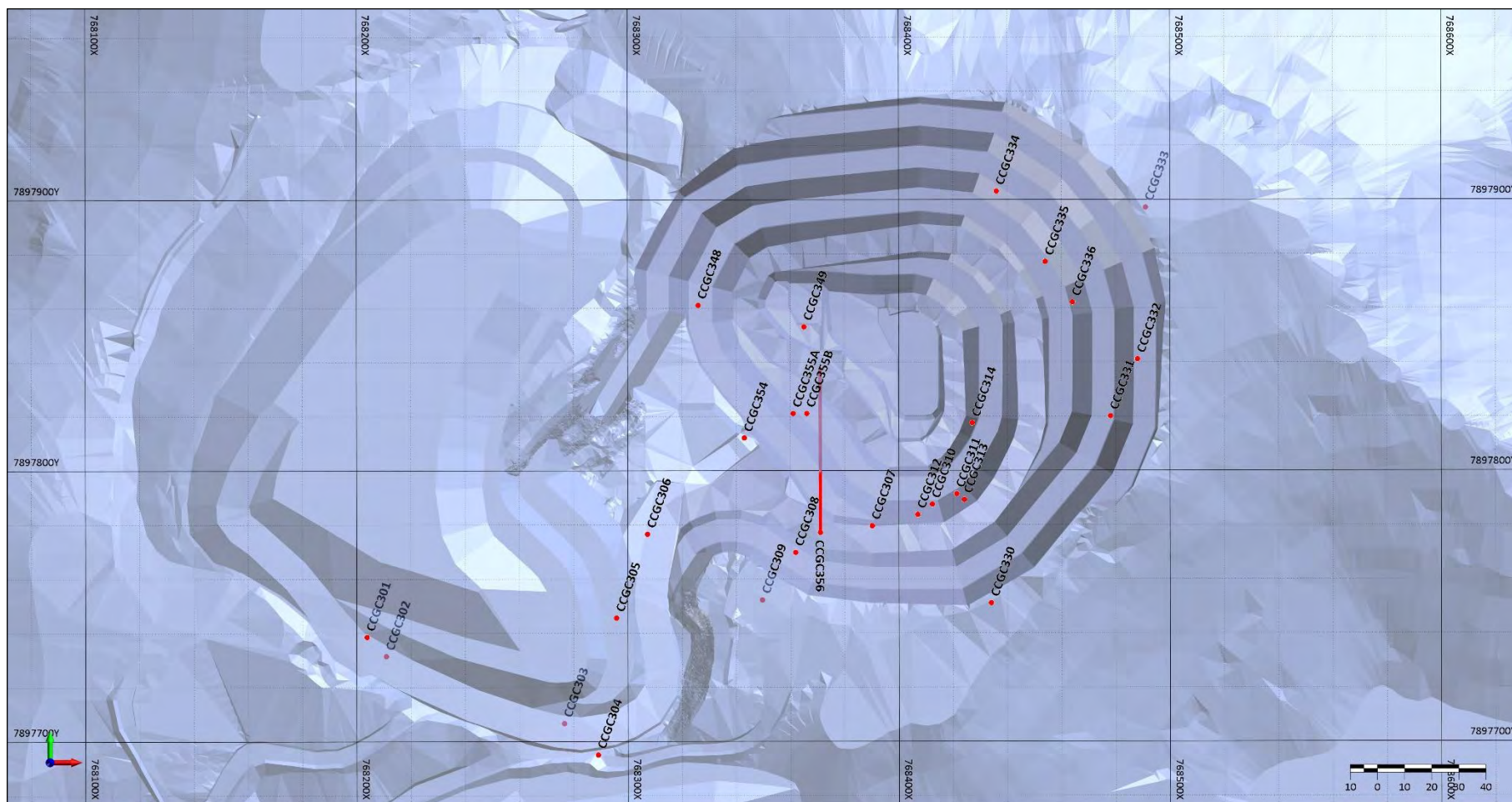


Figure 8: Location of exploration drill holes sampled in Pit 6.

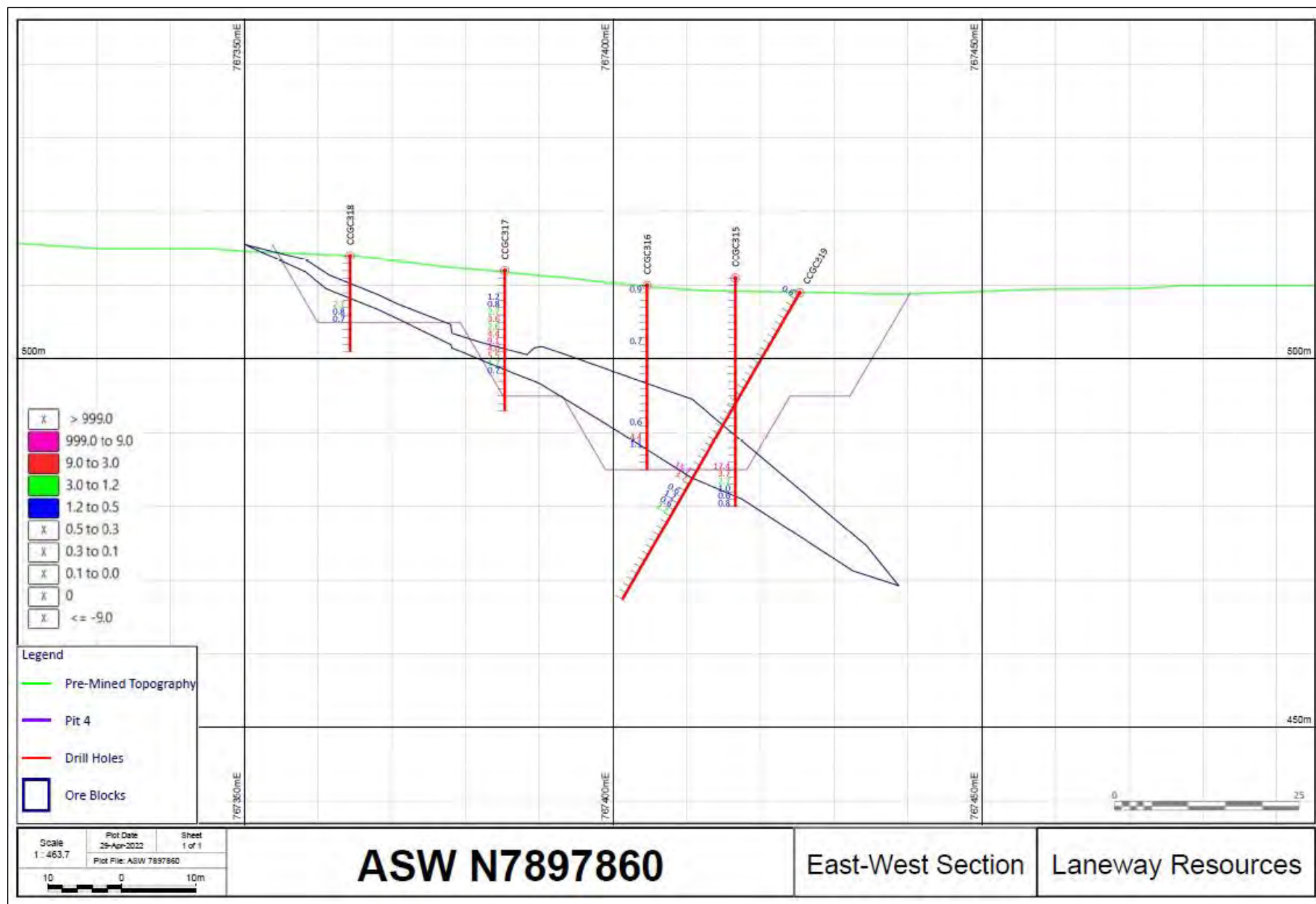


Figure 9: Sample selection example.

3. METHODS

3.1 SAMPLING PROGRAMME

A total of 260 rock samples were collected from 27 drill holes across the six proposed pits. The samples represent the rock type (felsic volcanics) and provide a reasonable distribution of alteration zones and weathering types (oxide, transitional and fresh). The 260 rock samples were taken at regular intervals (generally every 3 m) from select exploration holes (Table 1). Discussions with on-site geologists revealed that it was difficult to accurately determine where the targeted ore occurred within each exploration hole due to the varying ore grades – encountered throughout each hole – that have the potential to be utilised in the future. Therefore, all analysed samples were included in the assessment/investigation to provide a worst-case scenario (because it contains the highly mineralised ore body) characterisation of potential waste rock (Table 1).

Each sample consists of RC chip material collected by Laneway geological personnel at the exploration drilling rig, utilising a cyclone splitter attachment. Laneway provided bulk sample bags for each metre of each exploration hole to a NATA-accredited laboratory. The NATA-accredited laboratory then split the required samples for geochemical analysis. The minimum amount of sample collected (during the split) was 250 g for static tests, with more than 25 kg gathered for kinetic test work.

Table 1: Summary of samples taken across the proposed pits.

Proposed pit	Waste tonnes	Number of holes	Hole ID	Number of samples	Number of samples/pit
Pit 1	750,195	4	CCGC338	7	22
			CCGC339	1	
			CCGC340	7	
			CCGC341	7	
Pit 2	348,570	3	CCGC321	9	22
			CCGC343	7	
			CCGC344	6	
Pit 3	51,627	2	CCGC323	5	14
			CCGC324	9	
Pit 4	229,591	5	CCGC316	9	34
			CCGC319	11	
			CCGC345	7	
			CCGC346	1	
			CCGC347	6	
Pit 5	157,318	2	CCGC326	7	18
			CCGC329	11	
Pit 6	2,236,780	11	CCGC302	3	150
			CCGC303	9	

Proposed pit	Waste tonnes	Number of holes	Hole ID	Number of samples	Number of samples/pit
			CCGC306	11	
			CCGC308	11	
			CCGC309	1	
			CCGC311	21	
			CCGC334	6	
			CCGC336	1	
			CCGC349	14	
			CCGC354	25	
			CCGC356	48	
Total	3,774,081	27	-	260	260

3.2 GEOCHEMICAL CHARACTERISATION

The geochemical test work was based on industry-recognised procedures for the geochemical characterisation and assessment of mine waste (AMIRA, 2002; The International Network for Acid Prevention [INAP], 2014; COA, 2016).

3.2.1 STATIC TESTS

Static geochemical tests provide information on the bulk geochemical characteristics of samples at a single point in time. They do not provide information on rates of chemical processes – or the release rates due to weathering processes.

All 260 samples dispatched to the ALS laboratory underwent static geochemical testing to evaluate the risk associated with the potential oxidation of sulphides, acid generation, and the presence of metals/metalloids and salts.

Each sample underwent static geochemical testing for:

- pH;
- Electrical conductivity (EC);
- Total sulphur;
- Acid neutralising capacity (ANC);
- Net acid generation (NAG);
- Net acid production potential (NAPP);
- Major dissolved anions for Cl, F and SO₄; and
- Total metals/metalloids for Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, V and Zn.

Furthermore, four selected kinetic leach column samples (refer to Section 3.2.2) underwent additional static geochemical testing for:

- Moisture content;
- Major dissolved cations for Ca, Mg, Na and K; and
- Total metals/metalloids for Mo, Sb, Te, Th, Tl and U.

All static geochemical results are provided in Appendix A.

3.2.2 KINETIC LEACH COLUMN TESTS

Kinetic leach column (KLC) tests accelerate the weathering of samples and provide information on the magnitude and/or effects of dynamic processes that result from weathering. Unlike static tests, KLC tests measure the varying geochemical characteristics of sample effluent over a prolonged period of time.

Four samples were dispatched to a NATA-accredited laboratory for KLC tests: one from Pit 1, one from Pit 4 and two from Pit 6. These large KLC samples (>25 kg) represent a considerable proportion of the waste rock profile of each pit (Table 2).

Table 2: Summary of the KLC samples taken across the proposed pits.

Proposed Pit	Borehole	Composite samples	Interval
Pit 1	CCGC339	V34619 – V34636	0 – 21.6 metres
Pit 4	CCGC346	V34745 – V34762	0 – 21.6 metres
Pit 6	CCGC309	V32228 – V32258	0 – 31.0 metres
	CCGC336	V34048 – V34117	0 – 70.0 metres

Individual leach columns were set up for each of the four samples, with a leachate-analysis cycle undertaken on a fortnightly basis.

Each kinetic leachate column underwent kinetic geochemical testing for:

- pH;
- EC;
- Total dissolved solids (calculated);
- Hardness;
- Acidity;
- Alkalinity;
- Major cations for Ca, Mg, Na and K;
- Major anions for Cl, F and SO₄; and
- Dissolved metals/metalloids for Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Hg, Mo, Mn, Ni, Pb, Sb, Se, Te, Th, U, V and Zn.

All kinetic geochemical results are provided in Appendix B.

4. GEOCHEMICAL RESULTS

4.1 ACID BASE ACCOUNT

4.1.1 PH VALUE

The pH value of the 260 waste rock samples ranged from slightly acidic (4.5) to slightly basic (8.8), with a neutral median pH value of 6.7. The standard deviation (SD) of the dataset is 1.0. In general, most waste rock samples are in the neutral range (Figure 10). However, slightly acidic samples are also prevalent, indicative of the waste rock lithology (largely felsic volcanics).

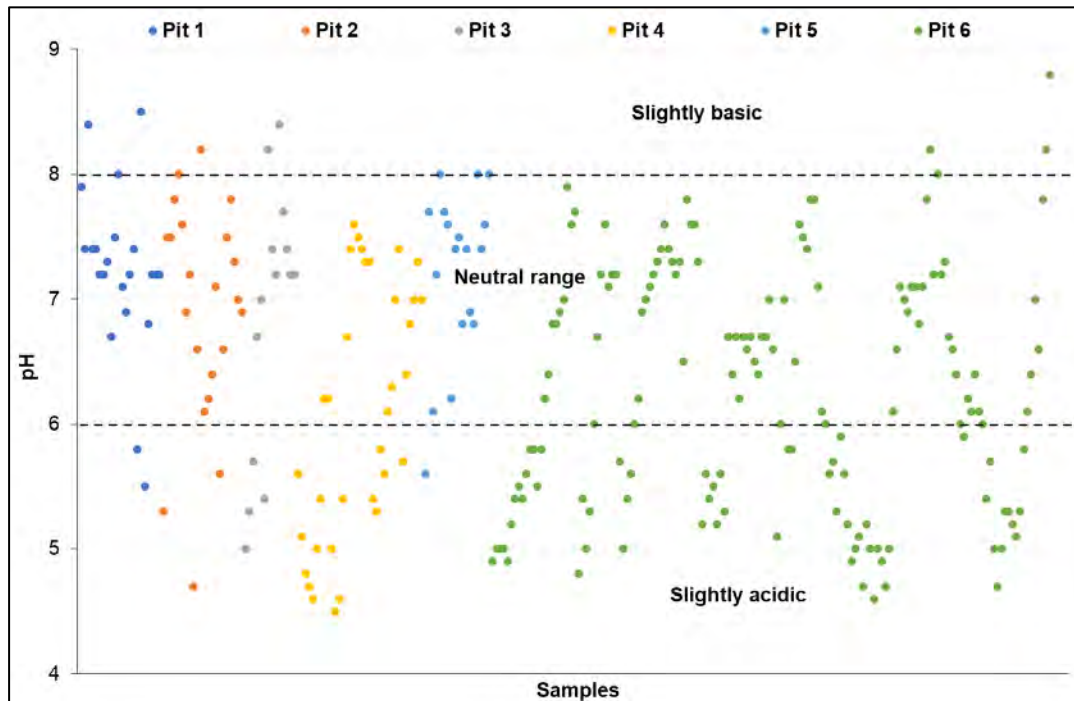


Figure 10: pH values for Agate Creek waste rock samples.

Because of the method of testwork (i.e. fluid extract from crushed samples, with a very high surface area to solution ratio), it is expected that both the low and high pH results in the waste rock are a worst-case scenario. Therefore, it is envisaged that the pH of runoff from the proposed open-cut pits waste rock will not be as low or high as that reflected in the waste rock sample test results. Also, in order for significant runoff to occur at Agate Creek, the rainfall dilution factor would be expected to be greater than the 1:5 (sample:water) ratio used in the extract solutions for analysis. This, in turn, would counteract the resulting acidity or alkalinity.

4.1.2 ELECTRICAL CONDUCTIVITY (EC)

The EC of the 260 Agate Creek waste rock samples ranges from 7 $\mu\text{S}/\text{cm}$ to 1,680 $\mu\text{S}/\text{cm}$ and has a very low median value of 43.5 $\mu\text{S}/\text{cm}$. Most Agate Creek waste rock samples have low EC values (<300 $\mu\text{S}/\text{cm}$). Apart from an outlier in Pit 2 (1,680 $\mu\text{S}/\text{cm}$), EC values in all waste rock samples are below 500 $\mu\text{S}/\text{cm}$ (Figure 11).

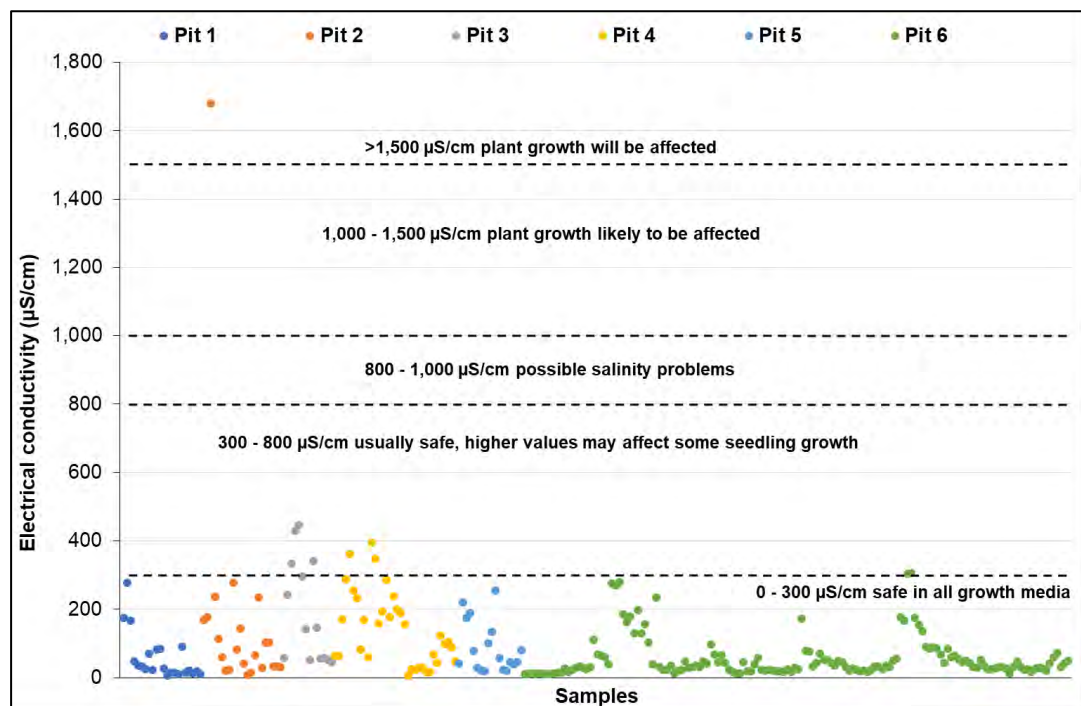


Figure 11: Electrical conductivity for Agate Creek waste rock samples.

4.1.3 TOTAL SULPHUR

The total sulphur (measured by LECO method) of the 260 Agate Creek waste rock samples ranged from <0.01% (i.e. below the limit of reporting [BLOR]) to 3.05%. The median is extremely low, with most samples BLOR. Most of the Agate Creek waste rock is therefore barren (<0.1%) with respect to total sulphur (Figure 12). Except for one value each in Pit 2 (3.05%) and Pit 6 (1.01%), all values above the barren level (i.e. >0.1%) are still classified as very low (<0.55%).

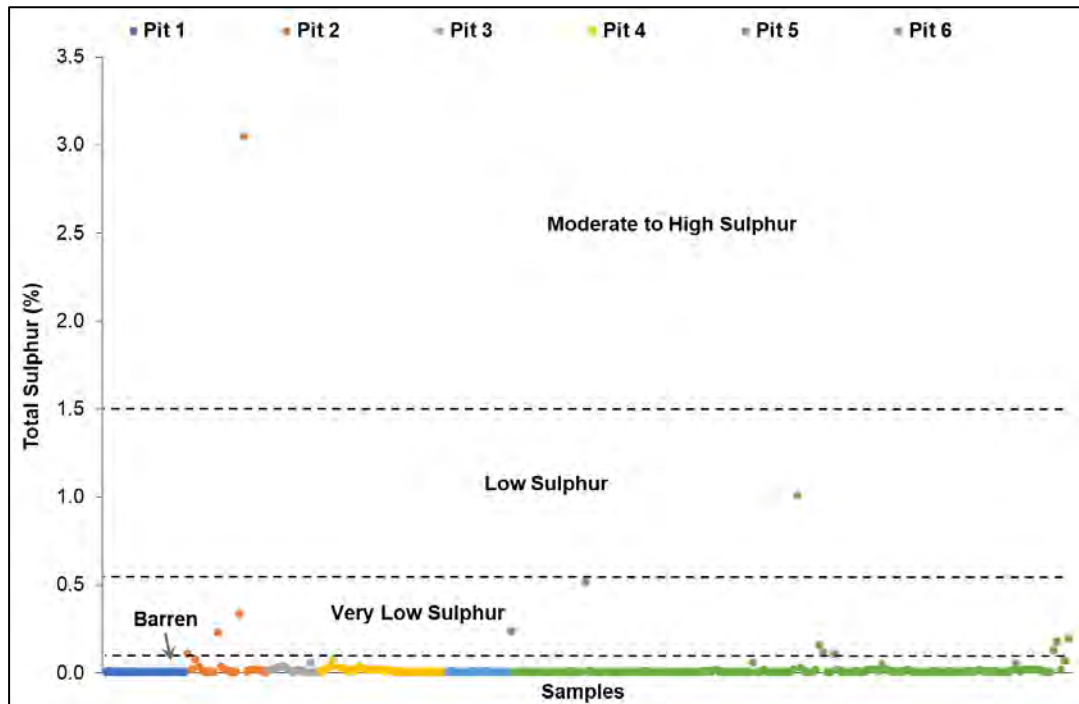


Figure 12: Total sulphur concentration for Agate Creek waste rock samples.

4.1.4 MAXIMUM POTENTIAL ACIDITY

Maximum potential acidity (MPA) is the maximum amount of acid that can be produced by the oxidation of sulphur-bearing minerals in the waste rock material. MPA is calculated from the total sulphur content. The MPA – that could be generated by the 260 Agate Creek waste rock samples – ranges from 0.15 to 93.3 kg H₂SO₄/t and has a low median value of 0.15 kg H₂SO₄/t.

4.1.5 ACID NEUTRALISING CAPACITY (ANC)

ANC is related to the amount of acid neutraliser (usually carbonate minerals) in the waste rock sample. ANC is determined experimentally by reacting a standardised acid mixture with a known amount of waste rock sample – and is reported as kg H₂SO₄/t eq. (equivalent). The ANC of the 260 Agate Creek waste rock samples ranges from 0.25 to 28.0 kg H₂SO₄/t eq., with a low median of 3.0 kg H₂SO₄/t eq.

4.1.6 ANC:MPA RATIO

The ANC:MPA ratio can assist in classifying the potential for waste rock samples to generate acid.

Generally speaking – and depending on the mineralogy – a sample with an ANC:MPA ratio below 1 is likely to be acid forming because it contains more acid-generating than acid-neutralising minerals. Samples with an ANC:MPA ratio of ≥ 1 but ≤ 2 have a degree of uncertainty and represent a potential risk, whereas samples with an ANC:MPA ratio of > 2 are generally low risk. However, there are exceptions because samples with an MPA of < 3.1 kg H₂SO₄/t are considered to contain insufficient acid-forming potential (i.e. they are barren). Conversely, samples with an MPA of > 3.1 but < 10 kg H₂SO₄/t would, at worst, be classified as low capacity, potentially acid-forming (PAF) material (Figure 13).

The 260 Agate Creek waste rock samples have an ANC:MPA ratio ranging from 0.08 to 183.01, with a median value of 11.93. According to these ANC:MPA ratios, with respect to acid-generation:

- 204 samples are considered to be of negligible to low risk;
- 41 samples are deemed to be a potential risk; and
- 15 samples are regarded as an increased risk.

This is because the low and negligible risk samples contain more acid-neutralising than acid-generating minerals, whereas the potential and increased risk samples contain more acid-generating than acid-neutralising minerals.

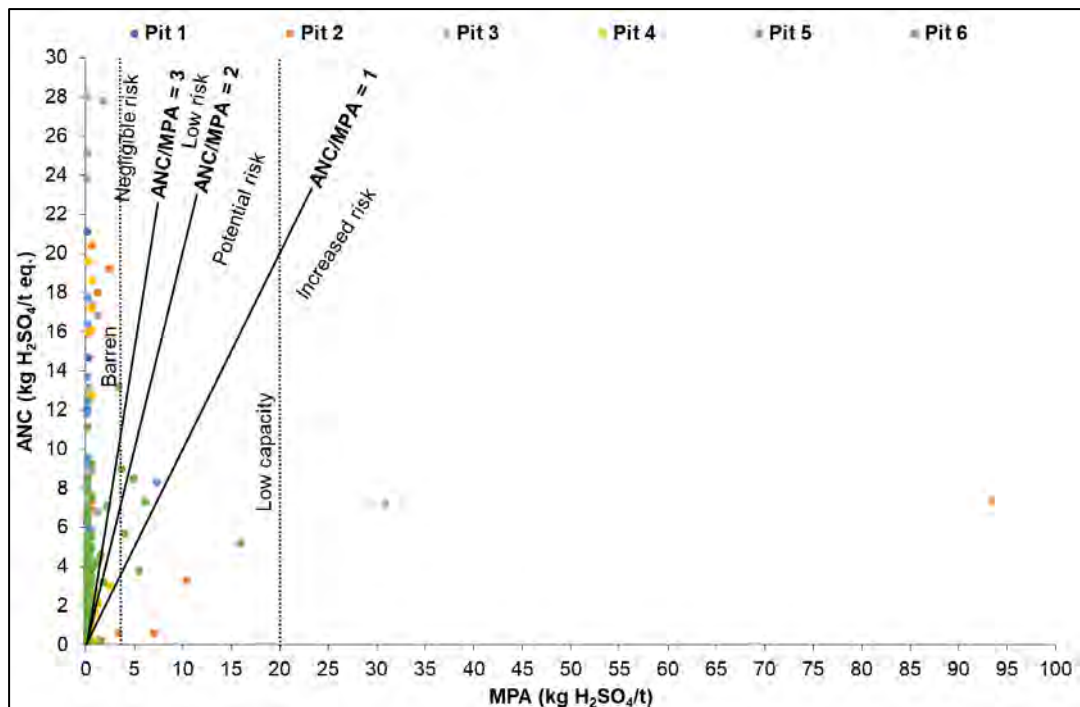


Figure 13: MPA versus ANC for Agate Creek waste rock samples.

4.1.7 NET ACID PRODUCTION POTENTIAL (NAPP)

NAPP is a theoretical calculation of the net acid producing (or consuming) value of a rock sample.

Generally speaking, samples with a negative NAPP value are non-acid forming (NAF), and those with a positive NAPP value are PAF. Miller (1997) provides further categorisation of waste rock material based on the magnitude of the NAPP value (Table 3).

Table 3: NAPP classification categories.

ARD Classification	NAPP Value (kg H ₂ SO ₄ /t)
Potentially acid forming (PAF)	> 10
Uncertain	0 to 10
Non-acid forming (NAF)	-50 to 0
Acid consuming material	< -50

Of the 260 waste rock samples, 45 have positive NAPP values. However, most of these positive samples are in the uncertain range, with only three samples having values greater than 10. These are associated with either Pit 2 or Pit 6.

4.2 NET ACID GENERATION (NAG) TEST

The NAG test is used to directly measure the net amount of acid produced by a waste rock sample.

Generally speaking, samples with a $\text{NAG}_{(\text{pH})}$ (oxidised pH) below 4.5 may be acid generating and samples with a $\text{NAG}_{(\text{pH})}$ equal or greater than 4.5 (≥ 4.5) are unlikely to be acid producing. However, the NAG test does not estimate acid neutralisation potential. Therefore, AMIRA (2002) recommends the combined use of the NAPP values and the NAG results for a more detailed classification of acid generation.

Figure 14 demonstrates that most Agate Creek waste rock samples have a $\text{NAG}_{(\text{pH})}$ of at least 4.5 and a NAPP value below 0. Therefore, they are not acid generating. In contrast, five samples have a negative NAPP value and $\text{NAG}_{(\text{pH})}$ below 4.5. In addition, several samples have NAPP values slightly above 0 that coincide with $\text{NAG}_{(\text{pH})}$ in excess of 4.5. Both groups are classified as uncertain PAF. Six samples are certainly PAF, having a $\text{NAG}_{(\text{pH})}$ less than 4.5 and a positive NAPP value (Figure 14).

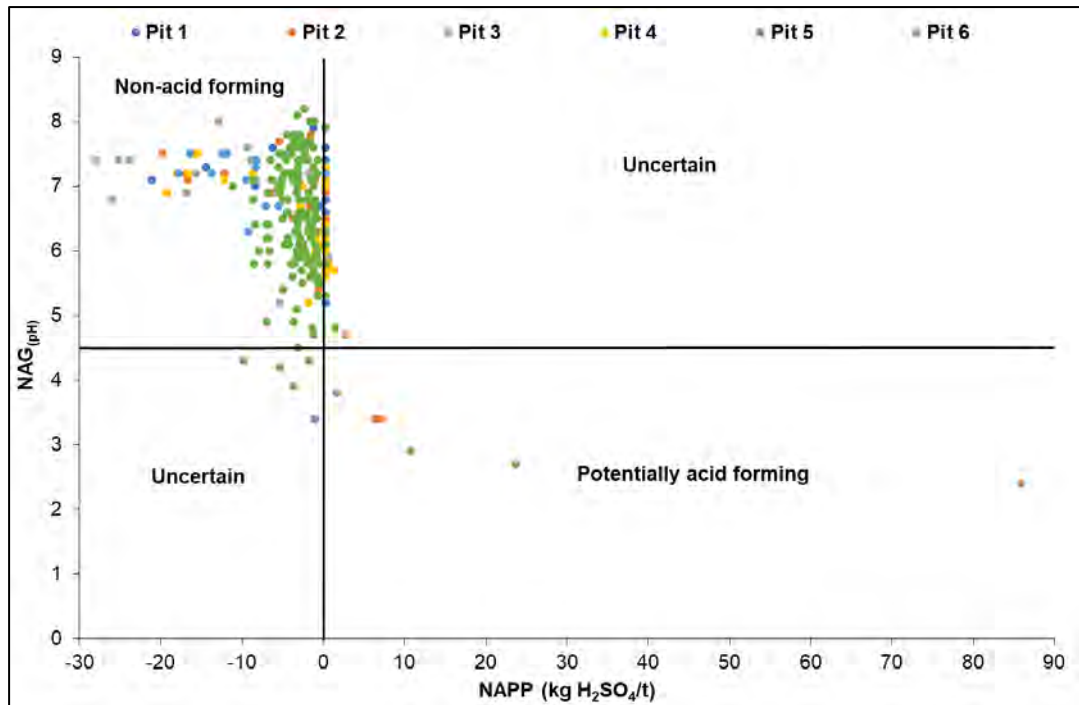


Figure 14: $\text{NAG}_{(\text{pH})}$ versus NAPP for Agate Creek waste rock samples.

A summary of the $\text{NAG}_{(\text{pH})}$ versus total sulphur geochemical classification criteria for the waste rock samples is presented in Table 4.

Table 4: Geochemical classification criteria for Agate Creek waste rock samples.

Geochemical Classification	Total Sulphur (%)	NAG _(pH)	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5	Pit 6
NAF (barren)	≤0.1	-	22	18	14	34	17	142
NAF (very low sulphur)	>0.1 to ≤0.55	≥ 4.5	0	1	0	0	0	1
NAF (low sulphur)	0.55 to 1.5	≥ 4.5	0	0	0	0	0	0
PAF (very low sulphur)	0.1 to ≤0.55	< 4.5	0	2	0	0	1	6
PAF (low sulphur)	0.55 to 1.5	< 4.5	0	0	0	0	0	1
PAF (moderate to high sulphur)	>1.5	< 4.5	0	1	0	0	0	0
Percentage of NAF samples			100%	86.4%	100%	100%	94.4%	95.3%
Percentage of very low sulphur PAF samples			0%	9.1%	0%	0%	6%	4.0%
Percentage of low sulphur PAF samples			0%	0%	0%	0%	0%	0.7%
Percentage of moderate to high sulphur PAF samples – actionable levels			0%	4.5%	0%	0%	0%	0%

Applying the NAG_(pH) and total sulphur geochemical classification criteria (Table 4), it can be shown that most waste characterisation samples are NAF (Figure 15).

Of the 260 Agate Creek waste rock samples, there are only 11 samples that could be categorised as PAF when the NAG_(pH) and total sulphur values are considered:

- Three samples in Pit 2;
- One sample in Pit 5; and
- Seven samples in Pit 6.

These samples make up less than 14% of the total sample size for their respective areas – and their sulphur values are still very low to low except for one sample in Pit 2. It is therefore expected that only one of these eleven samples presents an acid drainage issue because:

- The amount of produced acid would be negligible; and
- Any acid produced by the samples will be buffered by the surrounding NAF rock that makes up more than 90% of the waste rock.

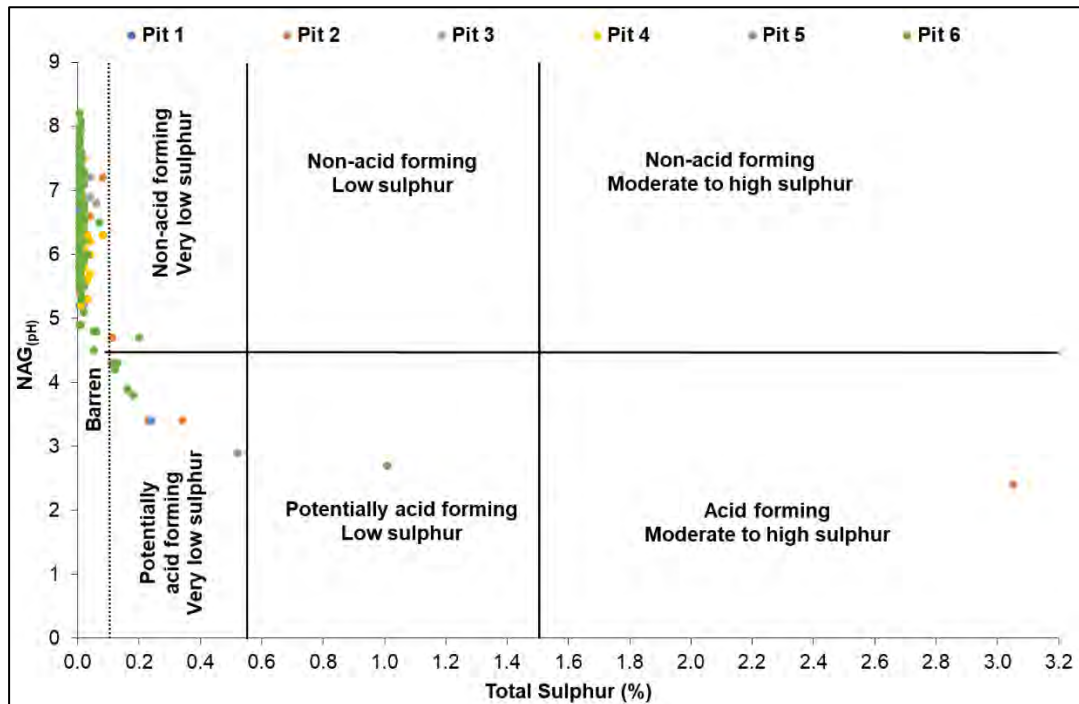


Figure 15: NAG_(pH) versus sulphur for Agate Creek waste rock samples.

4.3 METAL/METALLOID ANALYSES

Static multi-element scans were undertaken on the 260 Agate Creek waste rock samples. This test work was carried out to assess natural background elemental levels, and to identify if any elements (particularly metals and metalloids) are present in the waste rock at concentrations that may be of environmental concern with respect to revegetation and water quality.

4.3.1 GEOCHEMICAL ABUNDANCE INDEX

The total metal and metalloid concentrations in the waste rock can be compared to the average crustal abundance of unmineralised soils (INAP, 2014). In this process, the geochemical abundance index (GAI) is used to report on the extent of elemental enrichment, by relating the actual concentration in a sample with the average crustal abundance on a log₂ scale (Table 5).

Table 5: Geochemical abundance index classification categories.

GAI	Enrichment Factor	Classification
<1	Less than 3-fold enrichment	Not enriched
1	3- to 6-fold enrichment	Not enriched
2	6- to 12-fold enrichment	Slightly enriched
3	12- to 24-fold enrichment	Significantly enriched
4	24- to 48-fold enrichment	Significantly enriched
5	48- to 96-fold enrichment	Highly enriched
6	Greater than 96-fold enrichment	Highly enriched

As a general guide, samples with a GAI of 3 or greater indicate enrichment that may warrant further investigation. However, elements identified as enriched may not necessarily be a reason for concern regarding revegetation and/or water quality because:

- The average crustal abundance varies between different literature sources;
- Some elements are more environmentally important than others (i.e. As, Al, Cr, Cd, Cu, Pb, Se and Zn are more important than Ca, Fe, Mg and Na);
- If a sample is shown to be enriched in a particular element, there is no direct correlation that the sample will leach the element at elevated concentrations; and
- The nature of an ore deposit means that the background levels for some elements are expected to be elevated.

Similarly, because an element is not enriched does not mean that it will never be a concern because – under certain conditions (e.g. low pH) – the solubility of some common, environmentally important elements (such as Al, Cu, Cd, Fe and Zn) will increase significantly.

Summaries of the multi-element scans and GAIs for the Agate Creek waste rock samples are presented in Table 6. Boron was intentionally left out of these tables because all of the test results ($n = 260$) were BLOR (<50 mg/kg). Similarly, all tellurium values were BLOR (<0.5 mg/kg), although the number of measurements (four) is limited. The limit of reporting is well above the normal crustal abundance of tellurium, which is approximately a hundred times lower.

Any laboratory analyses that were reported as BLOR were not included in the GAI-related statistical analysis. The BLOR data were purposely omitted to minimise bias in the GAI calculation and resulting statistics.

Table 6: Summary of multi-element analyses, results and geochemical abundance indices for Agate Creek waste rock samples.

Element	Unit	Limit of Reporting	ACA*	n	n [#]	Concentration Statistics			NEPM Guideline HIL~ 'Recreational C'	GAI Statistics			
						Min.	Median	Max.		Min. GAI	Median GAI	Max. GAI	Number of GAIs ≥3
Aluminium	mg/kg	50	82,000	260	260	380	1,300	41,000	-	0	0	0	0
Antimony	mg/kg	0.1	0.2	4	4	0.2	0.4	1.8	-	0	0	2	0
Arsenic	mg/kg	5	1.5	260	154	BLOR [^]	6.5	206	300	1	2	6	42
Barium	mg/kg	10	500	260	206	BLOR	20	530	-	0	0	0	0
Beryllium	mg/kg	1	2.6	260	33	BLOR	BLOR	6	90	0	0	0	0
Cadmium	mg/kg	1	0.11	260	6	BLOR	BLOR	2	90	2	2.5	3	3
Chromium	mg/kg	2	100	260	245	BLOR	8	90	300	0	0	0	0
Cobalt	mg/kg	2	20	260	196	BLOR	5	190	300	0	0	2	0
Copper	mg/kg	5	50	260	206	BLOR	11	364	17,000	0	0	2	0
Iron	mg/kg	50	41,000	260	260	380	15,650	107,000	-	0	0	0	0
Lead	mg/kg	5	14	260	195	BLOR	9	111	600	0	0	2	0
Manganese	mg/kg	5	950	260	243	BLOR	192.5	4,260	19,000	0	0	1	0
Mercury	mg/kg	0.1	0.05	260	2	BLOR	BLOR	0.3	80	2	2	2	0
Molybdenum	mg/kg	0.1	1.5	4	4	0.2	1.85	3.7	-	0	0	0	0
Nickel	mg/kg	2	80	260	232	BLOR	8	291	1,200	0	0	1	0
Selenium	mg/kg	5	0.05	260	1	BLOR	2.5	8	700	6	6	6	1
Thallium	mg/kg	0.1	0.6	4	1	BLOR	BLOR	0.1	-	0	0	0	0
Thorium	mg/kg	0.1	12	4	4	0.6	0.85	1.7	-	0	0	0	0
Uranium	mg/kg	0.1	2.4	4	4	0.3	0.45	0.6	-	0	0	0	0
Vanadium	mg/kg	5	160	260	191	BLOR	9	406	-	0	0	0	0
Zinc	mg/kg	5	75	260	238	BLOR	35	395	30,000	0	0	1	0

* Average crustal abundance (Bowen, 1979).

[#] Number of reported measurements that were not below the limit of reporting.

~ *National Environment Protection (Assessment of Site Contamination) Measure 1999 – Health-based investigation levels* (NEPC, 2013).

[^] Below limit of reporting.

Red shaded cells are above the NEPM HIL Guidelines for 'Recreational C' areas.

Orange shaded cells indicate significant enrichment (i.e. ≥ 12 – 24 fold enrichment with respect to the average crustal abundance).

Based on the GAI assessment of the Agate Creek waste rock samples, approximately 27% of the waste rock samples are significantly enriched with respect to arsenic (Table 6). Most ($n = 30$) of the enriched arsenic samples ($n = 42$) have a GAI of 3, with a further nine samples attributed a GAI of 4. Two arsenic samples are associated with a GAI of 5, whereas only one sample reaches a GAI of 6.

The sole sample with selenium above the limit of reporting suggests that the waste rock is significantly enriched with respect to that trace element. However, a GAI of 5 would be obtained even if half of the LOR value (2.5 mg/kg) were to be applied to the GAI assessment. Thus, because of analytical limitations in measurement precision, any sample that included selenium testing would automatically be associated with a high GAI.

Of the six cadmium samples at or above the LOR, only three results reached a GAI of 3.

4.3.2 CONTAMINANT LIMITS

The metals/metalloid concentrations of the 260 Agate Creek waste rock samples have been compared against the National Environment Protection Measure (NEPM) health-based investigation level (HIL) guidelines for 'Recreational C' – public open space scenario (National Environment Protection Council [NEPC], 2013). Table 6 demonstrates that all analysed metals/metalloids would meet the 'Recreational C' limits.

4.4 STATIC WATER QUALITY ANALYSES

Static water quality multi-element scans were undertaken on water extracts from the 260 Agate Creek waste rock samples. This testwork was carried out in order to assess water quality characteristics (particularly salinity and soluble anion levels) that could potentially be sourced from the waste rock in leachate.

Before data analysis was undertaken, results below the laboratory limit of reporting (LOR) were entered into the database as half the LOR value, in line with the *Australian and New Zealand guidelines for fresh and marine water quality* (ANZECC and ARMCANZ, 2000). Also based on the dilution ratio (1:5) and EC values of the water extracts, all values reported as mg/kg are assumed to be the equivalent in mg/L.

There are no specific regulatory criteria for salinity or anion concentrations from waste rock material on mine sites in Queensland. Furthermore, the current EA for Agate Creek does not specify contaminant release limits for salinity or soluble anions. Consequently, the results for the waste rock water extracts have been compared with the ANZECC and ARMCANZ (2000) guidelines for livestock drinking water.

Note: It is inappropriate to use the ANZECC and ARMCANZ (2000) freshwater ecosystems guidelines to compare the anion and EC levels of the water extracts with environmental trigger levels. This is because the freshwater ecosystems guidelines do not contain anion trigger values. Further, the guidelines only apply tropical criteria for salinity triggers in the Agate Creek area – and do not consider the local geological and climatic conditions (i.e. Agate Creek is in a volcanic province that receives relatively low and highly seasonal rainfall).

4.4.1 SALINITY

The EC of the water extracts from the 260 Agate Creek waste rock samples ranges from 7 $\mu\text{S/cm}$ to 1,680 $\mu\text{S/cm}$ and has a very low median value of 43.5 $\mu\text{S/cm}$. These EC values generally represent fresh water and are well below the ANZECC and ARMCANZ (2000) livestock drinking water trigger limit of 5,970 $\mu\text{S/cm}$ (Figure 16). Further, the Queensland Government document *Science Notes – Land series – L137* (provided in Appendix C), states that 1,500 to 2,000 $\mu\text{S/cm}$ soil (using a 1 in 5 static test method) is considered slightly saline.

The study only recorded one sample in this range with all other static samples recording values well below 500 $\mu\text{S}/\text{cm}$ (Figure 16). This suggests that salinity is not an issue associated with the Agate Creek Mine waste rock.

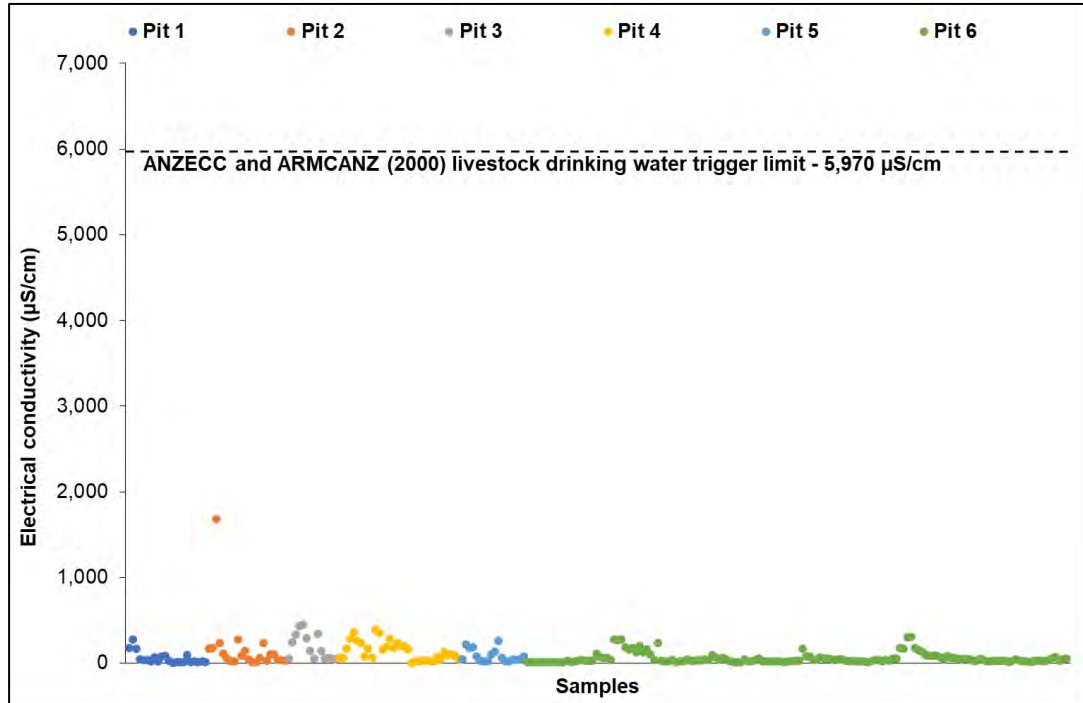


Figure 16: Electrical conductivity for water extracts from Agate Creek waste rock samples.

It should be noted that the ECs of the water extracts are higher than that expected of the surface runoff and seepage from the proposed waste rock material. This is because dissolution rates will be lower in the waste rock dumps than observed in the static laboratory samples. The KLC tests demonstrate this, with lower electrical conductivity values recorded compared to the static results (refer to Section 4.5.2).

4.4.2 FLUORIDE

The fluoride values of the water extracts from the 260 Agate Creek waste rock samples ranges from BLOR (<1 mg/kg) to 63 mg/kg and has a median value of 4 mg/kg. In the 260 water extracts, fluoride exceeded the low-risk trigger level for livestock drinking water (2 mg/L; ANZECC & AMRICANZ, 2000) on multiple occasions (Figure 17). While this guideline value is not directly comparable to the results (as the guideline is for surface waters [mg/L] and not sediment extracts [mg/kg]), exceedances may be of a concern as elevated fluoride is prevalent in most of the waste rock (Table 7). However, these fluoride levels are not unusual for the Agate Creek area. As a volcanic province, much of the rock, surface water and groundwater are enriched with respect to fluoride. Therefore, the risk of fluoride – sourced from the Agate Creek waste rock – further enriching fluoride levels in the receiving environment is low.

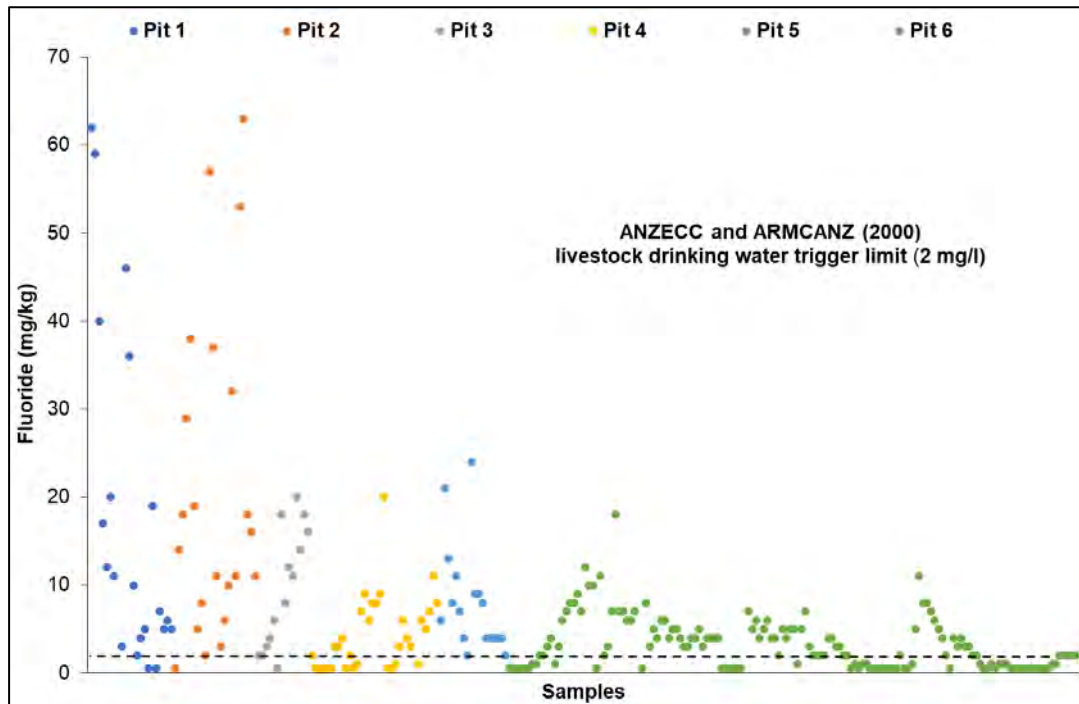


Figure 17: Fluoride values for water extracts from Agate Creek waste rock samples.

Table 7: Fluoride statistics for waste rock sample water extracts.

Fluoride Statistic	Unit	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5	Pit 6
Minimum	mg/L	0.5	0.5	0.5	0.5	2	0.5
Median	mg/L	10	15	9.5	3	6.5	3
Maximum	mg/L	62	63	20	20	24	18
SD	mg/L	19	18	7	4	6	3
cv	%	1.1	0.9	0.7	1.0	0.8	1.0
n	-	21	22	14	33	18	148
Percentage of samples exceeding 2 mg/L		85.7%	90.9%	78.6%	57.6%	88.9%	49.3%

^ BLOR – Below the limit of reporting.

4.4.3 SULPHATE

The dissolved sulphate levels of the water extracts from the 260 Agate Creek waste rock samples range from 5 mg/kg to 1,780 mg/kg and have a low median value of 20 mg/kg. Except for one value (a sample in Pit 2), all results were below the ANZECC and ARMCANZ (2000) beef cattle livestock drinking water trigger limit of 1,000 mg/L (if applied as 1,000 mg/kg; Figure 18). However, the guideline is only used to provide an indication of elevated levels and an exceedance displayed in Figure 18 does not necessarily imply the sample is toxic to cattle. This is because the guideline is developed for surface waters [mg/L] and not sediment extracts [mg/kg]. Instead, these results suggest that sulphate levels within waste rock are not of concern to the environmental values associated with the site.

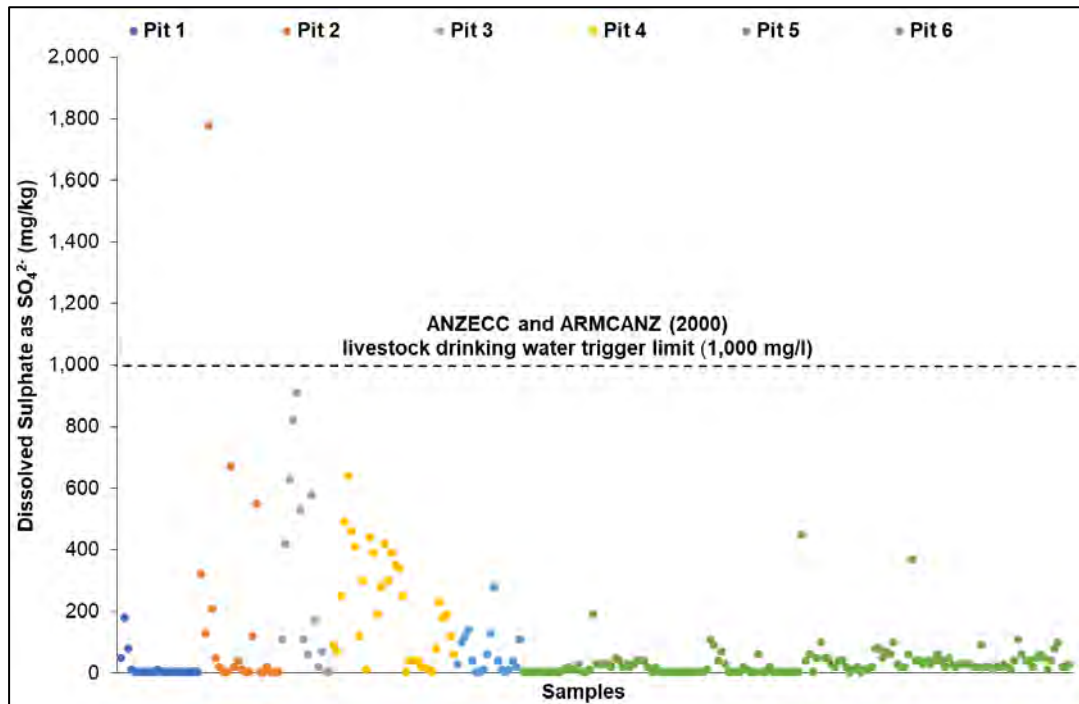


Figure 18: Sulphate values for water extracts from Agate Creek waste rock samples.

4.5 KINETIC LEACH COLUMN WATER QUALITY ANALYSES

In order to understand the potential for the Agate Creek waste rock to leach environmental contaminants into the surrounding environment, KLC tests were undertaken on four composite samples (refer to Section 3.2.2). Unlike static tests, KLC tests measure the varying geochemical characteristics of sample effluent over a prolonged period, consequently providing a better indication of chemical reactivity of waste materials under potential storage conditions.

The results of the waste rock KCL tests have to be considered against the mineralogy, and thus the chemical composition of the host rock and its associated complex hydrothermal alteration assemblages. The waste rock will be dominated by the host rock assemblage of rhyolite and andesite. Mineralogically, the composition of the rhyolite is dominated by alkali feldspars > plagioclase feldspars and quartz with minor biotite, muscovite, pyroxenes, amphiboles, oxides, and glass. Comparably, the mineralogical composition of andesites is dominated by plagioclase feldspars and amphiboles, with minor amounts of quartz, pyroxene, biotite and muscovite.

The composition of the primary mineralogy will be supplemented by material from the complex alteration assemblages (refer Section 2.2). The majority of the rocks will, to some degree, have been subjected to recent weathering cycles which will have changed the primary and alteration mineralogy to a series of minerals of very fine to colloidal particle size, including clay minerals (illite, smectites, kaolinite and mixed layer variants), and hydrated oxyhydroxides of Al, Fe and Mn (e.g. gibbsite, goethite and “birnessite”).

It is the reaction of the above mineral phases that determine the composition of the leach fluid.

Before data analysis was undertaken of the leach data, results below the laboratory LOR were entered into the database as half the LOR value, in line with the *Australian and New Zealand guidelines for fresh and marine water quality* (ANZG, 2018).



There are no specific regulatory criteria for contaminant releases from waste rock material on mine sites in Queensland. Furthermore, the current EA for Agate Creek does not specify contaminant release limits. Consequently, the results for the KLC tests are compared with the ANZG (2018) guidelines for freshwater ecosystems (95% species protection level) and livestock drinking water (Table 8).

Table 8: Summary of kinetic leach multi-element analyses and results.

Quality Characteristic	Limit of Reporting	Livestock Guideline ¹	Freshwater Ecosystems Guideline ²	Bore ID	Leach 0	Leach 1		Leach 2		Leach 3		Leach 4		Leach 5	
					V	V	C	V	C	V	C	V	C	V	C
pH ³	0.01	5 – 9	NA ⁴	CCGC339	6.49	6.50	-	6.24	-	6.48	-	6.15	-	6.30	-
				CCGC346	5.82	6.30	-	5.88	-	5.98	-	5.59	-	5.45	-
				CCGC309	6.38	5.51	-	6.53	-	6.87	-	5.48	-	6.00	-
				CCGC336	5.84	5.88	-	5.57	-	5.66	-	5.40	-	5.55	-
EC ³ (µS/cm)	1	5,970 ⁵	NA ⁴	CCGC339	553	68	-	49	-	44	-	41	-	36	-
				CCGC346	231	223	-	43	-	38	-	36	-	36	-
				CCGC309	20	14	-	15	-	14	-	10	-	17	-
				CCGC336	38	13	-	21	-	21	-	25	-	18	-
Sulphate (mg/L)	1	1,000	NA	CCGC339	3	BLOR	3.5	BLOR	4	BLOR	4.5	BLOR	5	BLOR	5.5
				CCGC346	49	63	112	12	124	11	135	10	145	10	155
				CCGC309	BLOR	BLOR	1	BLOR	1.5	BLOR	2.0	BLOR	2.5	BLOR	3
				CCGC336	1	BLOR	1.5	BLOR	2	BLOR	2.5	BLOR	3	1	4
Fluoride (mg/L)	0.1	2	NA	CCGC339	6.6	4.0	10.6	2.4	13.0	2.1	15.1	2.0	17.1	2.1	19.2
				CCGC346	0.6	0.8	1.4	0.5	1.9	0.4	2.3	0.5	2.8	0.5	3.3
				CCGC309	0.4	BLOR	0.45	BLOR	0.5	BLOR	0.55	BLOR	0.6	BLOR	0.65
				CCGC336	0.2	BLOR	0.25	BLOR	0.3	BLOR	0.35	0.1	0.45	0.1	0.55
Aluminium (mg/L)	0.01	5	0.055	CCGC339	BLOR	0.07	0.075	0.16	0.235	0.02	0.255	0.01	0.265	0.02	0.285
				CCGC346	BLOR	0.01	0.015	0.04	0.055	0.02	0.075	BLOR	0.08	0.01	0.09
				CCGC309	0.06	0.01	0.07	0.01	0.08	0.01	0.09	BLOR	0.095	BLOR	0.10
				CCGC336	0.03	BLOR	0.035	BLOR	0.04	BLOR	0.045	BLOR	0.05	BLOR	0.055
Arsenic (mg/L)	0.001	0.5	0.013	CCGC339	BLOR	0.001	0.0015	BLOR	0.002	0.002	0.004	BLOR	0.0045	BLOR	0.005
				CCGC346	BLOR	BLOR	0.001	BLOR	0.0015	BLOR	0.002	BLOR	0.0025	BLOR	0.003
				CCGC309	BLOR	BLOR	0.001	BLOR	0.0015	BLOR	0.002	BLOR	0.0025	BLOR	0.003
				CCGC336	BLOR	BLOR	0.001	BLOR	0.0015	BLOR	0.002	BLOR	0.0025	BLOR	0.003
Boron (mg/L)	0.05	5	0.37	CCGC339	0.19	0.13	0.32	0.07	0.39	0.08	0.47	0.12	0.59	0.11	0.70
				CCGC346	0.17	1.15	1.32	0.18	1.5	0.19	1.69	0.25	1.94	0.30	2.24
				CCGC309	BLOR	BLOR	0.05	BLOR	0.075	BLOR	0.1	0.07	0.17	BLOR	0.195

Quality Characteristic	Limit of Reporting	Livestock Guideline ¹	Freshwater Ecosystems Guideline ²	Bore ID	Leach 0	Leach 1		Leach 2		Leach 3		Leach 4		Leach 5	
					V	V	C	V	C	V	C	V	C	V	C
				CCGC336	0.13	0.26	0.39	0.42	0.81	0.69	1.5	0.96	2.46	0.80	3.26
Cadmium (mg/L)	0.0001	0.01	0.0002	CCGC339	BLOR	BLOR	0.0001	BLOR	0.00015	BLOR	0.0002	BLOR	0.00025	BLOR	0.0003
				CCGC346	BLOR	BLOR	0.0001	BLOR	0.00015	BLOR	0.0002	BLOR	0.00025	BLOR	0.0003
				CCGC309	BLOR	BLOR	0.0001	BLOR	0.00015	BLOR	0.0002	BLOR	0.00025	BLOR	0.0003
				CCGC336	BLOR	BLOR	0.0001	BLOR	0.00015	BLOR	0.0002	BLOR	0.00025	BLOR	0.0003
Copper (mg/L)	0.001	1.0 ⁶	0.0014	CCGC339	BLOR	BLOR	0.001	0.001	0.002	BLOR	0.0025	BLOR	0.003	BLOR	0.0035
				CCGC346	BLOR	0.002	0.0025	BLOR	0.003	BLOR	0.0035	BLOR	0.004	BLOR	0.0045
				CCGC309	BLOR	BLOR	0.001	0.001	0.002	BLOR	0.0025	BLOR	0.003	BLOR	0.0035
				CCGC336	0.002	BLOR	0.0025	BLOR	0.003	BLOR	0.0035	BLOR	0.004	BLOR	0.0045
Lead (mg/L)	0.001	0.1	0.0034	CCGC339	BLOR	BLOR	0.001	BLOR	0.0015	BLOR	0.002	BLOR	0.0025	BLOR	0.003
				CCGC346	BLOR	BLOR	0.001	BLOR	0.0015	BLOR	0.002	BLOR	0.0025	BLOR	0.003
				CCGC309	BLOR	BLOR	0.001	BLOR	0.0015	BLOR	0.002	BLOR	0.0025	BLOR	0.003
				CCGC336	BLOR	BLOR	0.001	BLOR	0.0015	BLOR	0.002	BLOR	0.0025	BLOR	0.003
Manganese (mg/L)	0.001	NA	1.900	CCGC339	0.031	0.004	0.035	0.003	0.038	0.003	0.041	0.002	0.043	0.002	0.045
				CCGC346	0.018	0.035	0.053	0.003	0.056	0.004	0.06	0.003	0.063	0.004	0.067
				CCGC309	BLOR	BLOR	0.001	0.006	0.007	0.009	0.016	0.004	0.02	0.016	0.036
				CCGC336	0.015	0.006	0.021	0.017	0.038	0.015	0.053	0.013	0.066	0.007	0.073
Mercury (mg/L)	0.0001	0.002	0.0006	CCGC339	BLOR	BLOR	0.0001	BLOR	0.00015	BLOR	0.0002	BLOR	0.00025	BLOR	0.0003
				CCGC346	BLOR	BLOR	0.0001	BLOR	0.00015	BLOR	0.0002	BLOR	0.00025	BLOR	0.0003
				CCGC309	BLOR	BLOR	0.0001	BLOR	0.00015	BLOR	0.0002	BLOR	0.00025	BLOR	0.0003
				CCGC336	BLOR	BLOR	0.0001	BLOR	0.00015	BLOR	0.0002	BLOR	0.00025	BLOR	0.0003
Nickel (mg/L)	0.001	1.0	0.011	CCGC339	BLOR	BLOR	0.001	BLOR	0.0015	0.001	0.0025	BLOR	0.003	BLOR	0.0035
				CCGC346	BLOR	0.003	0.0035	BLOR	0.004	BLOR	0.0045	BLOR	0.005	BLOR	0.0055
				CCGC309	BLOR	BLOR	0.001	BLOR	0.0015	BLOR	0.002	BLOR	0.0025	BLOR	0.003
				CCGC336	BLOR	BLOR	0.001	BLOR	0.0015	0.001	0.0025	BLOR	0.003	BLOR	0.0035
Zinc (mg/L)	0.005	20	0.008	CCGC339	BLOR	BLOR	0.005	BLOR	0.0075	0.024	0.0315	BLOR	0.034	BLOR	0.0365
				CCGC346	BLOR	0.131	0.1335	BLOR	0.136	BLOR	0.1385	BLOR	0.141	BLOR	0.1435
				CCGC309	BLOR	BLOR	0.005	BLOR	0.0075	BLOR	0.010	BLOR	0.0125	BLOR	0.015

Quality Characteristic	Limit of Reporting	Livestock Guideline ¹	Freshwater Ecosystems Guideline ²	Bore ID	Leach 0	Leach 1		Leach 2		Leach 3		Leach 4		Leach 5	
					V	V	C	V	C	V	C	V	C	V	C
				CCGC336	BLOR	0.007	0.0095	0.011	0.0205	0.010	0.0305	0.006	0.033	0.007	0.040
Acidity ³ as CaCO ₃ (mg/L)	1	NA	NA	CCGC339	3	2	-	BLOR	-	3	-	1	-	3	-
				CCGC346	2	3	-	BLOR	-	3	-	1	-	3	-
				CCGC309	2	1	-	BLOR	-	2	-	2	-	3	-
				CCGC336	2	1	-	BLOR	-	3	-	2	-	3	-

¹ Australian guidelines for livestock drinking water - trigger values (low risk) (ANZG, 2018). Note: Metal guideline values are based on the total fraction, whereas results are provided as dissolved. Care must be taken when undertaking comparisons.

² Australian guidelines for aquatic freshwater ecosystems - 95% species protection level (ANZG, 2018). Note: Metal guideline values are based on the dissolved fraction.

³ Cumulative results are not provided for pH, EC or acidity as these values are deemed inappropriate for assessing these quality characteristics.

⁴ pH and EC guidelines for freshwater ecosystems for tropical regions are not representative of the climatic and/or geological conditions at Agate Creek.

⁵ EC has been calculated from the tolerances of livestock (beef cattle) to total dissolved solids in livestock drinking water using a 1.4925 multiplier (ANZG, 2018).

⁶ Cattle trigger value (low risk) for copper is cited.

Indicates an exceedance of the relevant livestock drinking water guideline value.

Indicates an exceedance of the relevant freshwater ecosystems guideline value.

V – Raw value.

C – Running cumulative total.

NA – Not available.

BLOR – Below the limit of reporting.

4.5.1 PH VALUE

The KLC results show that pH remains relatively stable over the course of the tests (Table 8 and Figure 19). Three of the samples show a marginal decreasing trend while CCGC309 recorded a drop in pH after the first leach before increasing over leaches 2 and 3 (Table 8 and Figure 19). While a marginal decrease over time is noted at most sites, no samples show a significant increase in acidity over time (Table 8; Figure 19 and Figure 20).

It should be noted that both pH and acidity are inherent properties of the mineralogical composition. Significant changes would only be expected if there were large changes in the overall mineralogy (e.g. total dissolution of phases) during the leaching process.

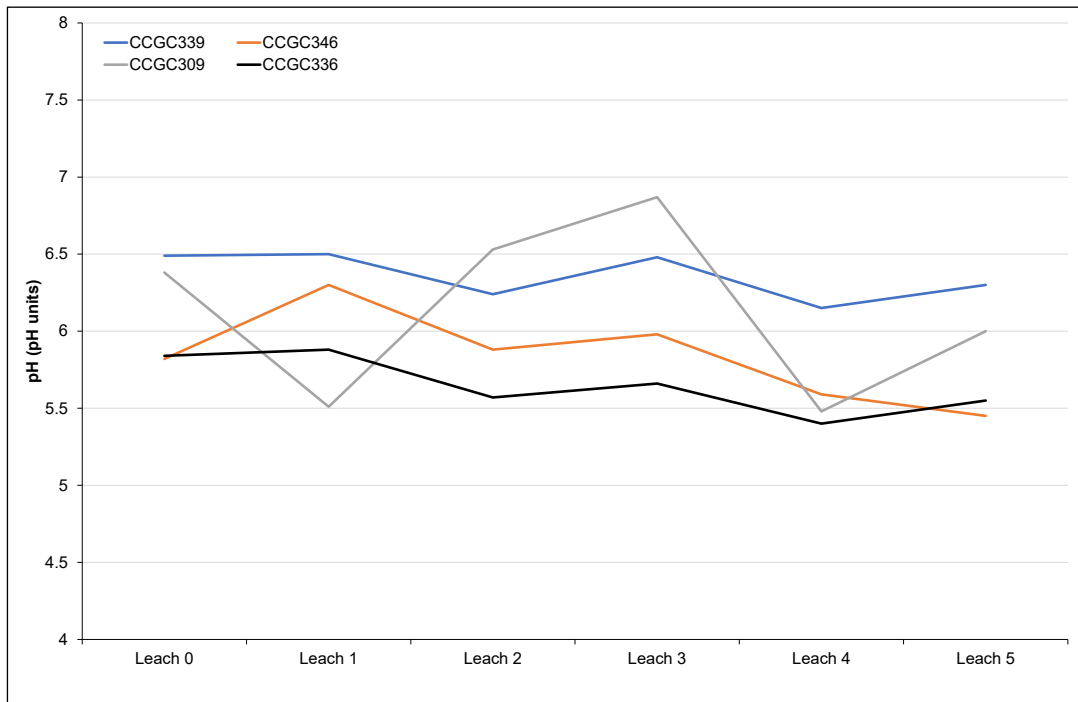


Figure 19: Trend in pH of each KLC tested sample over time.

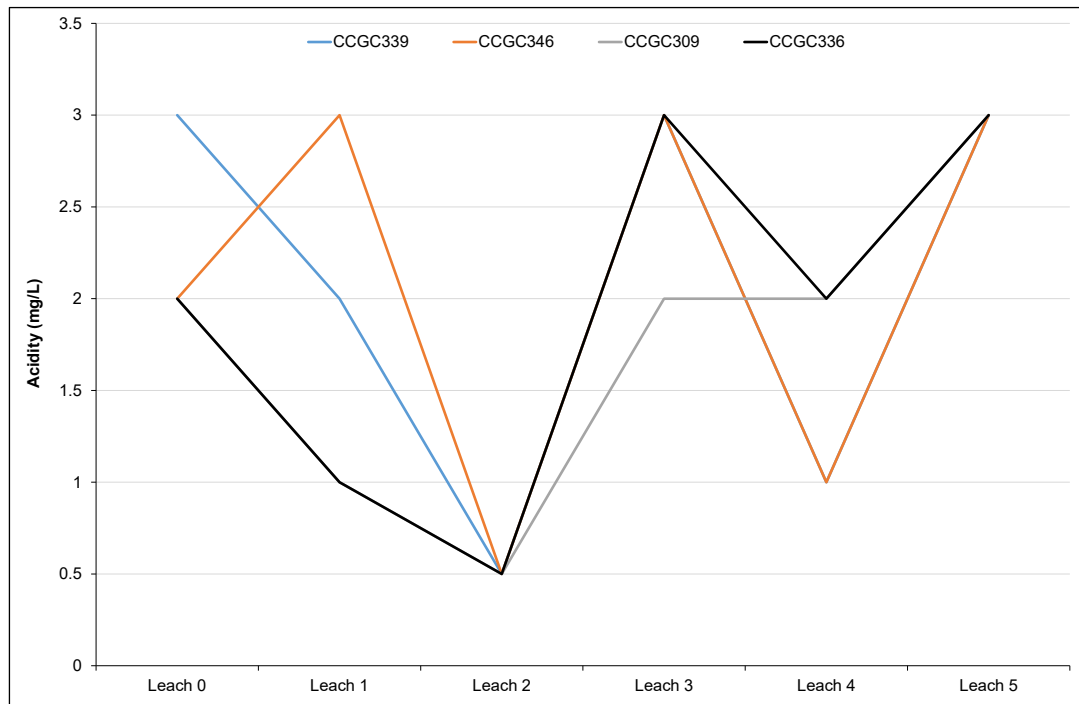


Figure 20: Trends in acidity observed in each KLC tested sample over time.

4.5.2 ELECTRICAL CONDUCTIVITY

Electrical conductivity is a property that will not accumulate over time with each value representing an individual snapshot in time. Thus, between successive leaches, conductivity in all samples generally falls, ranging from 553 to 20 $\mu\text{S}/\text{cm}$ in leach 0 to 41, to 10 $\mu\text{S}/\text{cm}$ in leach 4 (Table 8 and Figure 21). This is consistent with the general dilution of the leachate over time. These results indicate that each sample would still be considered freshwater under both the US Geological Survey guidelines (i.e. $<1,560 \mu\text{S}/\text{cm}$; refer to <https://www.usgs.gov/special-topics/water-science-school/science/saline-water-and-salinity>) and the Queensland Government (i.e. $<1,500 \mu\text{S}/\text{cm}$; refer to the Science Note provided in Appendix C). Therefore, salinity is not an issue associated with the Agate Creek Mine waste rock.

While electrical conductivity is not accumulative, the end products, upon evaporation (i.e. salts), are accumulative. This is true of any water evaporating in the bed sands of a stream where halite saturation (i.e. $\text{EC} > 300,000 \mu\text{S}/\text{cm}$) are achieved in the dry season.

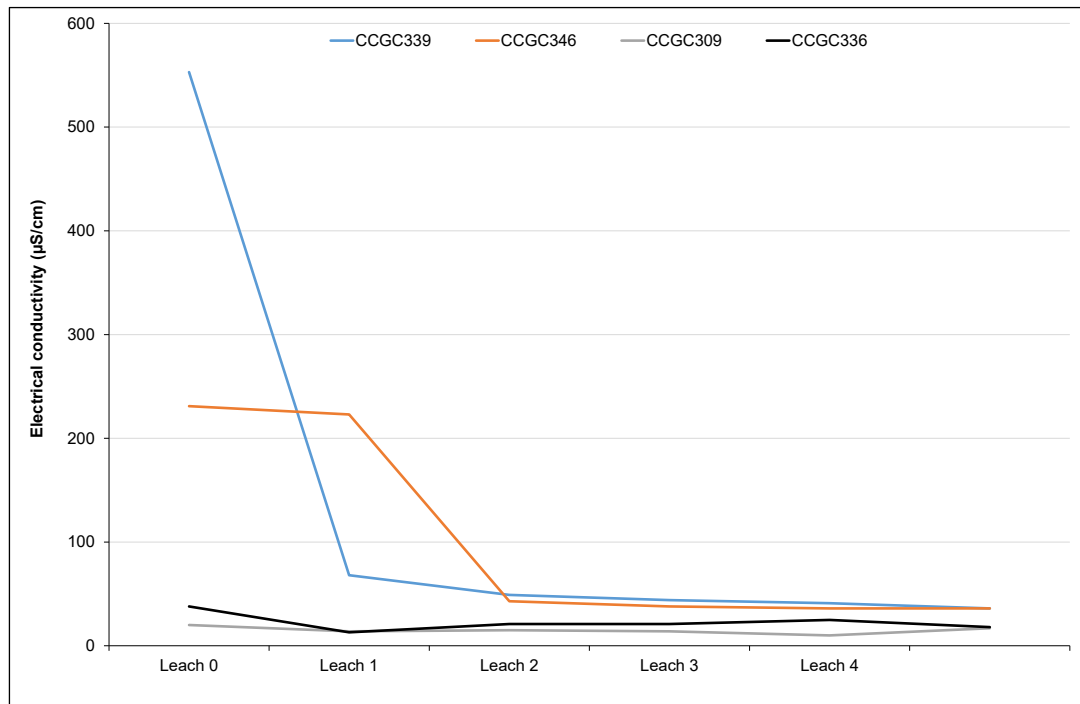


Figure 21: Trends in electrical conductivity observed in each KLC tested sample over time.

4.5.3 METALS / METALLOIDS

Most metal concentrations were found to be either compliant with relevant guideline values, or only exceeded these values in the cumulative results at the end of testing (Table 8). For instance, cadmium was recorded below the LOR in every sample tested. However, the cumulative results were found to exceed the 95% species protection level for aquatic ecosystems after leach 4 (Table 8). This is a result of the conservative method used to calculate the cumulative value in the event of below the LOR values (i.e. adopt a value equal to 50% of the limit of reporting), combined with the number of leaches performed, and the relatively low guideline value. Therefore, although the cumulative value for cadmium appears to have exceeded the aquatic ecosystem guideline value in leach 4, it is suggested that cadmium levels within Agate Creek Mine's waste rock are not of environmental concern.

With respect to metals and metalloids, cumulative values may be of use in assessing the total load that may build up by evaporation in any downstream sediments and may be available for later mobilisation in flow events.

Only four metals or metalloids were regularly recorded above their respective aquatic ecosystem guideline values (Table 8):

- Dissolved aluminium;
- Dissolved boron;
- Dissolved copper; and
- Dissolved zinc.

Values for aluminium (refer Figure 22 and Table 8) were opportunistic up to Leach 3 after which a consistent overall drop for all samples was observed. Erratic behaviour in Leaches 0 to 2 was shown by all samples, except for CCGC336. Non-compliance values (above 0.055 mg/L) were shown by CCGC309 in Leach 0 and CCGC339 in Leaches 1 and 2, with the value in Leach 2 exceeding 0.150 mg/L (Figure 22 and Table 8). After Leach 2, levels

in all samples decrease systematically. Accumulated values in all samples (except for CCGC336) exceed the 0.055 mg/L threshold (Figure 22 and Table 8).

As indicated above, individual levels are largely opportunistic, representing mineral availability to reaction at any particular time. Further, much of the “dissolved” aluminium will be in colloidal form.

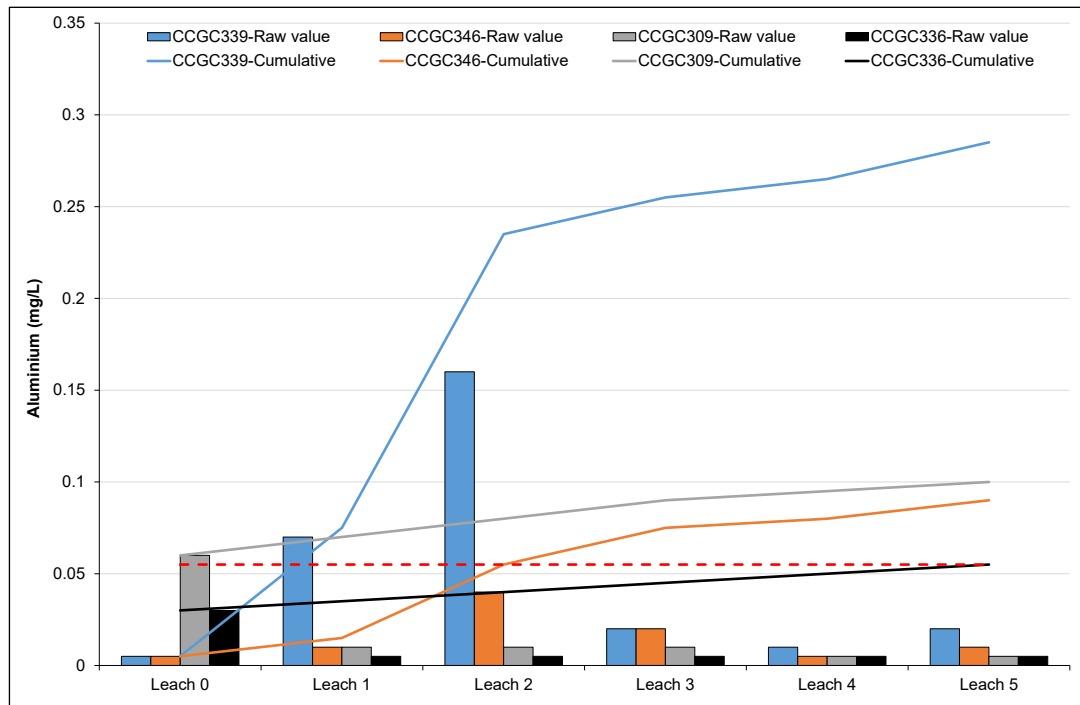


Figure 22: Cumulative trends and individual leach values of dissolved aluminium observed in each KLC tested sample over time compared against the ANZG (2018) 95% species protection level for freshwater systems (red dashed line).

Dissolved Boron levels reacted as expected in all samples (i.e. initially elevated and then relatively compliant levels in later leaches), except CCGC336 (Figure 23). CCGC336 (located in Pit 6) increased in dissolved boron concentrations with each subsequent leach, displaying an almost exponential cumulative rise in values up to leach 4. However, the results of leach 5 show the values of dissolved boron began to decrease (Figure 23). The relatively higher boron values from CCGC336 may be a response of the clay minerals present, in the sample, to the slight decrease in pH (increase in acidity) shown by the same sample over the 5 leaches.

Dissolved copper marginally exceeded the guideline value on two occasions in two separate samples (Figure 24). Both CCGC346 (from Pit 4) and CCGC336 (from Pit 6) recorded one result each above the guideline value with all other results from these two samples recorded below the LOR (Figure 24). Figure 24 shows the levels of copper within the waste rock quickly leach from the system at marginal levels prior to reducing to compliant concentrations. While the accumulation of copper within aquatic environments can be of environmental concern, it is predicted that the relatively low levels of copper leaching from the Agate Creek Mine waste rock are of negligible concern to its downstream receiving environment.

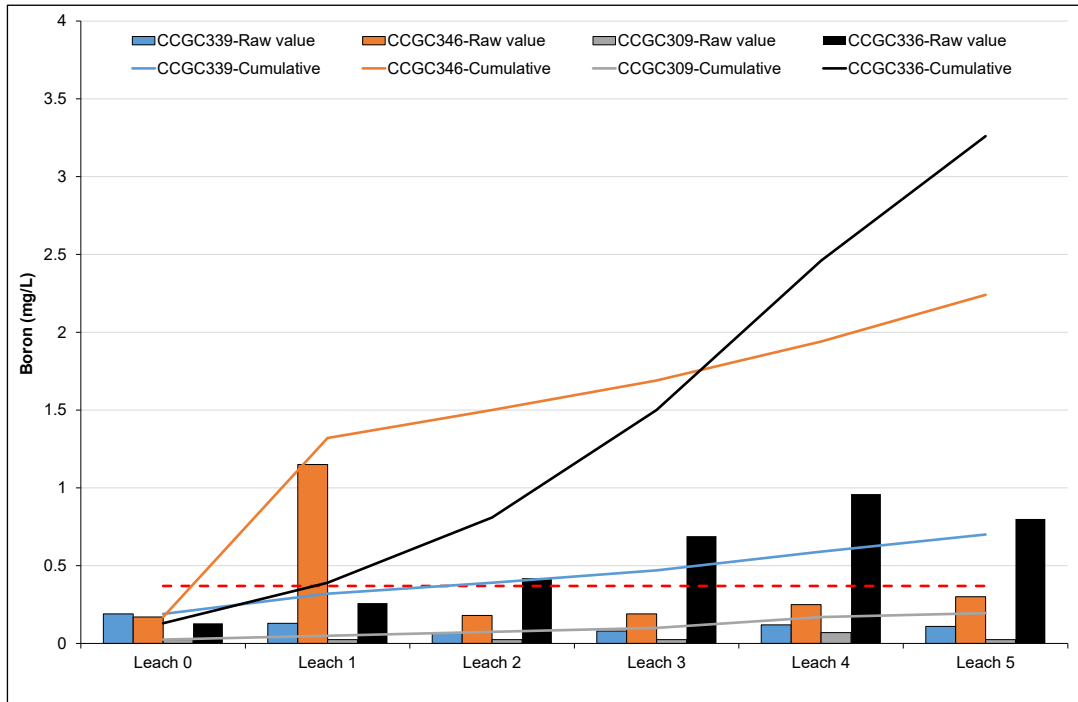


Figure 23: Cumulative trends and individual leach values of dissolved boron observed in each KLC tested sample over time compared against the ANZG (2018) 95% species protection level for freshwater systems (red dashed line).

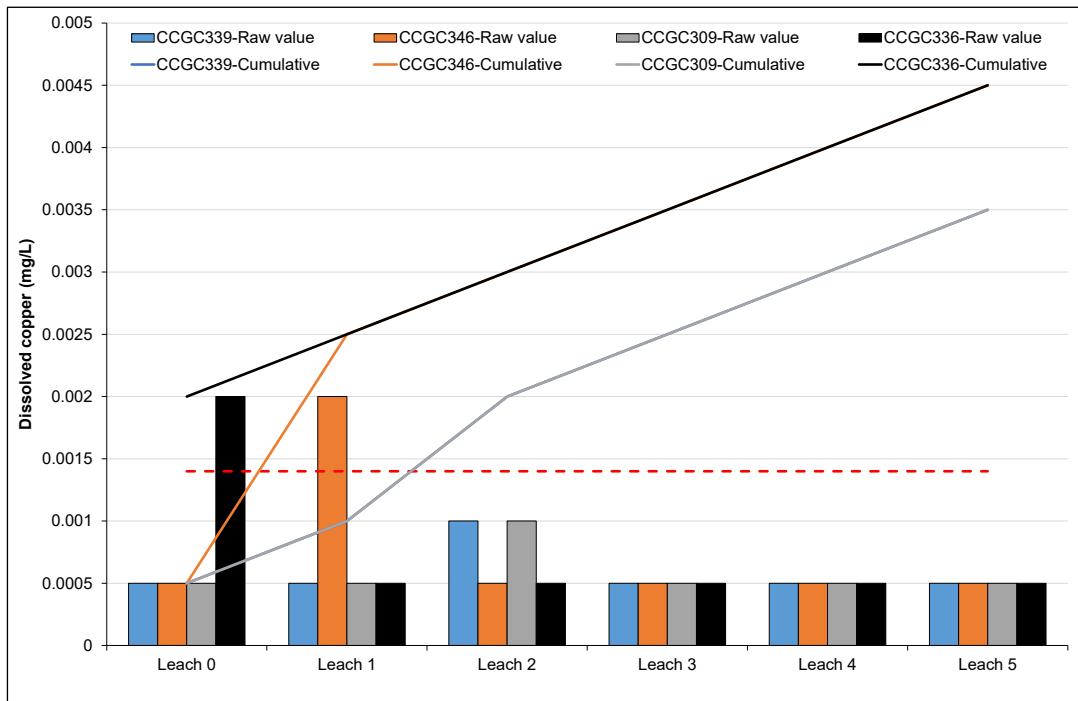


Figure 24: Cumulative trends and individual leach values of dissolved copper observed in each KLC tested sample over time compared against the ANZG (2018) 95% species protection level for freshwater systems (red dashed line).

During leach 1, CCGC346 (Pit 4) recorded one large spike of dissolved zinc (well above the aquatic ecosystem guideline level), but recorded levels below the LOR on every other occasion (Figure 25). CCGC309 (in Pit 6) is the only sample to record all values below the LOR, with no other site following any particular trend in results (Table 8 and Figure 25). In the absence of appreciable sulphate (i.e. evidence of sulphide oxidation) the behaviour of both copper and zinc are problematical. The most likely source of these metals into solution in the geological context (i.e. waste rock) is desorption from negatively charged manganese oxy-hydroxide colloids, and or, possibly negatively charged aluminium oxy-hydroxide colloids. Attempts to investigate these possibilities using correlation analyses have not been entirely successful. Possibly, by including adsorption on to smectite as an additional parameter may lead to success. Modelling at this level is beyond the scope of this current study.

Overall, it is considered likely that the probable sources of both copper and zinc are desorption from oxy-hydroxides and clays. This desorption would be opportunistic in the leaching solution as mineral species, and consequent value, may be elevated, but would be expected to show an overall decrease between successive leaches. This trend is generally consistent with the data up to Leach 5.

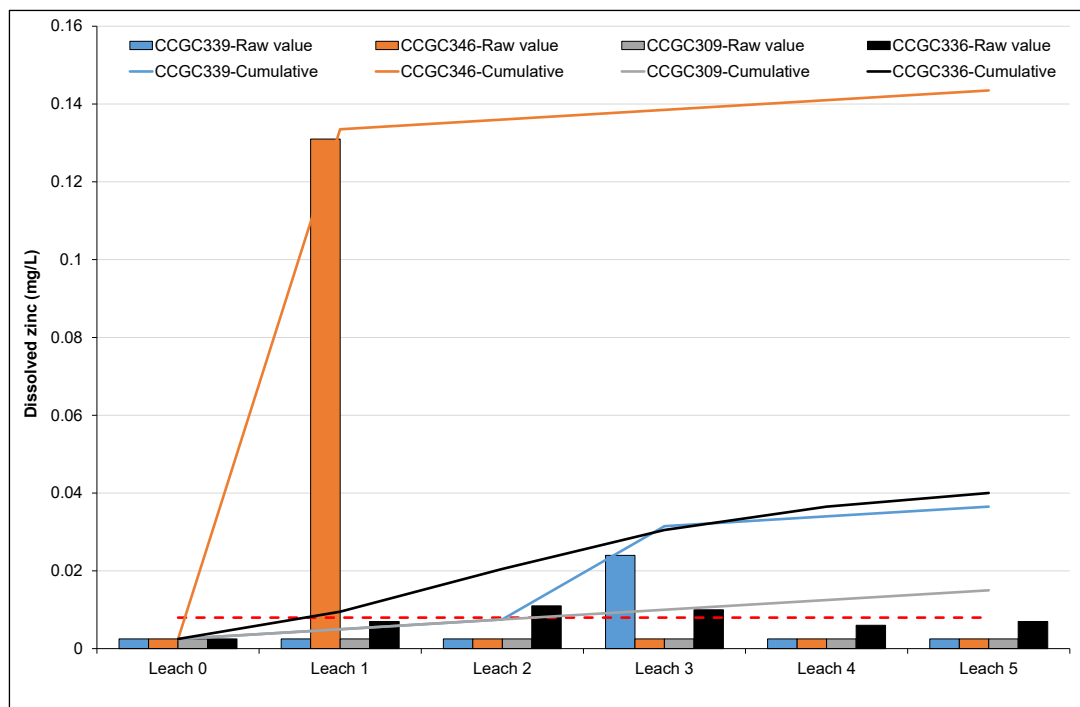


Figure 25: Cumulative trends and individual leach values of dissolved zinc observed in each KLC tested sample over time compared against the ANZG (2018) 95% species protection level for freshwater systems (red dashed line).

4.5.4 FLUORIDE

The KLC test results demonstrate that there is an expected overall accumulation of fluoride with successive leaching in sample CCGC339 (Table 8 and Figure 26). In all other samples (and particularly levels of fluoride), particulates are approximately constant with successive leaches.

For CCGC309, levels of fluoride fell from 6.6 mg/L in Leach 0, to 4 mg/L in Leach 1, to 2.0 mg/L in Leach 4 (Table 8 and Figure 26). The compliance level is 2.0 mg/L. The initial high level is probably due to the presence of the alteration mineral fluorite (CaF_2) and its dissolution. Successive leaches reduce the influence of this mineral by dissolution.

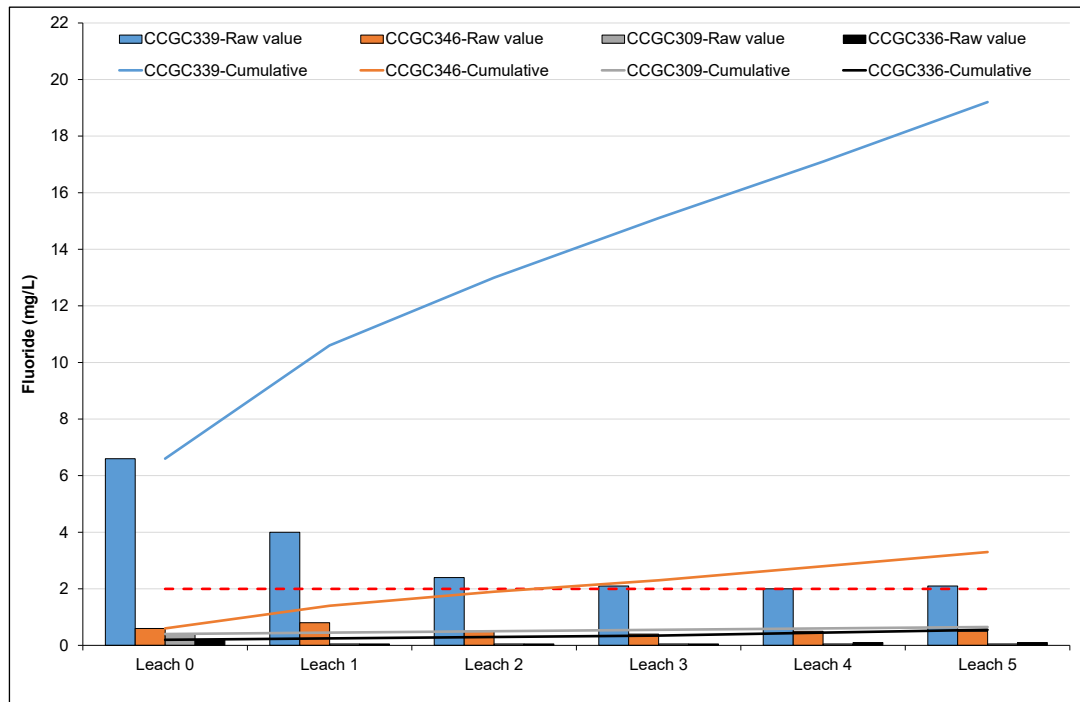


Figure 26: Cumulative trends and individual leach values of fluoride observed in each KLC tested sample over time compared against the ANZG (2018) livestock drinking water value (red dashed line).

5. CONCLUSION AND RECOMMENDATIONS

5.1 ACID MINE DRAINAGE

Static testing of 260 samples from Pits 1 to 6 from Agate Creek Mine were analysed for a broad range of analytes in manners consistent with the relevant protocols. Of the 260 samples analysed only 11 samples could be categorised as PAF. These samples are all found in Pits 2, 5 and 6 with 7 of the 11 being found in Pit 6. All of these, except for one sample in Pit 2, still only have very low to low sulphur values. Therefore, only one sample presents any possibility of acid mine drainage. Thus, it is expected that:

- The amount of any acid potentially produced will be small, and
- Any acid produced by the waste rock will be buffered by the surrounding NAF rock which makes up >90% of the waste rock.

Therefore, it is considered that the acid mine drainage risk posed by the waste rock associated with the project is very low.

5.2 SALINITY

The EC of water from the Agate Creek waste rock samples ranged from 7 to 1680 $\mu\text{S}/\text{cm}$ with a very low median value of 43.5 $\mu\text{S}/\text{cm}$. These values are all within (or similar to in the case of the maximum value) appropriate guideline values for freshwater systems. Therefore, it is considered that salinity is not an issued in the management of the Agate Creek waste rock piles.

5.3 ELEMENTS

A broad range of analytes were assessed in both the static leach tests and KLC tests, with the following results of note:

- **Fluoride:** Levels were above the target level of 2 mg/L in many of the 260 waste rock samples analysed using static tests. The range in values overall was >0.5 mg/L to 63 mg/L. These exceedances may be of concern as fluorine is present in most of the waste rock, principally in the alteration zone minerals (fluorite) and in the micas. However, these fluoride values are not universal for the Agate Creek area which is a volcanic province where fluorine enrichment is not unexpected. The possibility of a high ambient level implies that the overall risk associated with fluoride is low.

In the kinetic leach results, fluoride trended down to the compliance level of 2 mg/L by the 4th leach, supporting the overall proposition that the overall environmental risk from fluoride is low.

- **Sulphate:** The dissolved sulphate levels in the static test results from the Agate Creek waste rock samples range from 5 mg/L to 1760 mg/L with a low median value of 20 mg/L. Only one sample from Pit 2 is above the ANZECC and ARMCANZ (2000) Livestock Drinking Water Guideline of 1000 mg/L.

Sulphate values in the KLC tests were all within compliance levels. Based on these results the environmental risk from sulphate is considered low.

- **Metals and Metalloids:** In KLC tests, levels above compliance values were detected for aluminium, boron, copper and zinc. These exceedances were relatively low and were probably associated with adsorbed species on colloids being included in the “dissolved” analyses. As such, these exceedances are considered to display a very low to low environmental risk associated with the Agate Creek waste rock piles.

5.4 RECOMMENDATIONS

The overall risk associated with the Agate Creek waste rock material is most likely very low to possibly low. In the light of this level of risk, capping is not recommended or appropriate. Any waste rock piles developed by the mining activities should be covered with layers of sub-soil and top-soil and revegetated with a range of native plant and grass species appropriate to the soils and climate of the area.

Additionally, it is recommended that the site determine site-specific water quality objectives for the receiving environment of Agate Creek and the groundwaters of relevance to the site, with particular focus on fluoride, sulphate, aluminium, boron, copper and zinc. This will allow for appropriate monitoring of potential impacts from operations/activities associated with the proposed project.

6. REFERENCES

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CLIENT: WULGURU TECHNICAL SERVICES
PROJECT: AGATE CREEK GOLD MINE
REPORT: WASTE ROCK CHARACTERISATION
DATE: AUGUST 2022



Appendix A – Static Results

CERTIFICATE OF ANALYSIS

Work Order : **EB2203022**
Client : **C & R CONSULTING PTY LTD**
Contact : ALEXANDER BARNES
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : ----
Project : Agate Creek Geochemistry
Order number : ----
C-O-C number : ----
Sampler : PETER NEVILLE
Site : ----
Quote number : TV/178/21
No. of samples received : 56
No. of samples analysed : 56

Page : 1 of 26
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 01-Feb-2022 09:00
Date Analysis Commenced : 10-Feb-2022
Issue Date : 08-Mar-2022 16:57



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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.

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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EG005T (Total Metals by ICP-AES): V33205 (EB2203022-039) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V32485 (EB2203022-010) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V32512 (EB2203022-019) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- 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)				Sample ID	V32482	V32485	V32488	V32491	V32494
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-009	EB2203022-010	EB2203022-011	EB2203022-012	EB2203022-013
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.0	5.4	5.6	6.0	6.2
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	-0.5	-7.0	-6.8	-1.1
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		40	234	32	23	22
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.3	5.5	4.9	5.8	5.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.9	3.8	13.6	3.5	3.4
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	0.5	7.0	6.8	1.1
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	0.7	0.7	0.1
Fizz Rating	----	0	Fizz Unit		0	0	1	1	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	1.7	<1.0	1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	20	<10	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		20	330	40	100	110
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2420	1950	1470	1740	1680
Arsenic	7440-38-2	5	mg/kg		11	33	6	26	9
Barium	7440-39-3	10	mg/kg		20	240	40	40	70
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		8	6	16	9	8
Cobalt	7440-48-4	2	mg/kg		2	<2	<2	5	5
Copper	7440-50-8	5	mg/kg		7	7	9	17	14
Iron	7439-89-6	50	mg/kg		17800	5860	6030	12000	15700
Lead	7439-92-1	5	mg/kg		7	13	10	10	14



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V32482	V32485	V32488	V32491	V32494
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203022-009	EB2203022-010	EB2203022-011	EB2203022-012	EB2203022-013
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	33	<5	5	481	120
Nickel	7440-02-0	2	mg/kg	4	5	9	5	6
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	17	13	9	21	16
Zinc	7440-66-6	5	mg/kg	32	24	6	21	34
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	8	3	5	4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32497	V32500	V32503	V32506	V32509
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-014	EB2203022-015	EB2203022-016	EB2203022-017	EB2203022-018
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.9	7.0	7.1	7.2	7.3
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.6	-0.8	-0.8	-0.9	-1.2
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		36	13	20	22	47
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.8	6.0	5.9	6.3	7.0
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		3.6	2.5	3.2	1.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		0.6	0.8	0.8	0.9	1.2
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	<0.1	<0.1	0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	1.1	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		20	10	<10	10	30
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1700	1860	1420	2150	1390
Arsenic	7440-38-2	5	mg/kg		8	17	<5	<5	<5
Barium	7440-39-3	10	mg/kg		70	80	30	20	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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	11	9	12	14
Cobalt	7440-48-4	2	mg/kg		6	14	3	30	4
Copper	7440-50-8	5	mg/kg		10	23	14	19	9
Iron	7439-89-6	50	mg/kg		22400	18100	6650	32200	9560
Lead	7439-92-1	5	mg/kg		17	16	14	13	10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32497	V32500	V32503	V32506	V32509
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-014	EB2203022-015	EB2203022-016	EB2203022-017	EB2203022-018
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		62	312	84	376	191
Nickel	7440-02-0	2	mg/kg		11	14	8	25	10
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		11	9	<5	8	5
Zinc	7440-66-6	5	mg/kg		36	38	37	120	38
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		6	6	4	5	5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32512	V32515	V32518	V32521	V32524
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-019	EB2203022-020	EB2203022-021	EB2203022-022	EB2203022-023
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.4	7.6	7.4	7.3	7.2
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	-0.8	-6.7	-6.7	-1.1
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		28	30	35	30	47
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.9	6.5	6.4	6.9	8.0
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	1.6	1.2	0.2	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	0.8	6.7	6.7	1.1
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	0.7	0.7	0.1
Fizz Rating	----	0	Fizz Unit		0	0	1	1	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.0	1.0	1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	20	20	20	40
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1920	1240	1370	1450	1450
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		70	20	40	10	100
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		11	14	12	18	8
Cobalt	7440-48-4	2	mg/kg		10	4	3	2	<2
Copper	7440-50-8	5	mg/kg		9	11	<5	9	12
Iron	7439-89-6	50	mg/kg		27100	10900	9370	7860	8500
Lead	7439-92-1	5	mg/kg		6	8	20	11	10



Analytical Results

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

Sample ID

				V32512	V32515	V32518	V32521	V32524
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203022-019	EB2203022-020	EB2203022-021	EB2203022-022	EB2203022-023
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	456	161	104	219	128
Nickel	7440-02-0	2	mg/kg	19	13	10	10	10
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	6	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	72	38	34	35	39
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	4	3	3	4	4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32527	V32530	V32533	V32536	V32539
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-024	EB2203022-025	EB2203022-026	EB2203022-027	EB2203022-028
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.3	6.5	7.8	7.6	7.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-1.6	-1.0	-1.2	-0.7	-0.8
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		41	96	69	46	65
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		8.0	6.8	7.6	7.4	7.2
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	1.0	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.6	1.3	1.5	1.0	1.4
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.1	0.2	0.1	0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		10	110	90	40	70
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	0.01	0.01	0.01	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		20	120	10	10	20
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1240	1780	1190	3330	3170
Arsenic	7440-38-2	5	mg/kg		<5	21	5	<5	7
Barium	7440-39-3	10	mg/kg		130	290	50	50	80
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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	8	10	14	13
Cobalt	7440-48-4	2	mg/kg		6	45	18	7	7
Copper	7440-50-8	5	mg/kg		15	22	6	12	8
Iron	7439-89-6	50	mg/kg		8470	16400	9940	25600	26200
Lead	7439-92-1	5	mg/kg		11	18	19	9	17



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32527	V32530	V32533	V32536	V32539
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-024	EB2203022-025	EB2203022-026	EB2203022-027	EB2203022-028
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		325	52	562	515	738
Nickel	7440-02-0	2	mg/kg		10	43	18	14	12
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	5	6	14	11
Zinc	7440-66-6	5	mg/kg		42	185	83	94	63
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	0.3	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		5	3	4	4	4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32542	V33151	V33154	V33157	V33189
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-029	EB2203022-030	EB2203022-031	EB2203022-032	EB2203022-033
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.3	6.9	7.2	4.7	5.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.0	-0.6	<0.5	6.4	0.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		44	21	23	278	57
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.2	5.4	6.9	3.4	5.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	2.4	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	2.8	1.0	5.2	1.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		3.3	0.6	<0.5	0.6	<0.5
ANC as CaCO3	----	0.1	% CaCO3		0.3	<0.1	<0.1	<0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	1.5	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		30	<10	<10	670	110
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	0.23	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		10	<10	<10	100	30
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		5820	750	610	8800	2410
Arsenic	7440-38-2	5	mg/kg		<5	19	6	37	18
Barium	7440-39-3	10	mg/kg		40	<10	<10	<10	10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	1	<1
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		13	13	5	33	12
Cobalt	7440-48-4	2	mg/kg		7	2	<2	48	20
Copper	7440-50-8	5	mg/kg		10	25	25	155	48
Iron	7439-89-6	50	mg/kg		48100	6850	1010	46100	28500
Lead	7439-92-1	5	mg/kg		10	<5	<5	<5	9



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V32542	V33151	V33154	V33157	V33189
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203022-029	EB2203022-030	EB2203022-031	EB2203022-032	EB2203022-033
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	903	36	6	589	187
Nickel	7440-02-0	2	mg/kg	18	10	3	118	6
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	10	10	8	64	57
Zinc	7440-66-6	5	mg/kg	120	15	<5	215	16
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	4	5	8	2	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33192	V33195	V33198	V33201	V33202
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-034	EB2203022-035	EB2203022-036	EB2203022-037	EB2203022-038
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.3	5.7	6.7	7.0	5.4
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-5.3	-1.8	-5.6	-15.6	-8.3
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		242	334	429	446	296
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.2	7.2	6.9	7.2	7.1
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		5.3	<0.1	0.2	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		5.9	2.7	6.8	16.8	8.9
ANC as CaCO3	----	0.1	% CaCO3		0.6	0.3	0.7	1.7	0.9
Fizz Rating	----	0	Fizz Unit		1	0	0	1	1
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	1.0	1.7	2.9	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		420	630	820	910	530
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	0.03	0.04	0.04	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		90	130	180	160	120
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1190	1460	6370	14500	3050
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	13	18
Barium	7440-39-3	10	mg/kg		60	20	20	<10	20
Beryllium	7440-41-7	1	mg/kg		<1	1	<1	1	<1
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	7	16	32	20
Cobalt	7440-48-4	2	mg/kg		4	37	39	53	31
Copper	7440-50-8	5	mg/kg		38	68	142	125	44
Iron	7439-89-6	50	mg/kg		14400	38500	40900	71800	40900
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	10



Analytical Results

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

Sample ID

				V33192	V33195	V33198	V33201	V33202
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203022-034	EB2203022-035	EB2203022-036	EB2203022-037	EB2203022-038
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	29	1580	1070	4260	453
Nickel	7440-02-0	2	mg/kg	4	17	47	62	14
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	28	32	66	126	70
Zinc	7440-66-6	5	mg/kg	15	68	68	108	33
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	2	3	4	6	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33205	V33208	V33211	V33214	V33217
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-039	EB2203022-040	EB2203022-041	EB2203022-042	EB2203022-043
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.2	7.4	7.2	8.4	7.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-12.9	-8.9	-16.8	-9.3	-23.8
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		143	52	342	147	55
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		8.0	7.4	6.9	7.6	7.4
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	0.2	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		13.2	9.2	17.4	9.6	23.8
ANC as CaCO3	----	0.1	% CaCO3		1.3	0.9	1.8	1.0	2.4
Fizz Rating	----	0	Fizz Unit		1	1	1	1	1
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.0	<1.0	2.0	<1.0	2.6
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		110	60	580	170	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	0.01	0.02	0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		90	20	140	60	20
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2780	1140	27000	2470	22300
Arsenic	7440-38-2	5	mg/kg		<5	<5	9	11	<5
Barium	7440-39-3	10	mg/kg		80	20	<10	<10	20
Beryllium	7440-41-7	1	mg/kg		2	<1	<1	<1	2
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	28	31	13	26
Cobalt	7440-48-4	2	mg/kg		23	49	58	9	53
Copper	7440-50-8	5	mg/kg		73	56	60	9	80
Iron	7439-89-6	50	mg/kg		49000	9310	56000	6440	55400
Lead	7439-92-1	5	mg/kg		<5	<5	<5	21	9



Analytical Results

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

Sample ID

				V33205	V33208	V33211	V33214	V33217
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203022-039	EB2203022-040	EB2203022-041	EB2203022-042	EB2203022-043
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	2090	852	973	212	1560
Nickel	7440-02-0	2	mg/kg	12	31	162	20	135
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	50	14	111	9	106
Zinc	7440-66-6	5	mg/kg	59	24	114	17	121
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	18	8	12	11	20



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33220	V33223	V33226	V33246	V33249
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-044	EB2203022-045	EB2203022-046	EB2203022-047	EB2203022-048
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.4	7.2	7.2	5.6	7.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-26.0	-25.1	-28.0	-9.2	-4.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		58	51	46	42	221
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.8	7.4	7.4	6.3	7.5
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.8	<0.1	<0.1	0.9	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		27.8	25.1	28.0	9.2	4.8
ANC as CaCO3	----	0.1	% CaCO3		2.8	2.6	2.8	0.9	0.5
Fizz Rating	----	0	Fizz Unit		1	1	1	1	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.1	5.4	5.0	1.7	1.4
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		70	<10	<10	30	100
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.06	<0.01	<0.01	<0.01	0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		10	20	20	30	200
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		21800	27200	25400	5320	2570
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	6	<5
Barium	7440-39-3	10	mg/kg		10	60	30	80	510
Beryllium	7440-41-7	1	mg/kg		1	2	2	<1	1
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		26	27	30	9	8
Cobalt	7440-48-4	2	mg/kg		40	62	50	3	6
Copper	7440-50-8	5	mg/kg		51	109	120	5	6
Iron	7439-89-6	50	mg/kg		46500	57400	51100	14600	8610
Lead	7439-92-1	5	mg/kg		<5	<5	<5	7	7



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33220	V33223	V33226	V33246	V33249
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-044	EB2203022-045	EB2203022-046	EB2203022-047	EB2203022-048
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		2040	3200	1400	28	416
Nickel	7440-02-0	2	mg/kg		102	136	132	4	9
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		86	137	130	17	6
Zinc	7440-66-6	5	mg/kg		57	78	75	19	38
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		14	18	16	6	21



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33252	V33255	V33258	V33261	V33264
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-049	EB2203022-050	EB2203022-051	EB2203022-052	EB2203022-053
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.1	7.2	8.0	7.7	7.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.6	-2.9	-12.4	-8.2	-17.8
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		175	189	78	28	21
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.0	6.2	7.5	7.4	7.2
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		3.0	1.4	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.6	2.9	12.4	8.2	17.8
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.3	1.2	0.8	1.8
Fizz Rating	----	0	Fizz Unit		0	0	1	0	1
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.1	<1.0	1.1	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		120	140	40	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		140	150	60	20	10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1290	760	3840	6740	7000
Arsenic	7440-38-2	5	mg/kg		7	5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		190	30	90	60	40
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		7	17	11	21	21
Cobalt	7440-48-4	2	mg/kg		<2	<2	7	12	11
Copper	7440-50-8	5	mg/kg		8	8	19	12	8
Iron	7439-89-6	50	mg/kg		4170	2930	16700	19000	18200
Lead	7439-92-1	5	mg/kg		7	6	11	8	6



Analytical Results

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

Sample ID

				V33252	V33255	V33258	V33261	V33264
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203022-049	EB2203022-050	EB2203022-051	EB2203022-052	EB2203022-053
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	16	13	199	359	407
Nickel	7440-02-0	2	mg/kg	6	12	17	18	18
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	<5	9	19	19
Zinc	7440-66-6	5	mg/kg	15	12	72	64	59
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	13	8	11	7	4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33327	V33330	V33333	V33336	V33339
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-054	EB2203022-055	EB2203022-056	EB2203022-057	EB2203022-058
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.2	7.4	7.5	6.8	7.4
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-5.5	-16.4	-9.5	-5.2	-3.0
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		19	100	133	256	58
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.7	7.5	7.1	7.1	7.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.8	<0.1	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		5.8	16.4	9.5	5.5	3.0
ANC as CaCO3	----	0.1	% CaCO3		0.6	1.7	1.0	0.6	0.3
Fizz Rating	----	0	Fizz Unit		0	1	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	1.0	<1.0	1.1	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		10	60	130	280	40
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		10	60	100	170	40
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		6940	6440	7330	6200	1580
Arsenic	7440-38-2	5	mg/kg		6	7	6	<5	8
Barium	7440-39-3	10	mg/kg		90	90	40	160	90
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		13	10	20	10	11
Cobalt	7440-48-4	2	mg/kg		10	10	12	14	5
Copper	7440-50-8	5	mg/kg		<5	6	10	14	10
Iron	7439-89-6	50	mg/kg		20200	16000	22300	18800	5040
Lead	7439-92-1	5	mg/kg		10	11	10	7	12



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33327	V33330	V33333	V33336	V33339
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-054	EB2203022-055	EB2203022-056	EB2203022-057	EB2203022-058
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		158	857	287	111	219
Nickel	7440-02-0	2	mg/kg		13	12	19	23	10
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		24	15	28	16	7
Zinc	7440-66-6	5	mg/kg		48	36	64	129	38
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		2	24	9	9	8



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33342	V33345	V33348	V33351	V33354
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203022-059	EB2203022-060	EB2203022-061	EB2203022-062	EB2203022-063
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.9	6.8	8.0	7.4	7.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	-11.8	-8.3	-13.7	-7.1
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		22	20	46	40	45
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.2	7.5	7.3	7.2	6.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	0.9
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	11.8	8.3	13.7	7.1
ANC as CaCO3	----	0.1	% CaCO3		<0.1	1.2	0.8	1.4	0.7
Fizz Rating	----	0	Fizz Unit		0	1	0	1	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		10	<10	10	40	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2360	2530	8260	5420	9800
Arsenic	7440-38-2	5	mg/kg		10	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		80	60	60	20	50
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	1
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		7	6	11	10	14
Cobalt	7440-48-4	2	mg/kg		6	7	22	6	8
Copper	7440-50-8	5	mg/kg		11	9	14	12	17
Iron	7439-89-6	50	mg/kg		7770	7810	27400	18500	26500
Lead	7439-92-1	5	mg/kg		8	9	10	10	13



Analytical Results

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

Sample ID

				V33342	V33345	V33348	V33351	V33354
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203022-059	EB2203022-060	EB2203022-061	EB2203022-062	EB2203022-063
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	180	138	278	240	63
Nickel	7440-02-0	2	mg/kg	11	8	45	10	12
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	6	7	14	12	15
Zinc	7440-66-6	5	mg/kg	52	39	122	51	73
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	4	4	4	4	4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Sample ID		V33357	----	----	----	----
		Sampling date / time		01-Feb-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2203022-064	-----	-----	-----	-----
Result				----	----	----	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	8.0	----	----	----	----
EA009: Net Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-1.0	----	----	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	80	----	----	----	----
EA011: Net Acid Generation								
pH (OX)	----	0.1	pH Unit	3.4	----	----	----	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t	4.0	----	----	----	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t	6.3	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	8.3	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	0.8	----	----	----	----
Fizz Rating	----	0	Fizz Unit	0	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	<1.0	----	----	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	110	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.24	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	<10	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	8370	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	7	----	----	----	----
Barium	7440-39-3	10	mg/kg	160	----	----	----	----
Beryllium	7440-41-7	1	mg/kg	<1	----	----	----	----
Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	20	----	----	----	----
Cobalt	7440-48-4	2	mg/kg	13	----	----	----	----
Copper	7440-50-8	5	mg/kg	9	----	----	----	----
Iron	7439-89-6	50	mg/kg	29600	----	----	----	----
Lead	7439-92-1	5	mg/kg	11	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33357	----	----	----	----
				Sampling date / time	01-Feb-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2203022-064	-----	-----	-----	-----
				Result		----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		401	----	----	----	----
Nickel	7440-02-0	2	mg/kg		17	----	----	----	----
Selenium	7782-49-2	5	mg/kg		<5	----	----	----	----
Vanadium	7440-62-2	5	mg/kg		25	----	----	----	----
Zinc	7440-66-6	5	mg/kg		55	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		2	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: EB2203026	Page	: 1 of 4
Amendment	: 1		
Client	: C & R CONSULTING PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: ALEXANDER BARNES	Contact	: Princess Marcelo
Address	: 188 ROSS RIVER ROAD	Address	: 2 Byth Street Stafford QLD Australia 4053
	AITKENVALE QUEENSLAND 4812		
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Agate Creek Geochemistry	Date Samples Received	: 01-Feb-2022 09:00
Order number	: ----	Date Analysis Commenced	: 15-Feb-2022
C-O-C number	: ----	Issue Date	: 10-Mar-2022 15:27
Sampler	: PETER NEVILLE		
Site	: ----		
Quote number	: TV/178/21		
No. of samples received	: 1		
No. of samples analysed	: 1		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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.

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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Amendment (10/3/22): This report has been amended and re-released to allow the reporting of additional analytical data, specifically Thorium that was missed at the log-in stage.
- 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)			Sample ID	V34048 to V34117 Composite	----	----	----	----
			Sampling date / time	01-Feb-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2203026-001	-----	-----	-----	-----
				Result	----	----	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	5.3	----	----	----	----
EA009: Net Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	-3.3	----	----	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	19	----	----	----	----
EA011: Net Acid Generation								
pH (OX)	----	0.1	pH Unit	7.1	----	----	----	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t	<0.1	----	----	----	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t	<0.1	----	----	----	----
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	3.3	----	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	0.3	----	----	----	----
Fizz Rating	----	0	Fizz Unit	0	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	<1.0	----	----	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	----	----	----	----
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	20	----	----	----	----
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	<10	----	----	----	----
Magnesium	7439-95-4	10	mg/kg	<10	----	----	----	----
Sodium	7440-23-5	10	mg/kg	<10	----	----	----	----
Potassium	7440-09-7	10	mg/kg	20	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Aluminium	7429-90-5	50	mg/kg	710	----	----	----	----
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Barium	7440-39-3	10	mg/kg	<10	----	----	----	----
Beryllium	7440-41-7	1	mg/kg	<1	----	----	----	----
Boron	7440-42-8	50	mg/kg	<50	----	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V34048 to V34117 Composite	----	----	----	----
Sampling date / time				01-Feb-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2203026-001	-----	-----	-----	-----
Result					----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	5	----	----	----	----
Cobalt	7440-48-4	2	mg/kg	<2	----	----	----	----
Copper	7440-50-8	5	mg/kg	<5	----	----	----	----
Iron	7439-89-6	50	mg/kg	5180	----	----	----	----
Lead	7439-92-1	5	mg/kg	<5	----	----	----	----
Manganese	7439-96-5	5	mg/kg	78	----	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	----	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
Vanadium	7440-62-2	5	mg/kg	6	----	----	----	----
Zinc	7440-66-6	5	mg/kg	14	----	----	----	----
EG020T: Total Metals by ICP-MS								
Thorium	7440-29-1	0.1	mg/kg	0.8	----	----	----	----
Molybdenum	7439-98-7	0.1	mg/kg	2.4	----	----	----	----
Antimony	7440-36-0	0.1	mg/kg	0.5	----	----	----	----
Uranium	7440-61-1	0.1	mg/kg	0.4	----	----	----	----
Tellurium	22541-49-7	0.5	mg/kg	<0.5	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2203029**
Client : **C & R CONSULTING PTY LTD**
Contact : ALEXANDER BARNES
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : ----
Project : Agate Creek Geochemistry
Order number : ----
C-O-C number : ----
Sampler : PETER NEVILLE
Site : ----
Quote number : TV/178/21
No. of samples received : 73
No. of samples analysed : 73

Page : 1 of 32
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 01-Feb-2022 09:00
Date Analysis Commenced : 10-Feb-2022
Issue Date : 10-Mar-2022 15:31



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

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- Analytical Results

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- **SPLIT WORK ORDER:** It should be noted that ALS has split this work order over the following work orders (EB2203032, EB2203029) due to the size of the sample numbers. For any further information regarding this processing of samples please contact ALS client services division on ALSEnviro.Brisbane@alsglobal.com
- EG005T (Total Metals by ICP-AES): V33031 (EB2203029-046) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V31908 (EB2203029-005) and V320030 (EB2203029-015) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- 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)				Sample ID	V31900	V31903	V31905	V31906	V31908
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-001	EB2203029-002	EB2203029-003	EB2203029-004	EB2203029-005
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.9	5.0	5.0	5.0	4.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.7	-1.1	-0.7	-2.0	-1.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		10	10	13	10	13
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.6	5.6	5.5	5.8	5.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		4.4	6.1	4.2	3.3	4.4
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		0.7	1.1	0.7	2.0	1.6
ANC as CaCO3	----	0.1	% CaCO3		<0.1	0.1	<0.1	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1000	980	1300	740	920
Arsenic	7440-38-2	5	mg/kg		<5	6	13	<5	<5
Barium	7440-39-3	10	mg/kg		10	10	10	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		5	2	3	<2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	8	<5	<5
Iron	7439-89-6	50	mg/kg		2240	4760	10700	2000	810
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V31900	V31903	V31905	V31906	V31908
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-001	EB2203029-002	EB2203029-003	EB2203029-004	EB2203029-005
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		<5	<5	6	5	<5
Nickel	7440-02-0	2	mg/kg		3	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		10	6	6	<5	<5
Zinc	7440-66-6	5	mg/kg		<5	<5	8	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V31910	V31912	V31914	V31916	V31918
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-006	EB2203029-007	EB2203029-008	EB2203029-009	EB2203029-010
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.2	5.4	5.5	5.4	5.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	-1.6	-1.9	-2.4	-2.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		10	10	11	13	15
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.8	5.6	5.9	6.6	6.1
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		3.6	4.2	2.7	0.8	2.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	1.6	1.9	2.4	2.5
ANC as CaCO3	----	0.1	% CaCO3		<0.1	0.2	0.2	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	1.0	1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	10	10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1000	790	1080	1010	760
Arsenic	7440-38-2	5	mg/kg		<5	<5	5	8	9
Barium	7440-39-3	10	mg/kg		10	20	40	60	10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		<2	2	3	2	<2
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	6	7	13
Iron	7439-89-6	50	mg/kg		380	4920	5820	5600	3400
Lead	7439-92-1	5	mg/kg		<5	<5	7	10	6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V31910	V31912	V31914	V31916	V31918
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-006	EB2203029-007	EB2203029-008	EB2203029-009	EB2203029-010
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		<5	<5	20	93	39
Nickel	7440-02-0	2	mg/kg		<2	<2	2	3	2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	6	7	8	<5
Zinc	7440-66-6	5	mg/kg		<5	<5	10	11	14
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		<1	1	1	2	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V31920	V31922	V31997	V32000	V32003
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-011	EB2203029-012	EB2203029-013	EB2203029-014	EB2203029-015
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.8	5.8	5.5	5.8	6.2
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	-3.0	-1.0	-1.7	-2.9
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		15	26	16	23	29
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.1	7.1	6.1	6.4	7.6
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		3.4	<0.1	1.5	1.3	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	3.0	1.0	1.7	2.9
ANC as CaCO3	----	0.1	% CaCO3		<0.1	0.3	<0.1	0.2	0.3
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.2	1.4	<1.0	<1.0	1.1
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	10	20	10	10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	230	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		980	990	410	620	990
Arsenic	7440-38-2	5	mg/kg		14	11	19	<5	11
Barium	7440-39-3	10	mg/kg		40	10	40	20	80
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		2	<2	5	8	5
Cobalt	7440-48-4	2	mg/kg		3	6	<2	<2	8
Copper	7440-50-8	5	mg/kg		11	9	12	<5	9
Iron	7439-89-6	50	mg/kg		9380	14700	4630	2510	13800
Lead	7439-92-1	5	mg/kg		8	5	<5	<5	7



Analytical Results

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

Sample ID

				V31920	V31922	V31997	V32000	V32003
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-011	EB2203029-012	EB2203029-013	EB2203029-014	EB2203029-015
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	188	66	23	22	307
Nickel	7440-02-0	2	mg/kg	4	5	4	4	8
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	5	6	8	<5	<5
Zinc	7440-66-6	5	mg/kg	18	25	10	<5	29
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	3	4	1	3	6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32006	V32009	V32012	V32015	V32018
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-016	EB2203029-017	EB2203029-018	EB2203029-019	EB2203029-020
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.4	6.8	6.8	6.9	7.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-1.5	-3.4	-3.7	-2.0	10.7
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		33	29	25	30	112
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.2	6.5	7.8	6.5	2.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	9.9
NAG (pH 7.0)	----	0.1	kg H2SO4/t		3.3	1.6	<0.1	1.2	12.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.8	3.4	3.7	2.0	5.2
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.4	0.4	0.2	0.5
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.3	1.1	1.1	1.4	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		30	<10	<10	10	190
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	<0.01	0.52
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1200	900	1320	1020	4250
Arsenic	7440-38-2	5	mg/kg		14	7	27	15	59
Barium	7440-39-3	10	mg/kg		210	40	70	20	10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		4	5	6	4	7
Cobalt	7440-48-4	2	mg/kg		3	<2	7	4	15
Copper	7440-50-8	5	mg/kg		7	<5	12	6	12
Iron	7439-89-6	50	mg/kg		4940	7590	17700	11700	22900
Lead	7439-92-1	5	mg/kg		9	8	14	6	8



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V32006	V32009	V32012	V32015	V32018
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-016	EB2203029-017	EB2203029-018	EB2203029-019	EB2203029-020
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	54	77	462	103	506
Nickel	7440-02-0	2	mg/kg	7	6	7	8	29
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	<5	5	<5	11
Zinc	7440-66-6	5	mg/kg	34	22	26	27	126
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	7	8	8	9	7



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32021	V32024	V32027	V32137	V32140
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-021	EB2203029-022	EB2203029-023	EB2203029-024	EB2203029-025
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.9	7.6	7.7	4.8	5.4
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.1	-5.5	-2.2	-1.7	-2.7
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		67	63	59	39	276
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.4	7.3	6.0	5.8	5.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	1.2	1.3	1.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		3.4	5.5	2.2	1.7	2.7
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.6	0.2	0.2	0.3
Fizz Rating	----	0	Fizz Unit		0	1	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	1.6
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		30	30	30	30	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	20	310
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1560	1000	1060	2360	1800
Arsenic	7440-38-2	5	mg/kg		<5	<5	9	10	11
Barium	7440-39-3	10	mg/kg		40	20	40	30	120
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		4	3	2	6	11
Cobalt	7440-48-4	2	mg/kg		7	6	4	<2	3
Copper	7440-50-8	5	mg/kg		6	<5	12	<5	9
Iron	7439-89-6	50	mg/kg		22000	26400	18100	13200	11000
Lead	7439-92-1	5	mg/kg		8	5	8	<5	5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32021	V32024	V32027	V32137	V32140
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-021	EB2203029-022	EB2203029-023	EB2203029-024	EB2203029-025
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		365	428	382	19	25
Nickel	7440-02-0	2	mg/kg		11	6	7	3	8
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		7	7	6	17	12
Zinc	7440-66-6	5	mg/kg		78	61	46	14	21
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		12	10	10	<1	11



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32143	V32146	V32149	V32152	V32155
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-026	EB2203029-027	EB2203029-028	EB2203029-029	EB2203029-030
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.0	5.3	6.0	6.7	7.2
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.2	-2.3	-2.9	-3.4	-3.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		270	279	186	162	180
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.9	6.0	6.8	6.3	7.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		2.0	1.9	0.9	2.3	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.2	2.3	2.9	3.4	3.6
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.3	0.4	0.4
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.6	1.5	<1.0	1.1	1.1
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		50	40	20	30	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		370	350	210	140	200
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1830	1410	1220	1460	1200
Arsenic	7440-38-2	5	mg/kg		29	14	8	12	7
Barium	7440-39-3	10	mg/kg		70	30	20	130	20
Beryllium	7440-41-7	1	mg/kg		1	<1	<1	<1	<1
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	21	17	17	19
Cobalt	7440-48-4	2	mg/kg		4	3	4	8	4
Copper	7440-50-8	5	mg/kg		9	8	8	11	8
Iron	7439-89-6	50	mg/kg		20500	5580	6080	10200	8550
Lead	7439-92-1	5	mg/kg		8	6	10	13	12



Analytical Results

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

Sample ID

				V32143	V32146	V32149	V32152	V32155
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-026	EB2203029-027	EB2203029-028	EB2203029-029	EB2203029-030
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	14	9	85	63	162
Nickel	7440-02-0	2	mg/kg	11	14	12	21	15
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	9	10	7	7	6
Zinc	7440-66-6	5	mg/kg	35	21	16	64	17
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	2	3	7	18	7



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32158	V32161	V32164	V32167	V32967
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-031	EB2203029-032	EB2203029-033	EB2203029-034	EB2203029-035
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.6	7.1	7.2	7.2	5.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.8	-3.9	-2.9	-4.5	-2.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		130	198	129	157	64
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.8	7.5	7.7	7.8	7.0
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.8	3.9	2.9	4.5	2.9
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.4	0.3	0.4	0.3
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.4	1.3	<1.0	1.1	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		30	40	40	40	90
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		110	210	110	160	20
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1110	1230	1300	3060	3170
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	6
Barium	7440-39-3	10	mg/kg		20	20	100	20	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		15	14	11	12	20
Cobalt	7440-48-4	2	mg/kg		4	5	10	18	29
Copper	7440-50-8	5	mg/kg		7	7	12	12	70
Iron	7439-89-6	50	mg/kg		17400	45200	33500	47900	31900
Lead	7439-92-1	5	mg/kg		13	15	15	11	28



Analytical Results

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

Sample ID

				V32158	V32161	V32164	V32167	V32967
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-031	EB2203029-032	EB2203029-033	EB2203029-034	EB2203029-035
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	217	814	1100	451	405
Nickel	7440-02-0	2	mg/kg	13	11	11	24	17
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	6	9	11	8	53
Zinc	7440-66-6	5	mg/kg	28	46	40	140	47
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	7	6	6	7	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32970	V32973	V32976	V32979	V32982
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-036	EB2203029-037	EB2203029-038	EB2203029-039	EB2203029-040
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.1	4.8	4.7	4.6	5.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.2	-1.0	-0.6	-0.9	-1.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		64	170	287	362	256
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.1	6.0	6.3	6.2	6.3
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		5.3	3.2	2.4	1.0	1.0
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		0.8	2.2	3.0	2.1	2.3
ANC as CaCO3	----	0.1	% CaCO3		<0.1	0.2	0.3	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		70	250	490	640	460
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	0.04	0.08	0.04	0.03
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		40	60	60	70	40
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1070	1000	1210	1510	1130
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	13
Barium	7440-39-3	10	mg/kg		30	<10	<10	<10	10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	1	1
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		10	10	9	13	10
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	4	<2
Copper	7440-50-8	5	mg/kg		8	11	19	66	62
Iron	7439-89-6	50	mg/kg		29100	15700	16600	44500	31100
Lead	7439-92-1	5	mg/kg		<5	<5	<5	34	24



Analytical Results

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

Sample ID

				V32970	V32973	V32976	V32979	V32982
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-036	EB2203029-037	EB2203029-038	EB2203029-039	EB2203029-040
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	<5	<5	<5	27	6
Nickel	7440-02-0	2	mg/kg	3	5	3	6	4
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	11	13	21	83	34
Zinc	7440-66-6	5	mg/kg	<5	7	5	24	12
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V32985	V32988	V32991	V33025	V33028
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-041	EB2203029-042	EB2203029-043	EB2203029-044	EB2203029-045
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.4	6.2	6.2	5.0	4.5
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-1.7	-0.7	-0.4	-1.8	1.2
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		233	82	168	60	394
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.6	6.1	5.8	5.2	5.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		4.4	3.3	5.7	2.6	1.4
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.6	1.0	1.0	2.1	<0.5
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.1	<0.1	0.2	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	1.6
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		410	120	300	10	440
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.03	0.01	0.02	0.01	0.04
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		30	20	20	60	230
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1380	880	840	1400	1470
Arsenic	7440-38-2	5	mg/kg		22	18	26	<5	<5
Barium	7440-39-3	10	mg/kg		10	<10	<10	10	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		14	12	9	7	9
Cobalt	7440-48-4	2	mg/kg		<2	<2	2	2	8
Copper	7440-50-8	5	mg/kg		38	29	123	13	23
Iron	7439-89-6	50	mg/kg		31500	31600	23500	15600	33100
Lead	7439-92-1	5	mg/kg		14	10	31	<5	<5



Analytical Results

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

Sample ID

				V32985	V32988	V32991	V33025	V33028
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-041	EB2203029-042	EB2203029-043	EB2203029-044	EB2203029-045
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	12	25	77	25	230
Nickel	7440-02-0	2	mg/kg	6	6	7	2	7
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	104	10	10	15	32
Zinc	7440-66-6	5	mg/kg	16	10	24	7	27
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	3	3	4	<1	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33031	V33034	V33037	V33040	V33043
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-046	EB2203029-047	EB2203029-048	EB2203029-049	EB2203029-050
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.6	5.4	6.7	7.4	7.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.7	0.6	-12.2	-16.6	-8.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		347	158	194	286	177
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.3	5.8	7.1	7.2	7.2
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		2.2	4.2	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.6	<0.5	12.8	17.2	9.2
ANC as CaCO3	----	0.1	% CaCO3		0.2	<0.1	1.3	1.8	0.9
Fizz Rating	----	0	Fizz Unit		0	0	1	1	1
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.0	<1.0	1.4	2.7	2.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		390	190	280	420	300
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.03	0.02	0.02	0.02	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		200	90	70	90	40
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2180	3170	11600	41000	32400
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		60	<10	10	10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	1	2	2
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		16	13	17	71	90
Cobalt	7440-48-4	2	mg/kg		10	17	67	182	85
Copper	7440-50-8	5	mg/kg		35	26	27	74	75
Iron	7439-89-6	50	mg/kg		28900	27700	36700	94500	68200
Lead	7439-92-1	5	mg/kg		7	<5	<5	15	8



Analytical Results

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

Sample ID

				V33031	V33034	V33037	V33040	V33043
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-046	EB2203029-047	EB2203029-048	EB2203029-049	EB2203029-050
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	186	97	218	871	741
Nickel	7440-02-0	2	mg/kg	8	25	55	101	68
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	32	17	29	176	151
Zinc	7440-66-6	5	mg/kg	37	63	129	216	165
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	1	7	9	6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33046	V33049	V33052	V33055	V33133
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-051	EB2203029-052	EB2203029-053	EB2203029-054	EB2203029-055
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.5	7.4	7.3	7.3	5.3
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-18.0	-15.7	-15.5	-19.3	2.8
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		238	200	190	157	169
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.2	7.5	7.5	6.9	4.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	0.2	2.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		18.6	16.0	16.1	19.6	0.6
ANC as CaCO3	----	0.1	% CaCO3		1.9	1.6	1.6	2.0	<0.1
Fizz Rating	----	0	Fizz Unit		1	1	1	1	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		2.3	1.8	2.2	3.0	1.6
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		390	350	340	250	320
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	0.01	0.02	0.01	0.11
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		40	30	20	20	30
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		34900	28700	29500	38000	5080
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	60
Barium	7440-39-3	10	mg/kg		<10	10	20	10	40
Beryllium	7440-41-7	1	mg/kg		2	2	2	2	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	2	<1
Chromium	7440-47-3	2	mg/kg		27	38	28	60	26
Cobalt	7440-48-4	2	mg/kg		107	118	100	82	33
Copper	7440-50-8	5	mg/kg		96	100	99	134	71
Iron	7439-89-6	50	mg/kg		95800	91500	94100	107000	44400
Lead	7439-92-1	5	mg/kg		11	12	26	94	16



Analytical Results

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

Sample ID

				V33046	V33049	V33052	V33055	V33133
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-051	EB2203029-052	EB2203029-053	EB2203029-054	EB2203029-055
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	785	1490	1150	1170	632
Nickel	7440-02-0	2	mg/kg	75	92	70	102	31
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	198	165	181	240	91
Zinc	7440-66-6	5	mg/kg	187	234	317	395	55
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	8	8	9	20	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33136	V33139	V33142	V33145	V33148
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-056	EB2203029-057	EB2203029-058	EB2203029-059	EB2203029-060
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.5	7.5	7.8	8.0	7.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-19.8	-16.8	-16.8	-12.2	-5.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		177	1680	236	114	59
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.5	7.2	7.2	7.2	7.7
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		20.4	19.2	18.0	12.5	5.4
ANC as CaCO3	----	0.1	% CaCO3		2.1	2.0	1.8	1.3	0.5
Fizz Rating	----	0	Fizz Unit		1	1	1	1	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		8.4	6.6	3.2	2.5	1.5
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		130	1780	210	50	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	0.08	0.04	0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		120	750	120	30	10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		24200	25300	24800	18700	2320
Arsenic	7440-38-2	5	mg/kg		7	8	50	8	44
Barium	7440-39-3	10	mg/kg		290	280	270	270	90
Beryllium	7440-41-7	1	mg/kg		3	6	6	6	3
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	33	28	23	11
Cobalt	7440-48-4	2	mg/kg		63	89	91	190	24
Copper	7440-50-8	5	mg/kg		99	129	74	89	246
Iron	7439-89-6	50	mg/kg		60700	72400	65400	69500	50600
Lead	7439-92-1	5	mg/kg		6	5	7	<5	<5



Analytical Results

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

				Sample ID	V33136	V33139	V33142	V33145	V33148
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-056	EB2203029-057	EB2203029-058	EB2203029-059	EB2203029-060
				Result	Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		2710	2360	2830	3300	638
Nickel	7440-02-0	2	mg/kg		145	164	169	291	25
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		148	139	118	78	50
Zinc	7440-66-6	5	mg/kg		80	138	158	369	100
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		14	18	29	38	19



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33833	V33836	V33839	V33842	V33845
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-062	EB2203029-063	EB2203029-064	EB2203029-065	EB2203029-066
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.2	5.6	5.4	5.5	5.2
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.7	-2.8	-3.1	<0.5	-1.9
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		23	16	12	12	45
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.1	6.5	6.4	6.3	6.3
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.7	1.1	1.0	1.2	2.7
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.7	2.8	3.1	<0.5	1.9
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.3	0.3	<0.1	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	<10	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		30	20	10	<10	40
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		950	860	380	1270	810
Arsenic	7440-38-2	5	mg/kg		<5	8	<5	<5	<5
Barium	7440-39-3	10	mg/kg		<10	<10	<10	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		4	10	10	5	10
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		800	2130	1660	1150	1710
Lead	7439-92-1	5	mg/kg		<5	<5	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33833	V33836	V33839	V33842	V33845
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-062	EB2203029-063	EB2203029-064	EB2203029-065	EB2203029-066
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		<5	6	5	<5	5
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg		<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V33848	V34601	V34604	V34607	V34610
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203029-067	EB2203029-068	EB2203029-069	EB2203029-070	EB2203029-071
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.6	7.9	7.4	8.4	7.4
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.4	-12.0	-14.4	-6.2	-4.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		18	174	278	166	48
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.1	7.5	7.3	7.6	7.2
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.2	<0.1	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.4	12.0	14.7	6.2	4.4
ANC as CaCO3	----	0.1	% CaCO3		0.2	1.2	1.5	0.6	0.4
Fizz Rating	----	0	Fizz Unit		0	1	1	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	3.0	3.7	1.8	1.3
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		10	50	180	80	10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		20	130	210	160	20
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1060	19400	26300	2560	1480
Arsenic	7440-38-2	5	mg/kg		<5	31	16	<5	9
Barium	7440-39-3	10	mg/kg		<10	70	20	150	40
Beryllium	7440-41-7	1	mg/kg		<1	1	<1	<1	<1
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		7	41	50	16	17
Cobalt	7440-48-4	2	mg/kg		<2	88	73	32	15
Copper	7440-50-8	5	mg/kg		<5	108	84	140	102
Iron	7439-89-6	50	mg/kg		1370	53500	68500	29900	30700
Lead	7439-92-1	5	mg/kg		<5	11	9	6	7



Analytical Results

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

Sample ID

				V33848	V34601	V34604	V34607	V34610
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203029-067	EB2203029-068	EB2203029-069	EB2203029-070	EB2203029-071
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	<5	2010	1250	2130	873
Nickel	7440-02-0	2	mg/kg	<2	184	189	47	23
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	6	129	170	62	74
Zinc	7440-66-6	5	mg/kg	<5	90	165	119	54
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	62	59	40	17



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34613	V34616	V34618	----	----
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2203029-072	EB2203029-073	EB2203029-074	-----	-----
				Result	Result	Result	Result	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.4	7.2	7.2	----	----
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-0.5	-4.5	-3.9	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		36	34	24	----	----
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.7	6.6	7.6	----	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	----	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.3	1.0	<0.1	----	----
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		0.5	4.5	3.9	----	----
ANC as CaCO3	----	0.1	% CaCO3		<0.1	0.4	0.4	----	----
Fizz Rating	----	0	Fizz Unit		0	0	0	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		10	10	<10	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		870	2370	920	----	----
Arsenic	7440-38-2	5	mg/kg		12	9	7	----	----
Barium	7440-39-3	10	mg/kg		10	10	150	----	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	----	----
Boron	7440-42-8	50	mg/kg		<50	<50	<50	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		6	8	15	----	----
Cobalt	7440-48-4	2	mg/kg		3	7	54	----	----
Copper	7440-50-8	5	mg/kg		29	23	68	----	----
Iron	7439-89-6	50	mg/kg		2260	9050	4520	----	----
Lead	7439-92-1	5	mg/kg		8	<5	<5	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34613	V34616	V34618	----	----
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2203029-072	EB2203029-073	EB2203029-074	-----	-----
				Result	Result	Result	Result	----	----
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		39	182	1170	----	----
Nickel	7440-02-0	2	mg/kg		4	17	27	----	----
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	----	----
Vanadium	7440-62-2	5	mg/kg		24	23	13	----	----
Zinc	7440-66-6	5	mg/kg		5	19	14	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	----
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		12	20	11	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2203032**
Client : **C & R CONSULTING PTY LTD**
Contact : ALEXANDER BARNES
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : ----
Project : Agate Creek Geochemistry
Order number : ----
C-O-C number : ----
Sampler : PETER NEVILLE
Site : ----
Quote number : TV/178/21
No. of samples received : 40
No. of samples analysed : 40

Page : 1 of 18
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 01-Feb-2022 09:00
Date Analysis Commenced : 10-Feb-2022
Issue Date : 08-Mar-2022 16:47



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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.

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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- **SPLIT WORK ORDER:** It should be noted that ALS has split this work order over the following work orders (EB2203032, EB2203029) due to the size of the sample numbers. For any further information regarding this processing of samples please contact ALS client services division on ALSEnviro.Brisbane@alsglobal.com
- EG005T (Total Metals by ICP-AES): V34637 (EB2203032-001) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V34640 (EB2203032-002) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V34708 (EB2203032-021) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V34712 (EB2203032-023) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V34664 (EB2203032-011) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- 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)				Sample ID	V34637	V34640	V34643	V34646	V34649
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-001	EB2203032-002	EB2203032-003	EB2203032-004	EB2203032-005
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.7	7.5	8.0	7.1	6.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.8	-21.1	<0.5	<0.5	<0.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		23	82	85	27	7
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.8	7.1	7.6	6.5	6.1
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.7	<0.1	<0.1	1.3	3.7
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.8	21.1	<0.5	<0.5	<0.5
ANC as CaCO3	----	0.1	% CaCO3		0.3	2.2	<0.1	<0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	1	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		3.5	3.4	1.5	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	10	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		10	30	40	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		18200	22600	1900	1200	410
Arsenic	7440-38-2	5	mg/kg		16	24	<5	23	<5
Barium	7440-39-3	10	mg/kg		200	70	60	20	20
Beryllium	7440-41-7	1	mg/kg		2	1	1	<1	<1
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		48	46	16	6	<2
Cobalt	7440-48-4	2	mg/kg		44	44	17	3	3
Copper	7440-50-8	5	mg/kg		100	80	90	49	8
Iron	7439-89-6	50	mg/kg		49000	51800	40600	13600	1490
Lead	7439-92-1	5	mg/kg		9	10	11	<5	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34637	V34640	V34643	V34646	V34649
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-001	EB2203032-002	EB2203032-003	EB2203032-004	EB2203032-005
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		951	499	853	105	228
Nickel	7440-02-0	2	mg/kg		90	116	24	5	4
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		147	125	52	22	<5
Zinc	7440-66-6	5	mg/kg		96	111	92	14	7
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		3	46	36	10	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34652	V34654	V34655	V34658	V34661
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-006	EB2203032-007	EB2203032-008	EB2203032-009	EB2203032-010
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.2	7.4	5.8	8.5	5.5
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	<0.5	<0.5	-1.2	<0.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		14	14	10	91	14
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.4	7.0	6.8	7.9	5.2
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	0.6	<0.1	4.0
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	<0.5	<0.5	1.2	<0.5
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	<0.1	0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	2.3	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	10	70	20
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		600	840	4050	4460	870
Arsenic	7440-38-2	5	mg/kg		13	10	17	41	11
Barium	7440-39-3	10	mg/kg		20	10	70	70	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	1	1	<1
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		<2	<2	37	10	3
Cobalt	7440-48-4	2	mg/kg		6	4	41	28	<2
Copper	7440-50-8	5	mg/kg		10	18	50	145	14
Iron	7439-89-6	50	mg/kg		2160	1800	47600	13800	3340
Lead	7439-92-1	5	mg/kg		6	33	6	5	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V34652	V34654	V34655	V34658	V34661
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203032-006	EB2203032-007	EB2203032-008	EB2203032-009	EB2203032-010
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	266	202	1680	435	22
Nickel	7440-02-0	2	mg/kg	8	6	46	56	4
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	<5	85	46	14
Zinc	7440-66-6	5	mg/kg	12	12	21	75	5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	4	5	<1	19	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34664	V34667	V34670	V34672	V34691
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-011	EB2203032-012	EB2203032-013	EB2203032-014	EB2203032-015
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.8	7.2	7.2	7.2	6.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	<0.5	<0.5	<0.5	-3.0
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		21	13	19	11	83
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.3	7.1	6.0	6.6	6.6
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	3.0	0.8	0.8
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	<0.5	<0.5	<0.5	4.2
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	<0.1	<0.1	0.4
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	2.5
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	<10	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	0.04
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1100	550	680	620	15100
Arsenic	7440-38-2	5	mg/kg		11	13	8	5	23
Barium	7440-39-3	10	mg/kg		30	20	<10	<10	360
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	3
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		4	<2	<2	<2	64
Cobalt	7440-48-4	2	mg/kg		6	7	<2	4	174
Copper	7440-50-8	5	mg/kg		27	14	6	<5	220
Iron	7439-89-6	50	mg/kg		2610	1590	940	1830	48400
Lead	7439-92-1	5	mg/kg		9	15	10	8	6



Analytical Results

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

Sample ID

				V34664	V34667	V34670	V34672	V34691
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203032-011	EB2203032-012	EB2203032-013	EB2203032-014	EB2203032-015
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	226	194	23	78	1820
Nickel	7440-02-0	2	mg/kg	5	4	3	5	176
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	16	<5	<5	<5	170
Zinc	7440-66-6	5	mg/kg	12	9	10	16	228
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	7	5	6	5	57



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34694	V34697	V34700	V34703	V34706
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-016	EB2203032-017	EB2203032-018	EB2203032-019	EB2203032-020
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.2	6.1	6.2	6.4	7.1
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-1.0	<0.5	-1.5	<0.5	7.1
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		144	42	9	15	65
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.1	6.4	7.8	6.4	3.4
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	3.6
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	0.6	<0.1	0.8	7.3
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.6	<0.5	1.5	<0.5	3.3
ANC as CaCO3	----	0.1	% CaCO3		0.2	<0.1	0.1	<0.1	0.3
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.4	1.6	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		40	10	<10	<10	120
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	0.01	<0.01	<0.01	0.34
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		110	30	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2890	3800	670	740	34300
Arsenic	7440-38-2	5	mg/kg		121	78	8	<5	33
Barium	7440-39-3	10	mg/kg		30	30	60	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		18	29	<2	4	26
Cobalt	7440-48-4	2	mg/kg		10	10	16	3	63
Copper	7440-50-8	5	mg/kg		77	240	41	7	364
Iron	7439-89-6	50	mg/kg		20800	25800	2390	1060	78800
Lead	7439-92-1	5	mg/kg		<5	5	<5	8	17



Analytical Results

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

Sample ID

				V34694	V34697	V34700	V34703	V34706
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203032-016	EB2203032-017	EB2203032-018	EB2203032-019	EB2203032-020
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	51	38	625	62	912
Nickel	7440-02-0	2	mg/kg	19	23	9	<2	77
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	48	83	6	12	406
Zinc	7440-66-6	5	mg/kg	44	51	11	<5	268
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	37	11	3	6	10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34708	V34712	V34715	V34718	V34721
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-021	EB2203032-023	EB2203032-024	EB2203032-025	EB2203032-026
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.6	6.6	7.5	7.8	7.3
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		85.9	-1.6	-6.8	-16.7	-6.3
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		235	29	103	102	34
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		2.4	6.7	6.9	7.1	6.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		57.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		71.6	0.6	0.3	<0.1	0.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		7.4	1.9	7.4	17.3	6.9
ANC as CaCO3	----	0.1	% CaCO3		0.8	0.2	0.8	1.8	0.7
Fizz Rating	----	0	Fizz Unit		0	0	0	1	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	2.6	2.1	2.2	1.2
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		550	<10	<10	20	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		3.05	0.01	0.02	0.02	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	40	20	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		29800	8620	16300	23400	16600
Arsenic	7440-38-2	5	mg/kg		206	32	31	56	28
Barium	7440-39-3	10	mg/kg		<10	120	70	30	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		23	45	26	25	21
Cobalt	7440-48-4	2	mg/kg		44	51	29	41	38
Copper	7440-50-8	5	mg/kg		239	150	174	184	152
Iron	7439-89-6	50	mg/kg		74600	45700	49600	55300	43600
Lead	7439-92-1	5	mg/kg		9	<5	<5	<5	<5



Analytical Results

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

Sample ID

				V34708	V34712	V34715	V34718	V34721
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203032-021	EB2203032-023	EB2203032-024	EB2203032-025	EB2203032-026
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	604	1150	504	667	680
Nickel	7440-02-0	2	mg/kg	60	69	53	56	55
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	364	131	158	172	114
Zinc	7440-66-6	5	mg/kg	116	74	123	95	106
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	32	11	53	63	18



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34724	V34726	V34727	V34730	V34733
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-027	EB2203032-028	EB2203032-029	EB2203032-030	EB2203032-031
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.0	6.9	5.4	5.3	5.8
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.7	<0.5	<0.5	<0.5	<0.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		34	31	7	24	22
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.5	6.5	5.6	5.7	6.0
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.8	0.8	4.7	3.2	2.8
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		4.0	<0.5	<0.5	<0.5	<0.5
ANC as CaCO3	----	0.1	% CaCO3		0.4	<0.1	<0.1	<0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		1.6	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	40	40
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	10	<10	10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		12600	4100	1270	750	630
Arsenic	7440-38-2	5	mg/kg		18	30	7	6	<5
Barium	7440-39-3	10	mg/kg		20	20	10	20	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		32	33	5	2	2
Cobalt	7440-48-4	2	mg/kg		40	8	<2	2	4
Copper	7440-50-8	5	mg/kg		252	92	21	16	12
Iron	7439-89-6	50	mg/kg		39600	15000	13200	9380	8510
Lead	7439-92-1	5	mg/kg		9	10	<5	<5	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V34724	V34726	V34727	V34730	V34733
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203032-027	EB2203032-028	EB2203032-029	EB2203032-030	EB2203032-031
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	272	142	<5	17	56
Nickel	7440-02-0	2	mg/kg	74	31	<2	3	4
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	102	44	12	6	<5
Zinc	7440-66-6	5	mg/kg	171	39	<5	7	11
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	16	11	<1	<1	1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34736	V34739	V34742	V34744	V34766
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-032	EB2203032-033	EB2203032-034	EB2203032-035	EB2203032-037
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.6	6.1	6.3	7.0	5.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	<0.5	<0.5	<0.5	<0.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		29	28	17	17	43
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.4	6.2	7.1	6.3	6.0
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.0	1.3	<0.1	1.2	1.6
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	<0.5	<0.5	<0.5	<0.5
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	<0.1	<0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		40	20	20	10	80
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		960	800	710	400	440
Arsenic	7440-38-2	5	mg/kg		<5	10	14	<5	<5
Barium	7440-39-3	10	mg/kg		10	<10	<10	<10	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		7	10	8	5	<2
Cobalt	7440-48-4	2	mg/kg		5	<2	11	<2	<2
Copper	7440-50-8	5	mg/kg		64	20	36	11	24
Iron	7439-89-6	50	mg/kg		22000	6220	22100	8350	4100
Lead	7439-92-1	5	mg/kg		<5	<5	10	5	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V34736	V34739	V34742	V34744	V34766
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2203032-032	EB2203032-033	EB2203032-034	EB2203032-035	EB2203032-037
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	124	46	221	43	<5
Nickel	7440-02-0	2	mg/kg	7	2	8	3	2
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	43	44	37	11	<5
Zinc	7440-66-6	5	mg/kg	21	5	9	<5	5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	3	6	4	3	1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34769	V34772	V34775	V34778	V34780
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-038	EB2203032-039	EB2203032-040	EB2203032-041	EB2203032-042
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.4	6.8	7.0	7.3	7.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		<0.5	<0.5	<0.5	<0.5	<0.5
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		124	98	105	89	47
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.3	7.3	7.0	7.0	7.3
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		<0.5	<0.5	<0.5	<0.5	<0.5
ANC as CaCO3	----	0.1	% CaCO3		<0.1	<0.1	<0.1	<0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		230	180	190	120	60
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		20	20	20	120	10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1110	680	1800	760	1080
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		<10	10	30	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		3	3	4	5	7
Cobalt	7440-48-4	2	mg/kg		3	6	181	6	10
Copper	7440-50-8	5	mg/kg		65	67	150	61	73
Iron	7439-89-6	50	mg/kg		33700	18700	30000	24900	33400
Lead	7439-92-1	5	mg/kg		35	15	13	19	29



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34769	V34772	V34775	V34778	V34780
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00
Compound	CAS Number	LOR	Unit		EB2203032-038	EB2203032-039	EB2203032-040	EB2203032-041	EB2203032-042
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		150	258	2020	255	443
Nickel	7440-02-0	2	mg/kg		5	4	98	6	9
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		15	14	9	25	40
Zinc	7440-66-6	5	mg/kg		15	18	69	31	44
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		6	5	7	11	8

CERTIFICATE OF ANALYSIS

Work Order	: EB2203035	Page	: 1 of 4
Amendment	: 1		
Client	: C & R CONSULTING PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: ALEXANDER BARNES	Contact	: Princess Marcelo
Address	: 188 ROSS RIVER ROAD	Address	: 2 Byth Street Stafford QLD Australia 4053
	AITKENVALE QUEENSLAND 4812		
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Agate Creek Geochemistry	Date Samples Received	: 01-Feb-2022 09:00
Order number	: ----	Date Analysis Commenced	: 15-Feb-2022
C-O-C number	: ----	Issue Date	: 10-Mar-2022 15:31
Sampler	: PETER NEVILLE		
Site	: ----		
Quote number	: TV/178/21		
No. of samples received	: 3		
No. of samples analysed	: 3		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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.

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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Amendment (10/3/22): This report has been amended and re-released to allow the reporting of additional analytical data, specifically Thorium that was missed at the log-in stage.
- 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)				Sample ID	V32228 - V32258 Composite	V34619 - V34636 Composite	V34745 - V34762 Composite	----	----
Sampling date / time					01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2203035-001	EB2203035-002	EB2203035-003	-----	-----	-----
Result				Result	Result	Result	----	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	5.7	7.3	7.4	----	----	----
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t	-2.8	-8.4	-2.8	----	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	102	70	67	----	----	----
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit	6.6	7.0	6.7	----	----	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t	<0.1	<0.1	<0.1	----	----	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t	1.2	<0.1	0.9	----	----	----
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	2.8	8.4	2.8	----	----	----
ANC as CaCO3	----	0.1	% CaCO3	0.3	0.8	0.3	----	----	----
Fizz Rating	----	0	Fizz Unit	0	0	0	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	<1.0	1.4	<1.0	----	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg	20	<10	<10	----	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	<0.01	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	110	60	60	----	----	----
ED093S: Soluble Major Cations									
Calcium	7440-70-2	10	mg/kg	<10	<10	<10	----	----	----
Magnesium	7439-95-4	10	mg/kg	<10	<10	<10	----	----	----
Sodium	7440-23-5	10	mg/kg	100	70	70	----	----	----
Potassium	7440-09-7	10	mg/kg	<10	<10	<10	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg	1100	7440	850	----	----	----
Arsenic	7440-38-2	5	mg/kg	<5	15	<5	----	----	----
Barium	7440-39-3	10	mg/kg	50	60	<10	----	----	----
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	----	----	----
Boron	7440-42-8	50	mg/kg	<50	<50	<50	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V32228 - V32258 Composite	V34619 - V34636 Composite	V34745 - V34762 Composite	----	----
Sampling date / time				01-Feb-2022 00:00	01-Feb-2022 00:00	01-Feb-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2203035-001	EB2203035-002	EB2203035-003	-----	-----
				Result	Result	Result	----	----
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	25	15	4	----	----
Cobalt	7440-48-4	2	mg/kg	2	64	5	----	----
Copper	7440-50-8	5	mg/kg	5	76	20	----	----
Iron	7439-89-6	50	mg/kg	6770	23600	19300	----	----
Lead	7439-92-1	5	mg/kg	7	5	<5	----	----
Manganese	7439-96-5	5	mg/kg	142	664	129	----	----
Nickel	7440-02-0	2	mg/kg	16	80	6	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	----	----
Vanadium	7440-62-2	5	mg/kg	7	47	16	----	----
Zinc	7440-66-6	5	mg/kg	10	70	14	----	----
EG020T: Total Metals by ICP-MS								
Thorium	7440-29-1	0.1	mg/kg	0.6	0.9	1.7	----	----
Molybdenum	7439-98-7	0.1	mg/kg	3.7	1.3	0.2	----	----
Antimony	7440-36-0	0.1	mg/kg	0.3	0.2	1.8	----	----
Uranium	7440-61-1	0.1	mg/kg	0.3	0.6	0.5	----	----
Tellurium	22541-49-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2203945**
Client : **C & R CONSULTING PTY LTD**
Contact : ALEXANDER BARNES
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : ----
Project : Agate Creek Geochemistry
Order number : ----
C-O-C number : ----
Sampler : PETER NEVILLE (ALS Geochemistry)
Site : ----
Quote number : TV/178/21
No. of samples received : 14
No. of samples analysed : 14

Page : 1 of 8
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 15-Feb-2022 08:45
Date Analysis Commenced : 16-Feb-2022
Issue Date : 22-Feb-2022 15:39



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	Position	Accreditation Category
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EG035T (Total Mercury) Sample V34448(EB2203945-014) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EG005T (Total Metals by ICP-AES): EB2203885-003 shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.



Analytical Results

Sub-Matrix: PULP
 (Matrix: SOIL)

				Sample ID	V34409	V34412	V34415	V34418	V34421
				Sampling date / time	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]
Compound	CAS Number	LOR	Unit		EB2203945-001	EB2203945-002	EB2203945-003	EB2203945-004	EB2203945-005
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.7	6.4	6.7	6.2	6.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-4.7	-1.4	-6.7	-6.6	-7.0
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		40	57	23	20	22
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.1	4.8	6.2	6.0	6.2
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		3.5	2.4	2.2	2.2	1.0
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		4.7	3.2	6.7	6.6	7.6
ANC as CaCO3	----	0.1	% CaCO3		0.5	0.3	0.7	0.7	0.8
Fizz Rating	----	0	Fizz Unit		0	0	1	1	1
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	60	<10	<10	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	0.06	<0.01	<0.01	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		5290	4470	3070	3060	1260
Arsenic	7440-38-2	5	mg/kg		6	14	8	<5	13
Barium	7440-39-3	10	mg/kg		20	40	20	60	40
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		4	6	8	7	14
Cobalt	7440-48-4	2	mg/kg		<2	7	2	<2	<2
Copper	7440-50-8	5	mg/kg		9	9	<5	<5	<5
Iron	7439-89-6	50	mg/kg		16700	20700	12900	6060	13900
Lead	7439-92-1	5	mg/kg		6	9	<5	7	6
Manganese	7439-96-5	5	mg/kg		46	234	125	78	108
Nickel	7440-02-0	2	mg/kg		4	6	2	2	2



Analytical Results

Sub-Matrix: PULP
 (Matrix: SOIL)

				Sample ID	V34409	V34412	V34415	V34418	V34421
Sampling date / time					[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]
Compound	CAS Number	LOR	Unit		EB2203945-001	EB2203945-002	EB2203945-003	EB2203945-004	EB2203945-005
				Result	Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		8	11	8	7	<5
Zinc	7440-66-6	5	mg/kg		28	46	14	12	<5
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		7	5	6	4	5



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)				Sample ID	V34424	V34427	V34430	V34433	V34436
Sampling date / time					[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]
Compound	CAS Number	LOR	Unit		EB2203945-006	EB2203945-007	EB2203945-008	EB2203945-009	EB2203945-010
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.6	6.7	6.5	6.4	6.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-8.5	-7.9	-4.2	-2.9	-3.2
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		20	18	19	16	24
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.8	6.0	6.1	6.1	6.3
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		2.8	2.3	5.3	2.9	2.6
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		8.5	7.9	4.2	2.9	3.2
ANC as CaCO3	----	0.1	% CaCO3		0.9	0.8	0.4	0.3	0.3
Fizz Rating	----	0	Fizz Unit		1	1	0	0	0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	<10	<10
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2230	2160	4070	3900	4680
Arsenic	7440-38-2	5	mg/kg		<5	11	<5	<5	<5
Barium	7440-39-3	10	mg/kg		10	10	<10	20	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		11	8	3	5	4
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	5
Iron	7439-89-6	50	mg/kg		6460	8850	2760	4740	3170
Lead	7439-92-1	5	mg/kg		<5	<5	10	8	6
Manganese	7439-96-5	5	mg/kg		66	67	28	49	32
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	<2	<2



Analytical Results

Sub-Matrix: PULP
 (Matrix: SOIL)

				Sample ID	V34424	V34427	V34430	V34433	V34436
Sampling date / time					[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]
Compound	CAS Number	LOR	Unit		EB2203945-006	EB2203945-007	EB2203945-008	EB2203945-009	EB2203945-010
				Result	Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg		6	6	9	7	8
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		6	4	4	2	5



Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)				Sample ID	V34439	V34442	V34445	V34448	----
Sampling date / time					[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	----
Compound	CAS Number	LOR	Unit		EB2203945-011	EB2203945-012	EB2203945-013	EB2203945-014	-----
				Result	Result	Result	Result	Result	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.7	7.0	6.6	5.1	----
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-7.0	-8.4	-2.9	23.7	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		17	28	25	172	----
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.4	6.4	5.9	2.7	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	19.9	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.2	1.9	3.0	25.6	----
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		7.0	8.4	3.5	7.2	----
ANC as CaCO3	----	0.1	% CaCO3		0.7	0.8	0.4	0.7	----
Fizz Rating	----	0	Fizz Unit		1	1	0	1	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	<10	<10	450	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	0.02	1.01	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	----
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		3500	4730	4810	1820	----
Arsenic	7440-38-2	5	mg/kg		<5	6	8	66	----
Barium	7440-39-3	10	mg/kg		20	30	10	40	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	----
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		6	8	5	10	----
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	<2	----
Copper	7440-50-8	5	mg/kg		<5	5	9	27	----
Iron	7439-89-6	50	mg/kg		5010	4700	4140	23000	----
Lead	7439-92-1	5	mg/kg		5	7	7	7	----
Manganese	7439-96-5	5	mg/kg		53	39	25	75	----
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	3	----



Analytical Results

Sub-Matrix: PULP
 (Matrix: SOIL)

				Sample ID	V34439	V34442	V34445	V34448	----
				Sampling date / time	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	[10-Feb-2022]	----
Compound	CAS Number	LOR	Unit		EB2203945-011	EB2203945-012	EB2203945-013	EB2203945-014	-----
					Result	Result	Result	Result	----
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	8	----
Vanadium	7440-62-2	5	mg/kg		<5	<5	6	7	----
Zinc	7440-66-6	5	mg/kg		<5	7	<5	<5	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	0.3	----
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		4	5	5	1	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2213934**
Client : **C & R CONSULTING PTY LTD**
Contact : MR MATT KNOTT
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : +61 07 47253751
Project : Agate Creek Geochemistry
Order number : ----
C-O-C number : ----
Sampler : Peter Neville (ALS Geochemistry)
Site : ----
Quote number : TV/178/21
No. of samples received : 73
No. of samples analysed : 73

Page : 1 of 32
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 16-May-2022 09:00
Date Analysis Commenced : 19-May-2022
Issue Date : 30-May-2022 15:12



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is 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, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EG005T (Total Metals by ICP-AES): V34909 (EB2213934-001) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V34912 (EB2213934-002) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V34939 (EB2213934-011) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V34969 (EB2213934-021) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V35047 (EB2213934-041) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V35050 (EB2213934-042) shows poor matrix spike recovery due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V35077 (EB2213934-051) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): V35107 (EB2213934-061) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- 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)				Sample ID	V34909	V34912	V34915	V34918	V34921
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-001	EB2213934-002	EB2213934-003	EB2213934-004	EB2213934-005
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.0	7.0	5.8	5.8	6.5
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.3	-4.8	-4.3	-3.5	-4.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		79	77	34	43	70
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.0	7.2	6.6	5.8	6.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		2.1	<0.1	0.8	2.6	0.7
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		4.2	4.8	4.3	3.5	5.0
ANC as CaCO3	----	0.1	% CaCO3		0.4	0.5	0.4	0.4	0.5
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		40	60	<10	50	100
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.03	<0.01	<0.01	<0.01	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		90	60	30	10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		750	700	880	810	810
Arsenic	7440-38-2	5	mg/kg		5	5	6	<5	<5
Barium	7440-39-3	10	mg/kg		40	30	40	20	160
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		<2	3	4	<2	2
Cobalt	7440-48-4	2	mg/kg		3	<2	<2	2	11
Copper	7440-50-8	5	mg/kg		<5	5	6	5	<5
Iron	7439-89-6	50	mg/kg		2530	20000	6370	8030	33900
Lead	7439-92-1	5	mg/kg		10	<5	7	10	11



Analytical Results

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

Sample ID

				V34909	V34912	V34915	V34918	V34921
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-001	EB2213934-002	EB2213934-003	EB2213934-004	EB2213934-005
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	29	110	184	82	1340
Nickel	7440-02-0	2	mg/kg	4	2	<2	3	4
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	<5	8	<5	5
Zinc	7440-66-6	5	mg/kg	20	15	11	20	135
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	5	7	3	2	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34924	V34927	V34930	V34933	V34936
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-006	EB2213934-007	EB2213934-008	EB2213934-009	EB2213934-010
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.6	7.5	7.4	7.8	7.8
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.6	-5.3	-8.6	-11.1	-9.8
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		52	51	43	36	49
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		3.9	4.2	7.1	7.0	4.3
NAG (pH 4.5)	----	0.1	kg H2SO4/t		0.7	0.4	<0.1	<0.1	0.4
NAG (pH 7.0)	----	0.1	kg H2SO4/t		2.3	2.2	<0.1	<0.1	1.6
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		8.5	9.0	8.6	11.1	13.2
ANC as CaCO3	----	0.1	% CaCO3		0.9	0.9	0.9	1.1	1.3
Fizz Rating	----	0	Fizz Unit		0	0	0	1	1
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		50	50	30	20	40
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.16	0.12	<0.01	<0.01	0.11
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		8670	4620	3090	7960	8590
Arsenic	7440-38-2	5	mg/kg		14	<5	<5	7	15
Barium	7440-39-3	10	mg/kg		40	<10	20	20	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		13	7	7	11	14
Cobalt	7440-48-4	2	mg/kg		21	11	11	28	16
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	39
Iron	7439-89-6	50	mg/kg		28600	14100	19400	25400	25000
Lead	7439-92-1	5	mg/kg		20	12	<5	6	18



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V34924	V34927	V34930	V34933	V34936
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-006	EB2213934-007	EB2213934-008	EB2213934-009	EB2213934-010
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	327	161	419	216	232
Nickel	7440-02-0	2	mg/kg	35	16	23	56	19
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	22	11	8	15	22
Zinc	7440-66-6	5	mg/kg	308	104	129	297	148
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	2	2	4	4	3



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34939	V34942	V34945	V34948	V34951
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-011	EB2213934-012	EB2213934-013	EB2213934-014	EB2213934-015
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.1	6.1	6.0	5.6	5.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-8.6	-6.5	-6.3	-6.4	-5.3
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		45	30	20	26	22
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.8	7.4	7.1	7.1	6.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.6	<0.1	<0.1	<0.1	0.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		9.2	6.5	6.3	6.4	5.3
ANC as CaCO3	----	0.1	% CaCO3		0.9	0.7	0.6	0.6	0.5
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		40	20	<10	10	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		4000	800	680	590	650
Arsenic	7440-38-2	5	mg/kg		<5	8	13	14	31
Barium	7440-39-3	10	mg/kg		20	10	20	<10	40
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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	4	3	3
Cobalt	7440-48-4	2	mg/kg		13	5	6	5	6
Copper	7440-50-8	5	mg/kg		<5	14	13	16	7
Iron	7439-89-6	50	mg/kg		29600	35000	31800	18000	22700
Lead	7439-92-1	5	mg/kg		111	15	14	13	17



Analytical Results

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

Sample ID

				V34939	V34942	V34945	V34948	V34951
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-011	EB2213934-012	EB2213934-013	EB2213934-014	EB2213934-015
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	407	859	904	644	396
Nickel	7440-02-0	2	mg/kg	33	4	6	6	16
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	9	10	11	5	5
Zinc	7440-66-6	5	mg/kg	231	62	58	44	84
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	3	2	2	<1	1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34954	V34957	V34960	V34963	V34966
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-016	EB2213934-017	EB2213934-018	EB2213934-019	EB2213934-020
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.3	5.9	5.6	5.2	4.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-5.1	-5.6	-5.2	-5.0	-2.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		18	20	16	22	33
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.1	7.0	7.0	6.8	5.5
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	0.3	2.5
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		5.4	5.6	5.2	5.6	3.2
ANC as CaCO3	----	0.1	% CaCO3		0.6	0.6	0.5	0.6	0.3
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		<10	10	10	20	80
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	0.02	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		560	1040	820	1230	520
Arsenic	7440-38-2	5	mg/kg		16	11	30	26	6
Barium	7440-39-3	10	mg/kg		10	60	40	480	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	2	<1
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		4	4	5	8	3
Cobalt	7440-48-4	2	mg/kg		6	5	4	11	6
Copper	7440-50-8	5	mg/kg		10	18	15	19	6
Iron	7439-89-6	50	mg/kg		28400	24300	20300	29900	750
Lead	7439-92-1	5	mg/kg		17	13	10	20	15



Analytical Results

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

Sample ID

				V34954	V34957	V34960	V34963	V34966
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-016	EB2213934-017	EB2213934-018	EB2213934-019	EB2213934-020
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	572	473	471	918	14
Nickel	7440-02-0	2	mg/kg	7	8	14	12	3
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	8	7	7	10	<5
Zinc	7440-66-6	5	mg/kg	62	54	69	90	45
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	1	1	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V34969	V34972	V34975	V34978	V34981
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-021	EB2213934-022	EB2213934-023	EB2213934-024	EB2213934-025
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.0	5.1	4.7	5.2	5.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.3	-4.9	-3.1	-4.3	-4.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		33	24	36	30	50
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		5.1	5.4	4.5	6.2	6.2
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		3.6	4.2	2.6	1.2	0.6
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		3.9	5.2	4.6	4.9	4.7
ANC as CaCO3	----	0.1	% CaCO3		0.4	0.5	0.5	0.5	0.5
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		80	50	70	60	100
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	0.01	0.05	0.02	0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		820	590	560	470	620
Arsenic	7440-38-2	5	mg/kg		8	6	15	<5	<5
Barium	7440-39-3	10	mg/kg		<10	<10	<10	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		3	3	3	5	4
Cobalt	7440-48-4	2	mg/kg		4	4	<2	<2	<2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		1300	870	1490	1240	870
Lead	7439-92-1	5	mg/kg		12	25	33	29	33



Analytical Results

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

Sample ID

				V34969	V34972	V34975	V34978	V34981
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-021	EB2213934-022	EB2213934-023	EB2213934-024	EB2213934-025
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	14	14	21	17	14
Nickel	7440-02-0	2	mg/kg	3	2	<2	2	<2
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	23	20	9	11	26
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35002	V35005	V35008	V35011	V35014
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-026	EB2213934-027	EB2213934-028	EB2213934-029	EB2213934-030
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		4.6	5.0	4.9	4.7	5.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.6	-3.8	-4.0	-3.8	-3.3
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		56	176	166	305	307
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		4.9	7.2	5.8	5.6	5.9
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		2.4	<0.1	1.7	4.4	1.3
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		3.9	3.8	4.3	4.1	3.9
ANC as CaCO3	----	0.1	% CaCO3		0.4	0.4	0.4	0.4	0.4
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		30	20	20	60	370
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	0.01	0.01	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		20	250	240	440	210
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2430	580	780	1540	1060
Arsenic	7440-38-2	5	mg/kg		13	<5	8	23	<5
Barium	7440-39-3	10	mg/kg		50	30	<10	10	110
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		8	5	4	6	3
Cobalt	7440-48-4	2	mg/kg		<2	<2	<2	7	<2
Copper	7440-50-8	5	mg/kg		9	<5	<5	12	<5
Iron	7439-89-6	50	mg/kg		16600	6110	9360	12800	610
Lead	7439-92-1	5	mg/kg		7	<5	<5	<5	8



Analytical Results

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

Sample ID

				V35002	V35005	V35008	V35011	V35014
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-026	EB2213934-027	EB2213934-028	EB2213934-029	EB2213934-030
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	39	<5	<5	15	<5
Nickel	7440-02-0	2	mg/kg	4	3	<2	9	<2
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	18	<5	8	14	<5
Zinc	7440-66-6	5	mg/kg	20	6	9	41	6
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	2	<1	<1	1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35017	V35020	V35023	V35026	V35029
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-031	EB2213934-032	EB2213934-033	EB2213934-034	EB2213934-035
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.1	6.6	7.1	7.0	6.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.4	-1.2	-2.3	-2.9	-3.0
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		174	155	135	91	85
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.7	5.7	8.2	7.4	7.4
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	5.4	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.4	1.2	2.3	2.9	3.0
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.1	0.2	0.3	0.3
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	3.3	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		40	40	30	40	30
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		200	140	140	80	100
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1100	780	1060	990	4000
Arsenic	7440-38-2	5	mg/kg		16	<5	14	5	10
Barium	7440-39-3	10	mg/kg		200	40	530	180	80
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		4	3	4	4	12
Cobalt	7440-48-4	2	mg/kg		12	<2	62	112	55
Copper	7440-50-8	5	mg/kg		10	<5	26	15	16
Iron	7439-89-6	50	mg/kg		1350	420	1300	6980	25200
Lead	7439-92-1	5	mg/kg		24	14	22	8	11



Analytical Results

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

Sample ID

				V35017	V35020	V35023	V35026	V35029
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-031	EB2213934-032	EB2213934-033	EB2213934-034	EB2213934-035
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	612	34	1840	613	250
Nickel	7440-02-0	2	mg/kg	4	3	13	16	64
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	6	<5	10	<5	13
Zinc	7440-66-6	5	mg/kg	9	18	35	57	289
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	5	11	8	8	7



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35032	V35035	V35038	V35041	V35044
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-036	EB2213934-037	EB2213934-038	EB2213934-039	EB2213934-040
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.1	7.1	6.8	7.1	7.8
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.8	-3.2	-2.0	-1.8	-4.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		89	87	69	43	84
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.2	8.1	6.6	6.9	7.2
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.5	<0.1	0.7	0.8	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.8	3.5	2.0	1.8	4.6
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.4	0.2	0.2	0.5
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		40	60	40	20	50
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		90	60	60	40	40
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		690	620	580	720	640
Arsenic	7440-38-2	5	mg/kg		<5	27	<5	<5	<5
Barium	7440-39-3	10	mg/kg		40	320	40	20	240
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		5	9	3	6	4
Cobalt	7440-48-4	2	mg/kg		3	6	4	3	8
Copper	7440-50-8	5	mg/kg		7	6	6	7	12
Iron	7439-89-6	50	mg/kg		4630	3530	4300	5710	26900
Lead	7439-92-1	5	mg/kg		7	23	8	10	14



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				V35032	V35035	V35038	V35041	V35044
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-036	EB2213934-037	EB2213934-038	EB2213934-039	EB2213934-040
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	53	798	104	132	947
Nickel	7440-02-0	2	mg/kg	6	6	3	6	3
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	<5	<5	<5	10
Zinc	7440-66-6	5	mg/kg	23	12	16	17	43
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	6	5	4	2	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35047	V35050	V35053	V35056	V35059
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-041	EB2213934-042	EB2213934-043	EB2213934-044	EB2213934-045
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.2	7.2	8.0	7.2	7.3
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.7	-3.2	-4.1	-1.6	-2.2
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		59	63	53	46	50
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.6	7.0	7.6	7.7	7.5
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		3.0	3.2	4.1	1.6	2.2
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.3	0.4	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	1.1	<1.0	1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		30	20	30	30	30
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		30	20	10	20	20
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		560	800	1040	700	830
Arsenic	7440-38-2	5	mg/kg		<5	19	26	8	10
Barium	7440-39-3	10	mg/kg		20	60	80	20	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	2	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		3	6	6	3	5
Cobalt	7440-48-4	2	mg/kg		7	12	6	2	4
Copper	7440-50-8	5	mg/kg		9	13	14	10	9
Iron	7439-89-6	50	mg/kg		14200	44400	16600	10300	18100
Lead	7439-92-1	5	mg/kg		18	10	11	11	10



Analytical Results

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

Sample ID

				V35047	V35050	V35053	V35056	V35059
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-041	EB2213934-042	EB2213934-043	EB2213934-044	EB2213934-045
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	1090	1270	432	186	318
Nickel	7440-02-0	2	mg/kg	3	12	14	5	8
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	16	5	6	7
Zinc	7440-66-6	5	mg/kg	39	96	44	25	40
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	4	3	4	3	3



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35062	V35065	V35068	V35071	V35074
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-046	EB2213934-047	EB2213934-048	EB2213934-049	EB2213934-050
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.7	6.6	6.4	6.0	5.9
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-1.9	-2.2	-2.4	-1.2	-1.9
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		43	30	28	51	35
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.4	7.6	7.4	7.3	7.4
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.2	2.5	2.7	1.8	2.2
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.3	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		30	20	20	90	20
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	0.01	0.01	0.02	0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		620	800	670	860	1450
Arsenic	7440-38-2	5	mg/kg		53	12	<5	9	<5
Barium	7440-39-3	10	mg/kg		40	90	50	20	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		2	5	4	4	7
Cobalt	7440-48-4	2	mg/kg		4	7	<2	3	3
Copper	7440-50-8	5	mg/kg		10	5	10	8	<5
Iron	7439-89-6	50	mg/kg		15900	23200	11100	17400	9900
Lead	7439-92-1	5	mg/kg		13	13	10	17	6



Analytical Results

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

Sample ID

				V35062	V35065	V35068	V35071	V35074
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-046	EB2213934-047	EB2213934-048	EB2213934-049	EB2213934-050
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	308	678	289	410	176
Nickel	7440-02-0	2	mg/kg	24	6	4	8	9
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	5	7	<5	6	6
Zinc	7440-66-6	5	mg/kg	40	67	36	33	40
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	2	2	1	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35077	V35080	V35083	V35086	V35089
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-051	EB2213934-052	EB2213934-053	EB2213934-054	EB2213934-055
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.2	6.1	6.4	6.1	6.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-4.6	-3.0	-3.2	-5.1	-5.4
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		24	24	26	30	32
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.4	7.6	7.6	7.5	7.5
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		4.9	3.0	3.5	5.1	5.4
ANC as CaCO3	----	0.1	% CaCO3		0.5	0.3	0.4	0.5	0.5
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		20	10	20	20	30
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	0.01	<0.01	<0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		810	950	710	1910	4740
Arsenic	7440-38-2	5	mg/kg		7	14	12	17	23
Barium	7440-39-3	10	mg/kg		10	10	40	30	40
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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	6	5	8	9
Cobalt	7440-48-4	2	mg/kg		4	4	3	6	12
Copper	7440-50-8	5	mg/kg		8	15	13	13	15
Iron	7439-89-6	50	mg/kg		20000	17000	15400	30200	34200
Lead	7439-92-1	5	mg/kg		13	14	8	8	15



Analytical Results

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

Sample ID

				V35077	V35080	V35083	V35086	V35089
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-051	EB2213934-052	EB2213934-053	EB2213934-054	EB2213934-055
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	490	421	316	455	452
Nickel	7440-02-0	2	mg/kg	6	9	7	14	41
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	7	8	<5	9	9
Zinc	7440-66-6	5	mg/kg	38	35	29	74	244
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	1	<1	1	1	1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35092	V35095	V35098	V35101	V35104
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-056	EB2213934-057	EB2213934-058	EB2213934-059	EB2213934-060
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.4	5.7	5.0	4.7	5.0
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.3	-3.1	-0.9	1.5	-0.7
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		26	13	32	47	32
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.9	7.3	6.5	4.8	5.3
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.3	<0.1	0.7	1.5	5.4
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		3.3	3.1	1.5	<0.5	1.0
ANC as CaCO3	----	0.1	% CaCO3		0.3	0.3	0.2	<0.1	<0.1
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		20	10	40	110	60
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	0.02	0.05	0.01
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		1220	990	760	790	770
Arsenic	7440-38-2	5	mg/kg		5	<5	8	17	8
Barium	7440-39-3	10	mg/kg		10	30	<10	<10	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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		5	4	5	6	7
Cobalt	7440-48-4	2	mg/kg		3	6	7	4	4
Copper	7440-50-8	5	mg/kg		11	11	<5	<5	<5
Iron	7439-89-6	50	mg/kg		12200	26700	1660	1650	1430
Lead	7439-92-1	5	mg/kg		12	12	30	21	17



Analytical Results

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

Sample ID

				V35092	V35095	V35098	V35101	V35104
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-056	EB2213934-057	EB2213934-058	EB2213934-059	EB2213934-060
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	212	686	23	14	19
Nickel	7440-02-0	2	mg/kg	6	6	6	7	8
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	6	8	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	50	105	22	28	32
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35107	V35110	V35113	V35116	V35119
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-061	EB2213934-062	EB2213934-063	EB2213934-064	EB2213934-065
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.3	5.3	5.2	5.1	5.3
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-1.0	-1.5	-1.4	-1.0	-1.2
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		22	24	16	27	29
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.6	7.1	6.4	6.7	7.1
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	<0.1	<0.1
NAG (pH 7.0)	----	0.1	kg H2SO4/t		1.4	<0.1	1.2	1.1	<0.1
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		1.6	2.1	2.0	1.6	1.8
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.2	0.2	0.2	0.2
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	<1.0
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		40	40	20	50	60
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	0.02	0.02	0.02	0.02
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		880	750	800	420	770
Arsenic	7440-38-2	5	mg/kg		6	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		<10	<10	10	<10	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
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	5	7	3	6
Cobalt	7440-48-4	2	mg/kg		2	3	2	<2	2
Copper	7440-50-8	5	mg/kg		<5	<5	<5	<5	<5
Iron	7439-89-6	50	mg/kg		1530	3840	2900	1270	8520
Lead	7439-92-1	5	mg/kg		17	18	19	9	22



Analytical Results

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

Sample ID

				V35107	V35110	V35113	V35116	V35119
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-061	EB2213934-062	EB2213934-063	EB2213934-064	EB2213934-065
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	8	66	34	21	174
Nickel	7440-02-0	2	mg/kg	4	3	4	2	3
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	18	31	34	13	43
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	<1	<1	<1	<1



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35122	V35125	V35128	V35131	V35134
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213934-066	EB2213934-067	EB2213934-068	EB2213934-069	EB2213934-070
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		5.8	6.1	6.4	7.0	6.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-2.0	-4.1	-4.4	-1.7	1.7
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		27	21	41	59	73
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		6.8	7.2	7.2	4.3	3.8
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	0.4	0.9
NAG (pH 7.0)	----	0.1	kg H2SO4/t		0.4	<0.1	<0.1	1.9	3.2
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		2.3	4.1	4.4	5.7	3.8
ANC as CaCO3	----	0.1	% CaCO3		0.2	0.4	0.4	0.6	0.4
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	<1.0	1.9
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		50	10	40	80	100
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.01	<0.01	<0.01	0.13	0.18
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	<10	<10
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		740	800	1150	3500	4380
Arsenic	7440-38-2	5	mg/kg		6	10	8	11	16
Barium	7440-39-3	10	mg/kg		20	90	50	40	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	2	1
Chromium	7440-47-3	2	mg/kg		9	8	6	10	9
Cobalt	7440-48-4	2	mg/kg		2	3	<2	14	21
Copper	7440-50-8	5	mg/kg		<5	10	10	9	30
Iron	7439-89-6	50	mg/kg		2150	15200	7950	19200	29400
Lead	7439-92-1	5	mg/kg		20	8	5	30	47



Analytical Results

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

Sample ID

				V35122	V35125	V35128	V35131	V35134
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213934-066	EB2213934-067	EB2213934-068	EB2213934-069	EB2213934-070
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Manganese	7439-96-5	5	mg/kg	46	606	182	392	874
Nickel	7440-02-0	2	mg/kg	4	6	6	17	19
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	<5	<5	<5	8	12
Zinc	7440-66-6	5	mg/kg	33	71	38	232	125
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK040S: Fluoride Soluble								
Fluoride	16984-48-8	1	mg/kg	<1	1	1	2	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35137	V35140	V35143	----	----
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2213934-071	EB2213934-072	EB2213934-073	-----	-----
				Result	Result	Result	Result	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.8	8.2	8.8	----	----
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-3.7	-5.0	-1.2	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		32	42	50	----	----
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		7.1	6.5	4.7	----	----
NAG (pH 4.5)	----	0.1	kg H2SO4/t		<0.1	<0.1	<0.1	----	----
NAG (pH 7.0)	----	0.1	kg H2SO4/t		<0.1	0.6	1.2	----	----
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		4.3	7.1	7.3	----	----
ANC as CaCO3	----	0.1	% CaCO3		0.4	0.7	0.7	----	----
Fizz Rating	----	0	Fizz Unit		0	0	0	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	<1.0	<1.0	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		20	20	30	----	----
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		0.02	0.07	0.20	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	<10	<10	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Aluminium	7429-90-5	50	mg/kg		2380	5780	7350	----	----
Arsenic	7440-38-2	5	mg/kg		8	<5	5	----	----
Barium	7440-39-3	10	mg/kg		40	20	30	----	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	----	----
Boron	7440-42-8	50	mg/kg		<50	<50	<50	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		7	10	15	----	----
Cobalt	7440-48-4	2	mg/kg		7	6	8	----	----
Copper	7440-50-8	5	mg/kg		9	16	15	----	----
Iron	7439-89-6	50	mg/kg		10400	15600	28000	----	----
Lead	7439-92-1	5	mg/kg		9	11	20	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	V35137	V35140	V35143	----	----
Sampling date / time					10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2213934-071	EB2213934-072	EB2213934-073	-----	-----
					Result	Result	Result	----	----
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Manganese	7439-96-5	5	mg/kg		228	602	1680	----	----
Nickel	7440-02-0	2	mg/kg		10	7	13	----	----
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	----	----
Vanadium	7440-62-2	5	mg/kg		<5	12	14	----	----
Zinc	7440-66-6	5	mg/kg		73	39	53	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	----
EK040S: Fluoride Soluble									
Fluoride	16984-48-8	1	mg/kg		2	2	2	----	----

CLIENT: WULGURU TECHNICAL SERVICES
PROJECT: AGATE CREEK GOLD MINE
REPORT: WASTE ROCK CHARACTERISATION
DATE: AUGUST 2022



Appendix B – Kinetic Results

CERTIFICATE OF ANALYSIS

Work Order : **EB2212859**
Client : **C & R CONSULTING PTY LTD**
Contact : DR CHRIS CUFF
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : +61 07 47253751
Project : Agate Creek KLC - Leach 0
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 10-May-2022 11:47
Date Analysis Commenced : 11-May-2022
Issue Date : 18-May-2022 09:29



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is 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, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EG020F-Dissolved Metals by ICP-MS: Sample EB2212787-001 shows poor matrix spike recovery due to sample matrix interference. Confirmed by re-extraction and re-analysis.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2212859-001	EB2212859-002	EB2212859-003	EB2212859-004	-----
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.38	6.49	5.82	5.84	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	20	553	231	38	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	13	359	150	25	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	89	8	<1	----
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	2	10	5	2	----
Total Alkalinity as CaCO3	----	1	mg/L	2	10	5	2	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	2	3	2	2	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	3	49	1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	136	21	7	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	1	<1	<1	----
Magnesium	7439-95-4	1	mg/L	<1	21	2	<1	----
Sodium	7440-23-5	1	mg/L	4	69	36	4	----
Potassium	7440-09-7	1	mg/L	<1	2	5	4	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.06	<0.01	<0.01	0.03	----
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	----
Boron	7440-42-8	0.05	mg/L	<0.05	0.19	0.17	0.13	----
Barium	7440-39-3	0.001	mg/L	<0.001	0.306	0.013	0.034	----
Beryllium	7440-41-7	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	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2212859-001	EB2212859-002	EB2212859-003	EB2212859-004	-----
Result				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	0.002	----
Manganese	7439-96-5	0.001	mg/L	<0.001	0.031	0.018	0.015	----
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	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Tellurium	22541-49-7	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
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	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	6.6	0.6	0.2	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2212859-001	EB2212859-002	EB2212859-003	EB2212859-004	-----
				Result	Result	Result	Result	----
EA047 Free Draining Leach Column								
∅ Initial weight of sample	----	0.001	g	2000	2000	2000	2000	----
∅ Leachate added	----	0.01	mL	900	900	900	900	----
∅ Leachate collected	----	0.01	mL	370	460	460	480	----
∅ Initial pH	----	0.01	pH Unit	7.14	7.13	4.98	5.82	----
∅ Initial Electrical Conductivity	----	1	µS/cm	20	546	231	36	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2214607**
Client : **C & R CONSULTING PTY LTD**
Contact : DR CHRIS CUFF
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : +61 07 47253751
Project : Agate Creek KLC - Leach 1
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 25-May-2022 11:06
Date Analysis Commenced : 25-May-2022
Issue Date : 06-Jun-2022 12:00



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

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- Analytical Results

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Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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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.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract 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

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				25-May-2022 00:00	25-May-2022 00:00	25-May-2022 00:00	25-May-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2214607-001	EB2214607-002	EB2214607-003	EB2214607-004	-----
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.51	6.50	6.30	5.88	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	14	68	223	13	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	9	44	145	8	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	4	12	<1	----
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	1	4	3	<1	----
Total Alkalinity as CaCO3	----	1	mg/L	1	4	3	<1	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	1	2	3	1	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	63	<1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	11	15	3	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	<1	<1	----
Magnesium	7439-95-4	1	mg/L	<1	1	3	<1	----
Sodium	7440-23-5	1	mg/L	2	12	34	1	----
Potassium	7440-09-7	1	mg/L	<1	<1	5	2	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	0.07	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	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	0.13	1.15	0.26	----
Barium	7440-39-3	0.001	mg/L	<0.001	0.001	0.037	0.004	----
Beryllium	7440-41-7	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	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				25-May-2022 00:00	25-May-2022 00:00	25-May-2022 00:00	25-May-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2214607-001	EB2214607-002	EB2214607-003	EB2214607-004	-----
				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.002	<0.001	----
Manganese	7439-96-5	0.001	mg/L	<0.001	0.004	0.035	0.006	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.003	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.131	0.007	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.001	<0.001	<0.001	----
Tellurium	22541-49-7	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
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	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	4.0	0.8	<0.1	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				25-May-2022 00:00	25-May-2022 00:00	25-May-2022 00:00	25-May-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2214607-001	EB2214607-002	EB2214607-003	EB2214607-004	-----
				Result	Result	Result	Result	----
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	----
∅ Leachate collected	----	0.01	mL	760	740	750	760	----
∅ Initial pH	----	0.01	pH Unit	5.93	6.76	6.41	5.51	----
∅ Initial Electrical Conductivity	----	1	µS/cm	14	66	219	12	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2216196**
Client : **C & R CONSULTING PTY LTD**
Contact : DR CHRIS CUFF
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : +61 07 47253751
Project : Agate Creek KLC - Leach 2
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 08-Jun-2022 10:00
Date Analysis Commenced : 08-Jun-2022
Issue Date : 16-Jun-2022 09:43



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is 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, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				08-Jun-2022 00:00	08-Jun-2022 00:00	08-Jun-2022 00:00	08-Jun-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2216196-001	EB2216196-002	EB2216196-003	EB2216196-004	-----
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.53	6.24	5.88	5.57	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	15	49	43	21	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	10	32	28	14	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	<1	<1	<1	----
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	3	3	1	<1	----
Total Alkalinity as CaCO3	----	1	mg/L	3	3	1	<1	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	<1	<1	<1	<1	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	12	<1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	9	2	5	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	<1	<1	----
Magnesium	7439-95-4	1	mg/L	<1	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	2	8	7	2	----
Potassium	7440-09-7	1	mg/L	<1	<1	1	2	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	0.16	0.04	<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	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	0.07	0.18	0.42	----
Barium	7440-39-3	0.001	mg/L	0.002	0.001	0.003	0.005	----
Beryllium	7440-41-7	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	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				08-Jun-2022 00:00	08-Jun-2022 00:00	08-Jun-2022 00:00	08-Jun-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2216196-001	EB2216196-002	EB2216196-003	EB2216196-004	-----
				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	0.001	0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	0.006	0.003	0.003	0.017	----
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	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	0.011	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Tellurium	22541-49-7	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Iron	7439-89-6	0.05	mg/L	<0.05	0.06	<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	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	2.4	0.5	<0.1	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				08-Jun-2022 00:00	08-Jun-2022 00:00	08-Jun-2022 00:00	08-Jun-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2216196-001	EB2216196-002	EB2216196-003	EB2216196-004	-----
				Result	Result	Result	Result	----
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	----
∅ Leachate collected	----	0.01	mL	720	600	650	670	----
∅ Initial pH	----	0.01	pH Unit	4.61	6.22	5.66	5.06	----
∅ Initial Electrical Conductivity	----	1	µS/cm	19	48	41	20	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2218098**
Client : **C & R CONSULTING PTY LTD**
Contact : DR CHRIS CUFF
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : +61 07 47253751
Project : Agate Creek KLC - Leach 3
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 23-Jun-2022 12:34
Date Analysis Commenced : 23-Jun-2022
Issue Date : 30-Jun-2022 16:47



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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 below. Electronic signing is 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, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				23-Jun-2022 00:00	23-Jun-2022 00:00	23-Jun-2022 00:00	23-Jun-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2218098-001	EB2218098-002	EB2218098-003	EB2218098-004	-----
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.87	6.48	5.98	5.66	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	14	44	38	21	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	9	29	25	14	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	<1	<1	<1	----
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	3	5	5	4	----
Total Alkalinity as CaCO3	----	1	mg/L	3	5	5	4	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	2	3	3	3	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	11	<1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	8	1	5	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	<1	<1	----
Magnesium	7439-95-4	1	mg/L	<1	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	2	8	6	2	----
Potassium	7440-09-7	1	mg/L	<1	<1	1	2	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.01	0.02	0.02	<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	0.002	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	0.08	0.19	0.69	----
Barium	7440-39-3	0.001	mg/L	0.002	<0.001	0.002	0.004	----
Beryllium	7440-41-7	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	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	0.002	<0.001	<0.001	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				23-Jun-2022 00:00	23-Jun-2022 00:00	23-Jun-2022 00:00	23-Jun-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2218098-001	EB2218098-002	EB2218098-003	EB2218098-004	-----
				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	0.009	0.003	0.004	0.015	----
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	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	<0.005	0.024	<0.005	0.010	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.001	<0.001	<0.001	----
Tellurium	22541-49-7	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
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	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	2.1	0.4	<0.1	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				23-Jun-2022 00:00	23-Jun-2022 00:00	23-Jun-2022 00:00	23-Jun-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2218098-001	EB2218098-002	EB2218098-003	EB2218098-004	-----
				Result	Result	Result	Result	----
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	----
∅ Leachate collected	----	0.01	mL	700	610	630	660	----
∅ Initial pH	----	0.01	pH Unit	5.49	6.21	5.50	5.13	----
∅ Initial Electrical Conductivity	----	1	µS/cm	14	44	38	20	----

CERTIFICATE OF ANALYSIS

Work Order : **EB2219694**
Client : **C & R CONSULTING PTY LTD**
Contact : DR CHRIS CUFF
Address : 188 ROSS RIVER ROAD
AITKENVALE QUEENSLAND 4812
Telephone : +61 07 47253751
Project : Agate Creek KLC - Leach 4
Order number : ----
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : TV/110/21 v2
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 5
Laboratory : Environmental Division Brisbane
Contact : Princess Marcelo
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 07-Jul-2022 10:46
Date Analysis Commenced : 07-Jul-2022
Issue Date : 15-Jul-2022 08:59



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

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 below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				07-Jul-2022 00:00	07-Jul-2022 00:00	07-Jul-2022 00:00	07-Jul-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2219694-001	EB2219694-002	EB2219694-003	EB2219694-004	-----
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.48	6.15	5.59	5.40	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	10	41	36	25	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	6	27	23	16	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	<1	<1	<1	----
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	<1	1	<1	<1	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	1	<1	<1	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	2	1	1	2	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	10	<1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	7	<1	5	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	<1	<1	----
Magnesium	7439-95-4	1	mg/L	<1	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	2	7	6	3	----
Potassium	7440-09-7	1	mg/L	<1	<1	1	3	----
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	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	0.07	0.12	0.25	0.96	----
Barium	7440-39-3	0.001	mg/L	0.001	<0.001	0.002	0.008	----
Beryllium	7440-41-7	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	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				07-Jul-2022 00:00	07-Jul-2022 00:00	07-Jul-2022 00:00	07-Jul-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2219694-001	EB2219694-002	EB2219694-003	EB2219694-004	-----
				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	0.004	0.002	0.003	0.013	----
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	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	0.006	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.001	<0.001	<0.001	----
Tellurium	22541-49-7	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
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	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	2.0	0.5	0.1	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time					07-Jul-2022 00:00	07-Jul-2022 00:00	07-Jul-2022 00:00	07-Jul-2022 00:00	----
Compound	CAS Number	LOR	Unit		EB2219694-001	EB2219694-002	EB2219694-003	EB2219694-004	-----
					Result	Result	Result	Result	----
EA047 Free Draining Leach Column									
ø Leachate added	----	0.01	mL		800	800	800	800	----
ø Leachate collected	----	0.01	mL		710	590	610	620	----
ø Initial pH	----	0.01	pH Unit		5.59	6.56	5.91	5.57	----
ø Initial Electrical Conductivity	----	1	µS/cm		9	38	32	23	----

CERTIFICATE OF ANALYSIS

Work Order	: EB2221216	Page	: 1 of 5
Amendment	: 1		
Client	: C & R CONSULTING PTY LTD	Laboratory	: Environmental Division Brisbane
Contact	: DR CHRIS CUFF	Contact	: Princess Marcelo
Address	: 188 ROSS RIVER ROAD	Address	: 2 Byth Street Stafford QLD Australia 4053
	AITKENVALE QUEENSLAND 4812		
Telephone	: +61 07 47253751	Telephone	: +61-7-3243 7222
Project	: Agate Creek KLC - Leach 5	Date Samples Received	: 21-Jul-2022 09:41
Order number	: ---	Date Analysis Commenced	: 21-Jul-2022
C-O-C number	: ---	Issue Date	: 29-Jul-2022 16:11
Sampler	: ---		
Site	: ---		
Quote number	: TV/110/21 v2		
No. of samples received	: 4		
No. of samples analysed	: 4		



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Amendment (29/7/22): This report has been amended as a result of changes to the contacts for the distribution of the report. All analysis results are as per the previous report.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: LEACHATE
 (Matrix: WATER)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				21-Jul-2022 00:00	21-Jul-2022 00:00	21-Jul-2022 00:00	21-Jul-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2221216-001	EB2221216-002	EB2221216-003	EB2221216-004	-----
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.00	6.30	5.45	5.55	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	17	36	36	18	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	11	23	23	12	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	<1	<1	<1	----
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	1	2	<1	<1	----
Total Alkalinity as CaCO3	----	1	mg/L	1	2	<1	<1	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	3	3	3	3	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	10	1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	6	<1	4	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	<1	<1	----
Magnesium	7439-95-4	1	mg/L	<1	<1	<1	<1	----
Sodium	7440-23-5	1	mg/L	4	6	5	3	----
Potassium	7440-09-7	1	mg/L	<1	<1	1	2	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	0.02	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	<0.001	<0.001	----
Boron	7440-42-8	0.05	mg/L	<0.05	0.11	0.30	0.80	----
Barium	7440-39-3	0.001	mg/L	0.005	<0.001	0.002	0.005	----
Beryllium	7440-41-7	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	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----



Analytical Results

Sub-Matrix: **LEACHATE**
 (Matrix: **WATER**)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				21-Jul-2022 00:00	21-Jul-2022 00:00	21-Jul-2022 00:00	21-Jul-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2221216-001	EB2221216-002	EB2221216-003	EB2221216-004	-----
				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Manganese	7439-96-5	0.001	mg/L	0.016	0.002	0.004	0.007	----
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	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	0.007	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.001	<0.001	<0.001	----
Tellurium	22541-49-7	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Uranium	7440-61-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
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	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	2.1	0.5	0.1	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				Column 1 V32228 to V32258	Column 2 V34619 to V34636	Column 3 V34745 to V34762	Column 4 V34048 to V34117	----
Sampling date / time				21-Jul-2022 00:00	21-Jul-2022 00:00	21-Jul-2022 00:00	21-Jul-2022 00:00	----
Compound	CAS Number	LOR	Unit	EB2221216-001	EB2221216-002	EB2221216-003	EB2221216-004	-----
Result				Result	Result	Result	Result	----
EA047 Free Draining Leach Column								
∅ Leachate added	----	0.01	mL	800	800	800	800	----
∅ Leachate collected	----	0.01	mL	710	590	590	650	----
∅ Initial pH	----	0.01	pH Unit	5.61	6.31	5.73	5.42	----
∅ Initial Electrical Conductivity	----	1	µS/cm	19	35	34	18	----



Appendix C – Queensland Government Science Notes

Measuring salinity

Salinity is the accumulation of salt in soil and water. High salt levels can adversely affect plant growth, soil structure, water quality and infrastructure.

High salt levels occur naturally in many parts of the Australian landscape but in many cases have been exacerbated where human activities accelerate the mobilisation and accumulation of salt.

Methods for measuring salinity

It is important to identify saline areas so they can be appropriately managed. There are a range of methods for measuring salinity. Two common ways are by using an electrical conductivity (EC) meter or by measuring how much salt is in a solution of soil or water.

An EC meter measures how much electricity moves through a solution—the saltier the solution, the more electricity moves through it and the higher the conductivity reading. EC can be easily measured in the field or in a laboratory. A wide range of EC meters are available, ranging in price and size.

Electrical conductivity can be expressed in different units—for soil, EC is measured in dS/m (deci-Siemens/metre), while water is measured in $\mu\text{S}/\text{cm}$ (micro-Siemens/centimetre). It is important to always calibrate the EC meter before use.

Another way to detect salinity is by measuring how much salt is in a solution—this measurement is called total dissolved solids (TDS) or total dissolved ions (TDI). It is measured in units of mg/l (milligrams/litre) or ppm (parts per million). Higher readings mean more salt is present in the solution.

Measuring salinity in water

Salinity in surface water and groundwater can be easily measured in the field by collecting a water sample, inserting an EC probe into the sample and reading the value shown on the meter.

Alternatively, a water sample can be collected and forwarded to a laboratory for testing of salinity and chemical composition. The container should be entirely filled with the water sample to exclude air. Samples for laboratory analysis should be forwarded as quickly as possible. Delays and high temperatures will change the composition of salts in the sample, affecting the results. Typical salinity values for water are given in Table 3.

Measuring salinity in soil

EC is usually measured in the field using a 1:5 soil:water suspension (EC1:5), or in a laboratory using a soil saturation extract EC (EC_{se}) or a 1:5 solution.

To measure EC1:5 in the field, put approximately 10 millilitres of distilled water, rainwater or tank water into a jar, container or tube. Add small soil particles until the contents of the container increase by 5 millilitres to bring the volume to 15 millilitres. Add additional water to bring the total volume to 30 millilitres. Shake intermittently for five minutes and allow it to settle for five minutes. Dip an EC probe into the solution and take a reading. Remember to wash the EC probe after using it.

The interpretation of EC values to determine soil salinity levels depends on the texture of the soil. Salts are readily dissolved out of sandy soils whereas salts are more tightly held by clay soils. This means that the same amount of salt will have a greater impact on sandy soils than it will on clay soils. As a guide, sandy or loamy

soils are moderately saline if EC1:5 is above 0.3 deci- Siemens/metre, and clay soils are moderately saline if EC1:5 is above 0.6 deci- Siemens/metre.

As the EC1:5 is measured on a diluted sample, a more realistic measurement of the actual salt levels that a plant will encounter can be measured on a saturated extract (EC_{se}). This can be done by some laboratories. As a guide, soils are generally considered saline if their EC_{se} is greater than 2– 4 deci- Siemens/metre.

Salinity tolerance ratings for soils are usually based on EC_{se} values, rather than EC1:5. To convert EC1:5 to EC_{se}, identify the texture of the soil, and use the guide in Table 1

Table. 1. Conversion of EC1:5 to EC_{se} for a range of soil textures

Soil type	Multiply EC1:5 by
Sand	23
Sandy loam	14
Loam	10
Clay loam	9
Light clay	7.5
Heavy clay	6

For example, sand with an EC1:5 of 0.3 dS/m is equivalent to an EC_{se} of 6.9 dS/m, while a heavy clay with an EC1:5 of 0.3 dS/m is equivalent to an EC_{se} of 1.8 dS/m. Soil salinity classes are shown in Table 2.

Table 2. Approximate soil salinity classes

Salinity rating	EC _{se} (dS/m)	
Slightly saline	1.5—2	Salinity effects usually minimal
Moderately saline	2—6	Yield of salt sensitive plants restricted
Highly saline	6—15	Only salt tolerant plants yield satisfactorily
Extremely saline	>15	Few salt tolerant plants yield satisfactorily

Salinity tolerance of crops

As a general guide, salt tolerant crops include barley, canola, cotton, beetroot, soybean, wheat, olives and sorghum. Moderately salt tolerant crops include lucerne, tomato, cabbage, potato and carrots. Low salt tolerant crops include maize, sugar cane, celery, lettuce and pumpkin.

Table 3. Guide to typical salinity limits for waters. It is important to also check other water quality parameters (e.g. chemical composition, sodium adsorption ration, metals etc) before use.

		Electrical conductivity (EC)		TDS
		($\mu\text{S/cm}$)	(dS/m)	(mg/l or ppm)
Distilled water		1	0.001	0.67
Rainfall		30	0.03	20
Sewage effluent		840	0.84	565
Freshwater		0-1500	0-1.5	0-1000
Great Artesian Basin Water		700-1000	0.7-1.0	470-670
Brackish water		1500-15000	1.5-15	1000-10050
Upper limit recommended for drinking		1600	1.6	1070
Tolerances of livestock to salinity in drinking water (at these values, animals may have an initial reluctance to drink, but stock should adapt without loss of production)	Beef cattle	5970-7460	5.9-7.5	4000-5000
	Dairy cattle	3730-5970	3.7-5.9	2500-4000
	Sheep	7460-14925	7.5-14.9	5000-10000
	Horses	5970-8955	5.9-8.9	4000-6000
	Pigs	5970-8955	5.9-8.9	4000-6000
	Poultry	2985-4475	2.9-4.4	2000-3000
General limits for irrigation	Salt sensitive crops	650	0.65	435
	Moderately salt sensitive crops	1300	1.3	870
	Salt tolerant crops	5200	5.2	3485
	Generally too saline for crops	8100	8.1	5430
Salt water swimming pool		5970-8955	5.9-8.9	4000-6000
Seawater		55000	55	36850
Dead sea		110000	110	73700

Note: To convert from $\mu\text{S/cm}$ to dS/m, divide by 1000. To approximately convert from $\mu\text{S/cm}$ to mg/l, multiply by 0.67.

References

- ANZECC (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality. ANZECC and ARMCANZ.
- Charman PEV and Murphy BW (2007). Soils: Their Properties and Management, 3rd Edition. Oxford University Press, South Melbourne.
- Foth HD (1990). Fundamentals of Soil Science, 8th Edition. John Wiley & Sons, New York, USA.
- Price G (ed) (2006). Australian Soil Fertility Manual, 3rd Edition. CSIRO Publishing and Fertilizer Industry Federation of Australia, Collingwood.
- Salcon (1997). Salinity Management Handbook. Department of Natural Resources, Indooroopilly.

Further information

This and other science notes are available from the Queensland Government website www.qld.gov.au – search ‘science notes’. For further information about this science notes series phone **13 QGOV** (13 74 68) – ask for science notes – Land series L137.

For further information about salinity visit < <http://www.qld.gov.au/environment/land/soil/salinity/>> or email soils@qld.gov.au.