Graphinex – Esmeralda Graphite Project Environmental Impact Statement

Appendix U – Geochemistry Assessment of Mine Materials and Tailings

GRAPHINEX

TECHNICAL REPORT

Geochemistry assessment of mine materials and tailings

Esmeralda Project

Prepared for: Graphinex and AARC

MINE WASTE AND
WATER MANAGEMENT

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TECHNICAL REPORT

Geochemistry assessment of mine materials and tailings

Esmeralda Project

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Glossary of terms and acronyms

AARC	AARC Environmental Solutions Pty Ltd
ABA	Acid Base Account. Evaluation of the balance between acid generation and acid neutralisation processes. Determines the maximum potential acidity (MPA) and the inherent acid neutralising capacity (ANC), as defined below.
ABCC	Acid buffering characteristic curve
Acidity	A measurement of the amount of acidity in a water sample generally derived using a titration method to a set pH value (in units of mg/L $CaCO_3$ equivalent).
Alkalinity	A measurement of the amount of alkalinity in a water sample generally derived using a titration method to a set pH value (in units of mg/L $CaCO_3$ equivalent).
ALS	Australian Laboratory Services.
AMD	Acid and metalliferous drainage from mine waste materials characterised by low pH, elevated metal concentrations, high sulfate concentrations and high salinity.
ANC	Acid Neutralising Capacity expressed as kg H_2SO_4 per tonne of sample. A measure of a sample's maximum potential ability to neutralise acid.
ANC:MPA	The ratio of the acid neutralising capacity to the maximum potential acidity of a sample. Used to assess the risk of a sample generating acid conditions.
AS	Australian Standards
DETSI	Department of Environment, Tourism, Science and Innovation.
Dispersive	Dispersive soil and rock materials are structurally unstable and disperse into basic particles such as sand, silt and clay in water. When a dispersive soil is wet, the basic structure has a tendency to collapse, whereas when it is dry it is prone to surface sealing and crusting.
EC	Electrical Conductivity, expressed as µS/cm.
Eh	Redox potential. A measure of the tendency of a chemical species to acquire or lose electrons to an electrode. Used to measure oxidising (+ve) or reducing (-ve) conditions in a saturated column.
EIS	Environmental Impact Statement.
ESP	Exchangeable sodium percentage provides a measure of the sodicity of a material and propensity to erode.
EA	Emmerson Aggregate
FIMS	Flow Injection Mercury System.
GAI	Geochemical Abundance Index
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
ICP-AES	Inductively Coupled Plasma Atomic Emission Spectrometry.
INAP	International Network on Acid Prevention
JORC	Joint Ore Reserves Committee
KLC	Kinetic Leach Column. Leaching setup that generates time-dependent data on the kinetics and rate of acid generation and acid neutralising reactions under laboratory controlled (or onsite conditions)
LoR	Limit of Reporting. Laboratory detection limit for the reporting of results for a particular geochemical test.
MIBC	Methyl isobutyl carbinol

MPA	Maximum Potential Acidity. Calculated by multiplying the total sulfur or sulfide-sulfur (CRS) content of a sample by 30.6 (stoichiometric factor) and expressed as kg H_2SO_4 per tonne.
NAF	Non-Acid Forming. Geochemical classification criterion for a sample that will not generate acid conditions.
NAF_{BARREN}	Non-acid forming and barren of sulfur (i.e. less than or equal to 0.1% sulfur).
NAG	Net Acid Generation
NAPP	Net Acid Producing Potential, expressed as kg H_2SO_4 per tonne. Calculated by subtracting the ANC from the MPA.
NMD	Neutral mine drainage typically caused by exposure of sulfide minerals in mine waste materials to oxygen and water and then neutralisation by gangue minerals. Typically characterised by neutral pH and elevated concentrations of salts, sulfate and metals.
Ore	Material that has been mined with sufficient value to warrant processing.
Overburden	The waste rock material found overlying the first ore horizon within the stratigraphic profile.
PAF	Potentially Acid Forming. Geochemical classification criterion for a sample that has the potential to generate acid conditions.
PC Titrator	Potentiometric Compact Titrator. PC Titrators are specially designed for routine applications and simple operation, allowing basic titration analysis from a single device.
pH	A measure of hydrogen ion (H^+) concentration.
PSD	Particle size distribution.
S	Sulfur.
SD	Saline Drainage. Water that is elevated in dissolved salts (e.g., Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, and SO_4^{2-}), but may have acidic, neutral, or alkaline pH.
Slaking	Disintegration of unconfined soil or rock after exposure to air and subsequent immersion in water.
Sodic	Sodic soil and rock materials are characterized by a disproportionately high concentration of sodium (Na) in their cation exchange complex and are innately unstable, exhibiting poor physical and chemical properties, which impede water infiltration, water availability, and ultimately plant growth.
SO_4^{2-}	Sulfate.
Static test	Procedure for characterising the geochemical nature of a sample at a single point in time. Static tests may include measurements of mineral and chemical composition of a sample and the Acid Base Account.
SWCC	Soil water characteristic curve
TC	Total Carbon (includes inorganic and organic fractions).
TOC	Total Organic Carbon
TPH	Total petroleum hydrocarbons
TRH	Total recoverable hydrocarbons
TS	Total sulfur content of a sample generally measured using a ‘LECO’ analyser expressed as total sulfur%.
TSF	Tailings storage facility
w:v	Weight to volume ratio.

1 Overview

1.1 Introduction

RGS Environmental Consultants Pty Ltd (RGS) was requested by AARC Environmental Solutions Pty Ltd (AARC) to complete a geochemistry assessment of mine materials and tailings for the Esmeralda flagship project (the Project) on behalf of Graphinex Pty Ltd. Graphinex is an integrated Australian graphite mining and battery anode manufacturing company, based in Queensland. The Esmeralda Project is located approximately 70 km south of Croydon in northwest Queensland (**Figure 1-1**) on Exploration Permit for Minerals (EPM) 28274 and is currently in the definitive feasibility stage (AARC, 2023).

This technical report documents both static (Stage 1) and kinetic (Stage 2) geochemical test results for mine materials and tailings, as well as physical test results for tailings. The differences between the geochemical and physical characteristics of the Batch 1 and Batch 2 tailings are discussed in **Section 4.6**. Mineralogical test work is included in the scope of the geochemical characterisation program.

The content of this report is intended to assist in mine planning and future environmental approvals, and to inform stakeholders regarding potential environmental and geochemical risks associated with the mine materials and tailings.

1.2 Purpose

The purpose of the geochemical assessment is to produce a technical document that will support the Environmental Impact Statement (EIS) approval process that is being coordinated by AARC. The information contained within this report is relevant to develop a sound strategy for the on site management of mine waste, including tailings. Geochemical data provides key inputs to other critical studies, such as groundwater and surface water modelling and tailings storage facility (TSF) design.

1.3 Project background

Historical drilling confirms that Esmeralda has the potential to host Australia's largest graphite resource. This geochemistry assessment of mine materials and tailings is one of a collection of baseline environmental studies that are required for future impact assessment studies and Project approval. The granite hosted ore body at Esmeralda is proposed for mining via open cut methods at mining rates of up to 3.5 Mtpa run-of-mine ore. Mineral processing is proposed on site, with flotation waste likely to be disposed as backfill into the open pit void. It is expected that mining will occur to a depth of 250 m, and that the pit will be backfilled prior to closure.

1.4 Project geology

The regional geology and structure of the Project area is illustrated in **Figure 1-2.** The targeted resource is hosted within the Proterozoic Esmeralda Supersuite granites and volcanics with low to strongly magnetic domains (Graphinex, 2024). The Esmeralda Granite consists of grey, massive, coarse-grained biotite granite with scarce pegmatitic pods and lenses, and rare xenoliths of graphite and graphitic metasediments. A conceptual cross section is shown in **Figure 1-3** to illustrate the geological sequence, drill holes, and projected open cut pit. Tertiary sediments and Jurassic-Cretaceous clastics in the Gilbert River Formation (overburden) overlie the targeted Proterozoic Esmeralda Graphite ore body, which extends at depth.

Table 1-1 provides a typical stratigraphic sequence encountered in the Project area. Non-Proterozoic units are considered the cover sequence, or overburden. This may be unconformable and varies greatly in depth (up to 90 m). The project geology is well understood and is at Measured Joint Ore Reserves Committee (JORC) Resource stage.

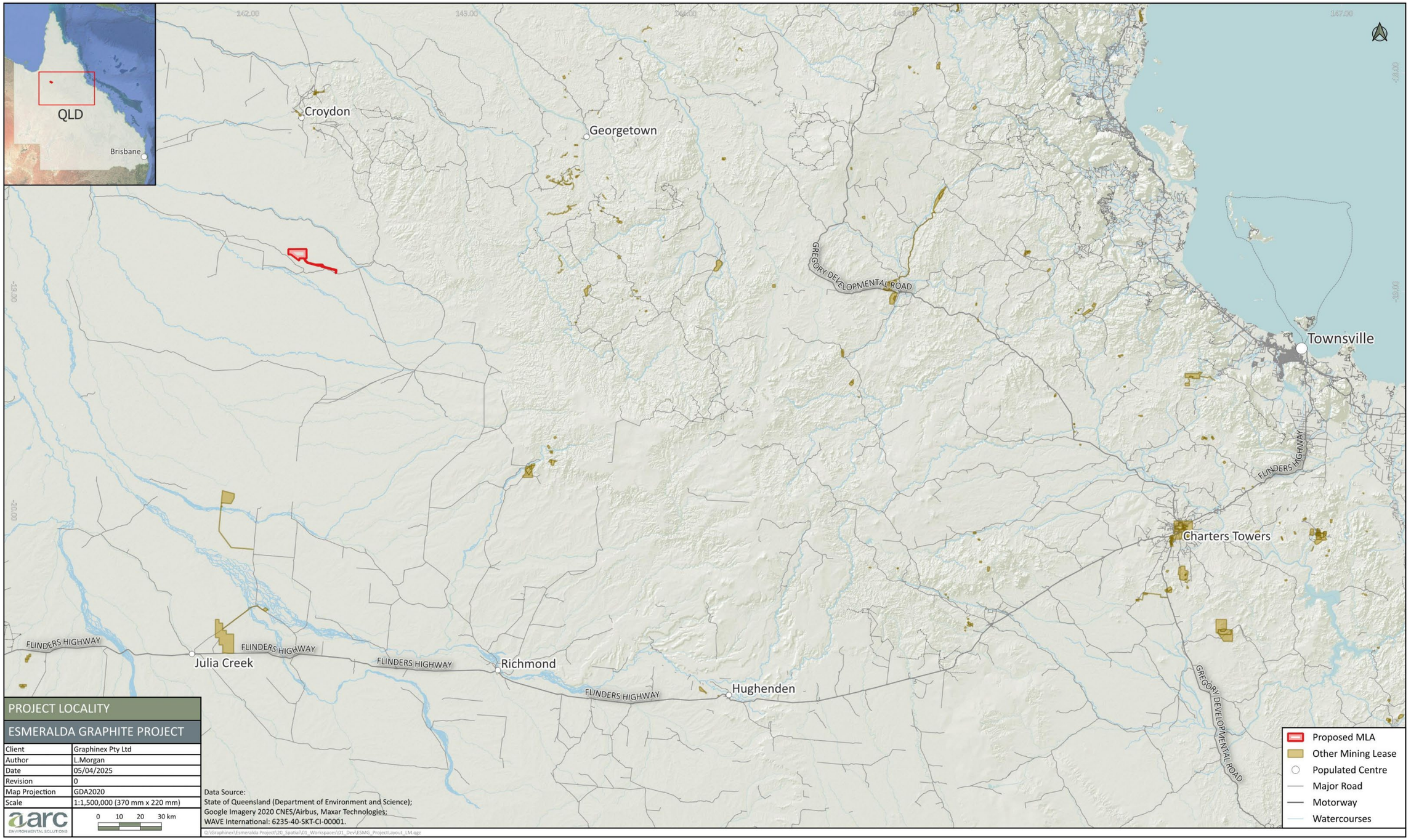


Figure 1-1: Graphinex Esmeralda mine project location

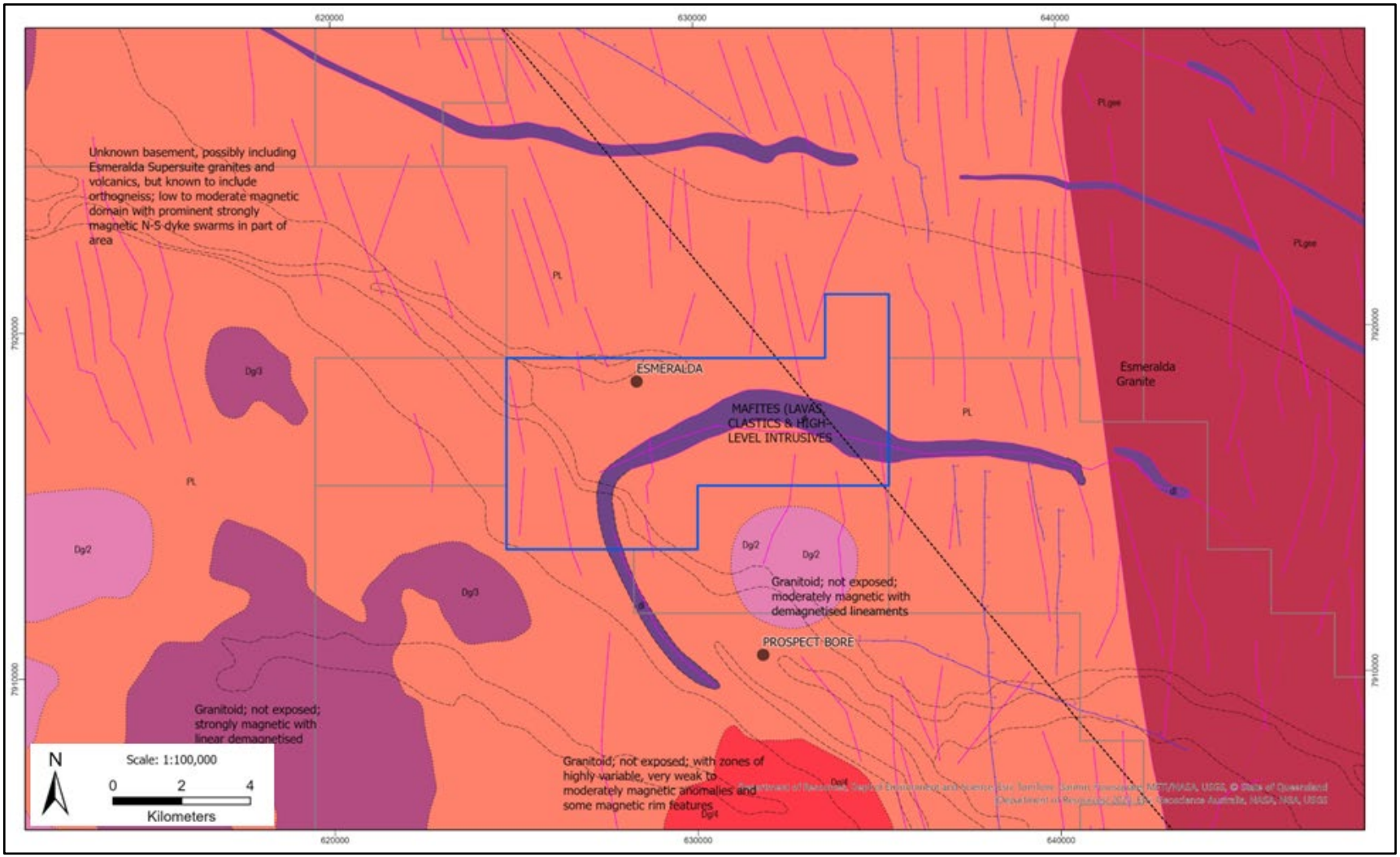


Figure 1-2: Esmeralda geology and structure

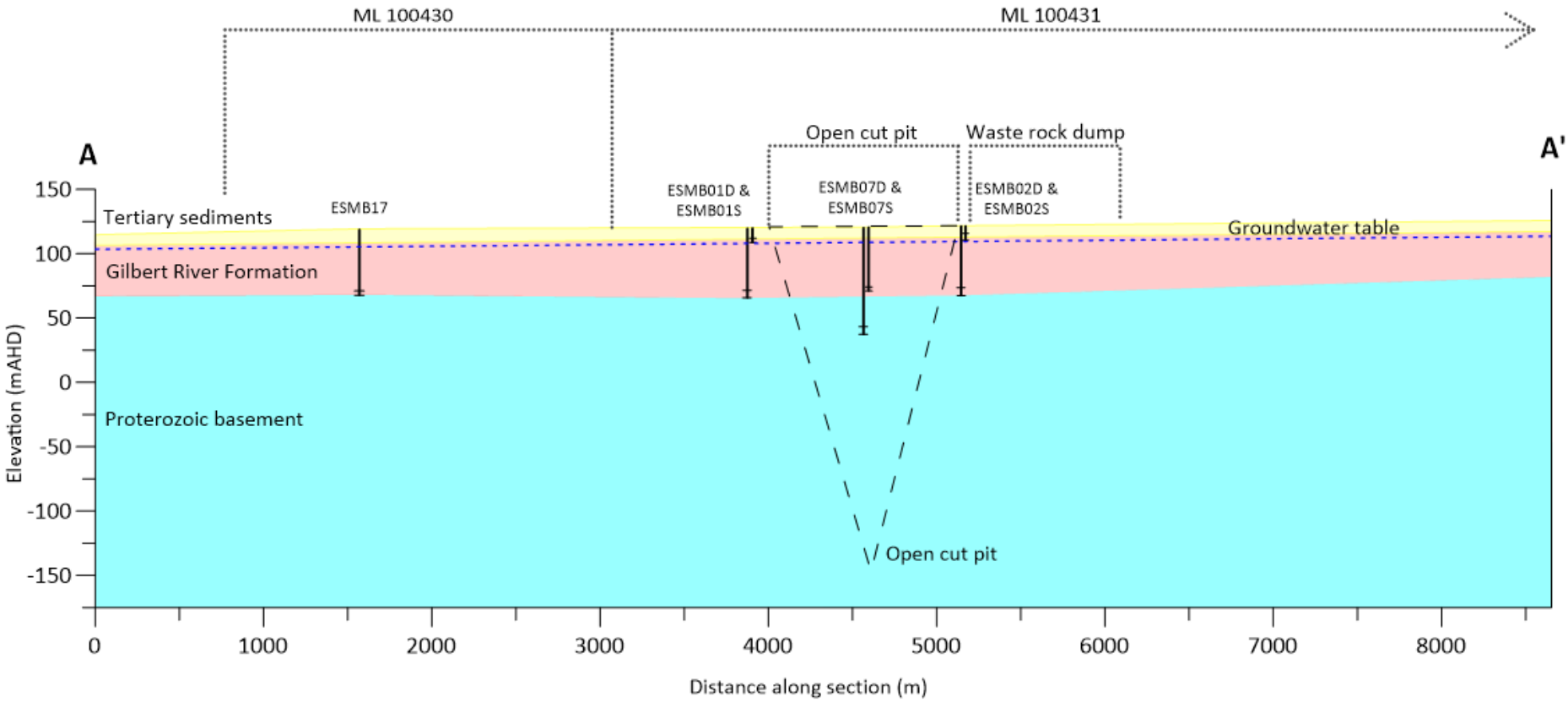


Figure 1-3: Conceptual geological cross section for the Esmeralda project

Table 1-1: Typical stratigraphic sequence at the Esmeralda Project

Graphic	Material Type	Unit	Age	Lithology
	Soil		Quaternary	Sand, gravel, silt, and mud - alluival and channel deposits
	Overburden		Tertiary-Quaternary	Residual and alluvial sands, gravels, silt, and soil
			Tertiary-Quaternary	Ferricrete, alluvium, and colluvium
		Wallumbilla Formation	Cretaceous	Sandstone and mudstone
		Gilbert River Formation	Jurassic-Cretaceous	Dominantly sandstones, lesser finer clastics
		Eulo Queen Group	Jurassic	Sandstones, siltstones, and minor conglomerates
			Permian	Rhyolites, local andesites, and grandiorites
	Orebody	Inorunie Group	Mid to Late Proterozoic	Dominantly sandstones and orthoquartzites, minor siltstones and mudstones
		Esmeralda Granite (& minor granites)	Middle Proterozoic	Dominantly biotite granites, some with muscovite and/or garnet
		Croydon Volcanic Group	Middle Proterozoic	Dominantly rhyolites and dacites, minor sediments and andesites
		Forest Home Trondhjemite	Middle Proterozoic	Biotite trondhjemite
		Langlovale Group	Middle Proterozoic	Sandstone overlain by finer clastics
		Etheridge Group	Middle Proterozoic	Dominantly fine clastics including carbonaceous shales

1.5 Desktop review

1.5.1 Groundwater quality test results

Groundwater test results from four monitoring bores located in the Esmeralda project area were sampled between 14 August 2024 and 15 August 2024. Results are included in **Attachment K** (**Table 7-1**). The results are compared against applied Australian guidelines for livestock drinking water and freshwater aquatic ecosystems trigger values (95% species protection level) (ANZG, 2018). The guideline values are intended to be used as a point of reference and do not constitute site-specific trigger values or maximum permissible concentrations of elements.

The pH of all four groundwater samples is circumneutral to alkaline and ranges from pH 8.5 to 9.0. The recommended pH for freshwater aquatic ecosystems is pH 6 to pH 9, and therefore the groundwater results are within the required range of the applied guideline criteria.

The salinity (measured as EC) is slightly brackish (890 to 1,300 µS/cm). Total dissolved solid (TDS) concentrations in groundwater are 530 to 770 mg/L. The recommended TDS for livestock drinking water is 500 mg/L and therefore the TDS values are slightly greater than the applied guideline value. The TDS of natural waters reflects the geology of source areas; the major contributing ions are typically the cations: calcium, magnesium, sodium and potassium, and the anions bicarbonate, chloride, sulfate and, in some cases, nitrate. Groundwaters typically have higher TDS concentrations than surface waters. The concentration of TDS in natural waters ranges widely, from <1 mg/L in rainwater to 35,000 mg/L in seawater. The measured TDS values for the Esmeralda groundwater samples are typical for Queensland and do not appear elevated.

The concentration of major ions in the water extracts is relatively low and dominated by sodium (Na^+), potassium (K+) and chloride (Cl^-). Potassium concentrations are typically lower than calcium (Ca^{2+}) and magnesium (Mg^{2+}) in most natural waters and these slightly higher potassium concentrations are most likely

related to the composition of the source rocks in contact with groundwater (**Section 1.5.2**). Potassium ranges from 3.5 to 7.0 mg/L, while calcium is 1.5 to 2.6 mg/L and magnesium is 0.5 to 0.9 mg/L.

Sulfate (SO_4^{2-}) concentrations are low (0.7 to 2.4 mg/L) and are well below the livestock guideline value of 1,000 mg/L. Fluoride (F^-) concentrations can be greater than the applied livestock drinking water guidelines of 2 mg/L (ANZG, 2018) in two out of the four groundwater samples. Unpolluted surface waters generally contain low concentrations of fluoride, but concentrations in groundwater may be higher in some areas. Groundwater fluoride concentrations >2 mg/L have been reported at several locations in Queensland, mainly in the Great Artesian Basin, and in some cases show concentrations >10 mg/L (ANZG, 2023).

The total alkalinity in the groundwater samples ranges from 390 to 450 mg/L (as $CaCO_3$ equivalent) and is typically elevated. The majority of the alkalinity in the samples is in the form of bicarbonate (HCO_3), although a small proportion is carbonate (CO_3^{2-}). Hydroxide alkalinity values are negligible (<5 mg/L). These values infer that the groundwater samples contain elevated acid buffering capacity.

The concentration of dissolved trace metals/metalloids in the groundwater samples has been measured both as total and dissolved (through a 0.45µm filter). Total concentrations will always be higher than dissolved and include larger molecules such as suspended solids, colloids, and organic complexes. Applied Australian guidelines for freshwater aquatic ecosystems trigger values (95% species protection level) apply to dissolved fractions, whereas livestock guideline values relate to the total concentration of the constituent (ANZG, 2018).

The results demonstrate that trace metal/metalloid concentrations are typically low and predominantly below the laboratory limit of reporting (LoR). The concentration of aluminium (Al) (3 samples), copper (2 samples), and zinc (Zn) (1 sample) in the groundwater samples can be greater than the applied freshwater aquatic ecosystem (95% species protection) guideline values. Total aluminium concentrations range from 0.012 to 17 mg/L and are greater than the applied livestock drinking water criteria of 5 mg/L in two out of four groundwater samples.

A literature review regarding the elevated aluminium concentrations is included in **Attachment L**.

1.5.2 Ore body mineralogy

RGS was provided with mineralogy results (by semi-quantitative X-Ray Diffraction, XRD) for a composite granite breccia ore body sample (T3442_MasterComp P100 3.35 mm). The analysis was performed by Nagrom and the laboratory certificate is provided in **Attachment I**. The mineralogy of the composite sample is shown in **Table 1-2.**

Table 1-2: XRD results for composite graphitic granite breccia ore body sample

	Granite ore body (T3442_MasterComp P100 3.35 mm)
Phase Name/Formula	Weight %
Quartz; SiO_2	29
Microcline; $KAlSi_3O_8$	22
Albite ($NaAlSi_3O_8$)	17
Chamosite ($Fe^{2+},Mg)_5Al(AlSi_3O_{10})(OH)_8$	12
Muscovite ($KAl_2(AlSi_3O_{10})(F,OH)_2$)	7
Graphite (C)	6
Pyrrhotite (Fe_7S_8)	4
Fluorapatite ($Ca_5(PO_4)_3F$)	1
Calcite $CaCO_3$	1
Sepiolite ($Mg_4Si_6O_{15}(OH)_2 \cdot 6H_2O$)	Trace

The major minerals in the samples are quartz (29 %), microcline (22 %), albite (17 %), chamosite (12 %), and muscovite (7%). These results are typical for an igneous granite rock, which will generally be comprised of quartz, feldspar, and mica. The feldspars present are potassium-rich (microcline, $KAlSi_3O_8$) and sodium-rich

(albite, $NaAlSi_3O_8$), which are alkali feldspars. Minor minerals include graphite (C) (6 %), the target ore resource, and pyrrhotite (Fe_7S_8) (4 %), an uncommon iron sulfide mineral.

Note: The proportion of amorphous (non-crystalline) material is not stated in the Nagrom laboratory report; the results have been standardised to exclude this fraction. As the data is presented as weight %, the removal of amorphous content can increase the proportion of remaining minerals. Results from other providers (**Section 3.2**) for tailings indicate an amorphous content of 23 to 44 %.

Pyrrhotite is often found in copper and nickel deposits and is commonly associated with dark-coloured, mafic minerals such as biotite. The more common iron sulfide mineral, pyrite (FeS_2) is the predominant cause of acid generation where acid and metalliferous drainage (AMD) issues occur. The significance of the difference in geochemistry between pyrite and pyrrhotite has only started to be more widely recognised and reported in the literature, as a result of geochemical and mineralogical studies of mine materials from relevant deposits over the past two decades.

Pyrrhotite can follow a number of reaction pathways that can be acid forming or non-acid forming (Thomas *et al*., 2001). The non-acid forming reaction pathway involves the generation of goethite and elemental sulfur (Equation 1). Another potential pathway for pyrrhotite oxidation is where iron is converted to goethite and in this situation, sulfur is fully oxidised to produce sulfuric acid (Equation 2).

Reaction Pathway 1

$$Fe_{(1-x)}S + 3(1-x)/4O_2 + (1-x)/2H_2O \rightarrow (1-x)FeOOH + S^0 \quad \textbf{[Equation 1]}$$

Pyrrhotite + Oxygen + Water → Goethite + Elemental Sulfur

Reaction Pathway 2

$$Fe_{(1-x)}S + 3(3-x)/4O_2 + (3-x)/2H_2O \rightarrow (1-x)FeOOH + H_2SO_4 \quad \textbf{[Equation 2]}$$

Pyrrhotite + Oxygen + Water → Goethite + Sulfuric Acid

Pyrrhotite may have the potential be acid generating to some extent if left exposed to oxidising conditions, although it is generally non-acid forming or acid neutral under more saturated conditions, where oxygen is essentially excluded (Schumann et al., 2015).

Accessory and trace minerals within the granite include fluorapatite ($Ca_5(PO_4)_3F$) (1 %), calcite $CaCO_3$ (1 %), and sepiolite ($Mg_4Si_6O_{15}(OH)_2 \cdot 6H_2O$) (trace). Although only a small weight percentage of the overall sample, calcite reacts with any sulfuric acid generation and is referred to as the acid neutralisation capacity (ANC). The mineralogy results suggest that ANC is likely be limited due to the low proportion of carbonate minerals (e.g. calcite). However, it is not negligible, and the samples may also have some inherent buffering capacity from muscovite, feldspar, and other silicate minerals.

Information from the desktop review has been compared with the Acid Base Accounting results in **Section 3.1** and are discussed in **Section 4**.

1.5.3 Assay data review

RGS reviewed assay data of the ore body materials (n=1,784). Twenty-two (22) metals/metalloids (Ag, Al, As, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Na, Ni, P, Pb, Sn, Sr, Ti, and Zn) were analysed by subjecting the samples to a 4-acid digestion (HCl, $HClO_4$, HF, and HNO_3), followed ICP-MS. Total carbon (TC) and total sulfur (TS) were analysed by induction furnace, and total graphitic carbon (TGC) was analysed by induction furnace and hydrochloric acid leach.

Selected results for 1,331 samples for TC, TS, and TGC are provided in **Figure 7-3** to **Figure 7-5** in **Attachment M**. The exploration drill holes are shown in **Figure 1-5**. The assay data for a small selection of samples (n=20), specifically from the available drill holes selected for the geochemical assessment (24ESMD001 and 24ESMD002) are illustrated in **Figure 1-4**.

The results demonstrate that the concentrations of TC and TGC carbon are very similar. This supports the finding that carbonate minerals are low (e.g. 1 % calcite, **Table 1-2**). RGS acknowledges that the TC and TGC ratio breaks down when considering soil, weathered overburden and other sediments that contain little graphite. For the purpose of material classifications in this geochemical assessment, however, RGS has

assumed that all total carbon in ore is total graphitic carbon, i.e., using total carbon % as a screening tool to separate low grade ore (<3% TC) and ore (>3% TC).

The concentration of TS in the assay data correlates strongly with TC, as shown in **Figure 1-4**. At the top of each drill hole, TC and TS in the overlying overburden materials is typically low. Within the ore body, an increase in TC generally equates to a rise in TS, suggesting that TS is probably an inclusion in an accessory mineral within the granite breccia or, less likely, is directly associated with the graphite xenoliths. The sulfur impurities within Esmeralda graphite are expected to be very low. Testing with a scanning electron microscope (SEM) with energy dispersive spectroscopy (EDS) can be performed to confirm this. The SEM-EDS method can microprobe selected crystals to reveal their elemental composition.

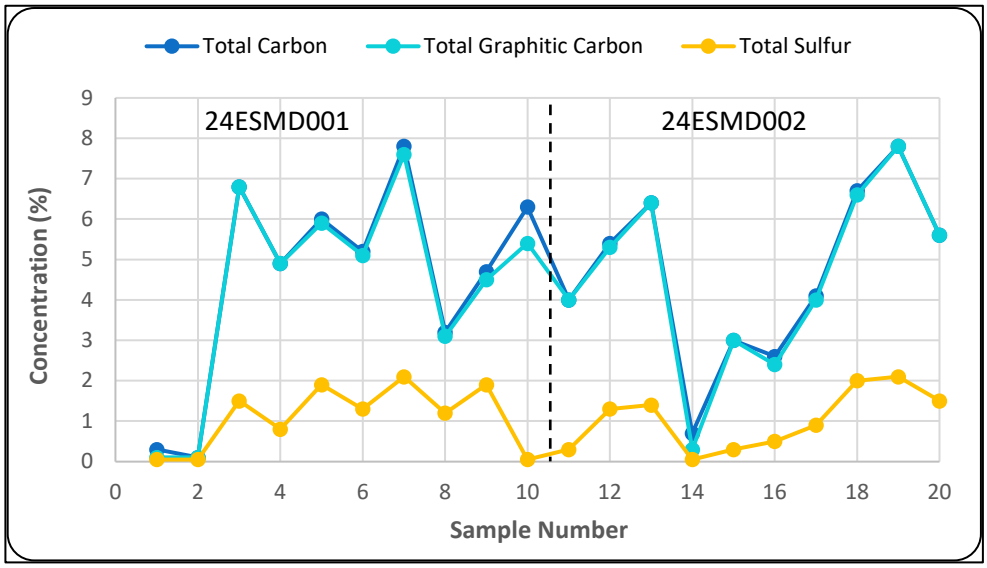


Figure 1-4: Total carbon, total graphitic carbon, and total sulfur assay data for selected samples

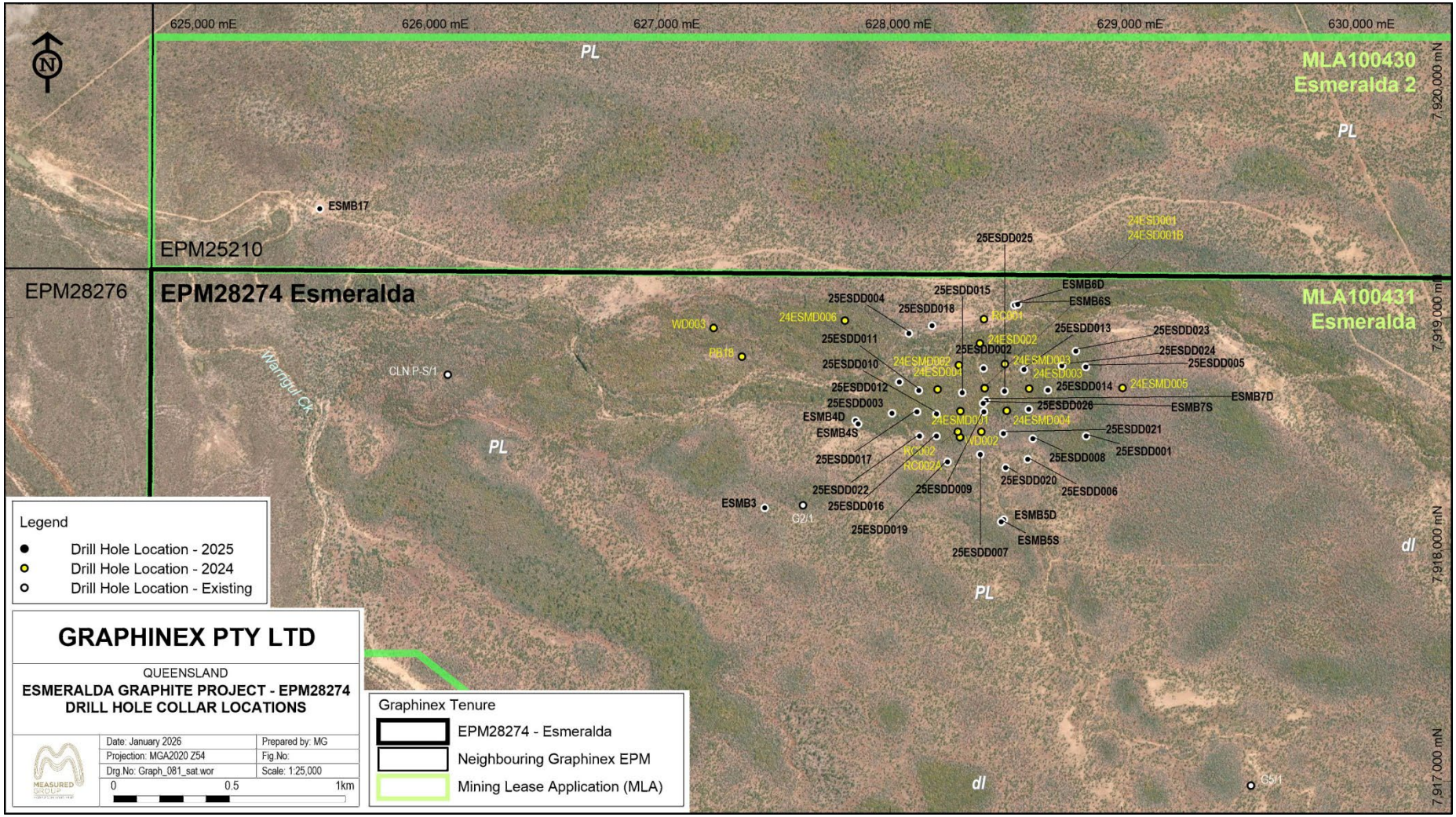


Figure 1-5: Esmeralda project 2025 drilling program and historical locations

2 Methodology

2.1 Sampling program

2.1.1 Stage 1 mine material sampling program

Graphinex completed 11 drill holes in the 2024 drilling program (**Table 2-1**). The locations of these drill holes are shown in **Figure 1-4**. After discussion, RGS and Graphinex selected 6 drill holes and 81 samples that were available for the geochemical assessment to support the EIS. A summary of the lithologies is presented in **Table 2-2**and by material type in **Table 2-3**. A sample catalogue is provided in **Attachment N**.

Individual sample masses ranged from 1.01 to 4.69 kg, for a total mass of 162 kg. A small split (up to 1 kg) of each these samples was used in the Stage 1 static geochemical assessment. The remaining mass was available for the Stage 2 kinetic test program. The samples were crushed at ALS to pass 20 mm sieve size prior to compositing.

Table 2-1: Available drill holes for sampling

Available drill hole	Depth from (m)	Depth to (m)	Selected (yes/no)	No. of samples
24ESD001	0.0	136.3	Yes	11
24ESD001B	53.6	260.0	Yes	14
24ESD002	0.0	327.8	Yes	7
24ESD003	5.7	215.7	No	--
24ESD004	5.4	220.0	Yes	-24
24ESMD001	55.3	237.5	Yes	13
24ESMD002	53.8	223.6	Yes	-12
24ESMD003	53.8	260.0	No	--
24ESMD004	53.8	270.9	No	-
24ESMD005	53.7	249.9	No	--
24ESMD006	53.8	183.5	No	--
			Total samples	**81**

Table 2-2: Summary of lithology types in sampling program

Lithology	Number of samples
Alluvium	3
Claystone – Massive and Clayey Sand	15
Sandstone - Interbedded/Bedded/Massive	10
Siltstone – Interbedded/Massive	4
Dolerite	1
Metasediments – incl. Volcanic	6
Granite – Breccia/Xenoliths	42
Total individual samples	**81**

Table 2-3: Summary of material types in sampling program

Material type	Lithology/ description	No of samples
Soil	Alluvium (shallow)	3
Overburden	Sedimentary – claystone, sandstone, and siltstone above the ore body	29
Waste rock	Siltstone, sandstone, and dolerite units within granite ore body	5
Low grade ore/ mineralised waste	Volcanics, metasediment, and late granite with siltstone within or below the orebody	8
Ore body/ mineralised waste	Biotite granite, usually with xenoliths and occasional metasediment	36
	Total individual samples	**81**

2.1.2 Stage 1 mine material ME composites

For detailed multi-element (ME) testing, RGS composited mine material samples (n=11) on the basis of lithology, material type, and geochemical classification (**Section 3.1**). Mine material ME composites are labelled C01 to C11 and are shown in **Table 2-4**. The Stage 1 analysis program for the mine material samples is provided in **Section 2.2**.

Table 2-4: Stage 1 mine material ME composites

RGS composite number	Material type / classification	Number of samples in composite
C01	Soil	3
C02	Overburden - Claystone	15
C03	Overburden - Sandstone	10
C04	Overburden - Siltstone	4
C05	Waste rock - dolerite + metasediments	5
C06	Low grade ore - NAF-B	6
C07	Low grade ore - PAF	2
C08	Ore body - NAF-B/NAF/Unc	8
C09	Ore body - PAF-LC/Low S	11
C10	Ore body - PAF/Mod S	12
C11	Ore body - PAF/High S	5
	Total individual samples	**81**

2.1.3 Stage 1 tailings sample program

The first representative tailings were received on 15th October 2024 by RGS. These materials were produced from metallurgical test studies performed in China as an early bench scale study. The sulfur grade from the initial pilot plant feed was not tested, however, the average graphite grade was 6.35 % TGC. This grade is typical for Esmeralda ore as demonstrated by assay data presented in **Section 1.5.3** and **Attachment M**.

The key reagents involved in the tailings processing were turpentine and diesel. Turpentine is a processed form of terpenic oil (or pine oil), which functions as a flotation frother. This surfactant creates a bubble-rich foam that acts as a buoyant medium to separate graphite ore from the gangue (waste rock) material. Turpentine is natural, cost-effective reagent suitable for more rudimentary test work. By contrast, diesel acts as a non-polar oily collector that enhances surface hydrophobicity and improves particle-bubble attachment. Note that turpentine is highly non-polar and is essentially insoluble in water, while being highly soluble in organic solvents and oils (such as diesel).

The process steps in the flotation-collection circuit used by Graphinex are shown in **Figure 2-1**. This process diagram applies to both the Batch 1 tailings and the Batch 2 tailings (described in **Section 2.1.5**).

In total, 16 individual samples were received, which ranged in mass from 0.026 kg to 1.28 kg. The approximate proportion of tailings from each float were Rougher Tails 1 (~1.3 kg), Cleaner 1 Tailings (~0.2 kg), and Cleaner 2 Tailings (~0.02 kg) (**Figure 2-1**). Graphinex has advised that each tailings float has slightly different processing methods in terms of grinding / particle size (results in **Section 3.3.2**).

As some of the masses were too small for the initial screen testing, it was decided that the Batch 1 tailings samples would be composited together by float number (i.e. Float #14 to Float #18) to represent the bulk tailings material before analysis (**Table 2-5**). RGS was required to use all of the available tailings sample mass for testing, and therefore, based on mass, the composites are approximately Rougher Tails (86%), Cleaner 1 Tailings (13%), and Cleaner 2 Tailings (1%). The early tailings were regarded as 'Batch 1' and all were received as dry material, therefore, did not include any supernatant liquor. The Batch 1 tailings underwent static geochemical testing as composite samples (**Table 2-5** and **Section 2.2.1**)

Additional 'Batch 2' tailings were produced from later metallurgical test studies performed in China, demonstrating a refinement of the processing method. These samples were expected to have a larger mass, which would allow for a greater range of geochemical and physical analyses to better satisfy the regulatory requirements. These samples were tested as part of the Stage 2 scope of work (**Section 2.1.5**).

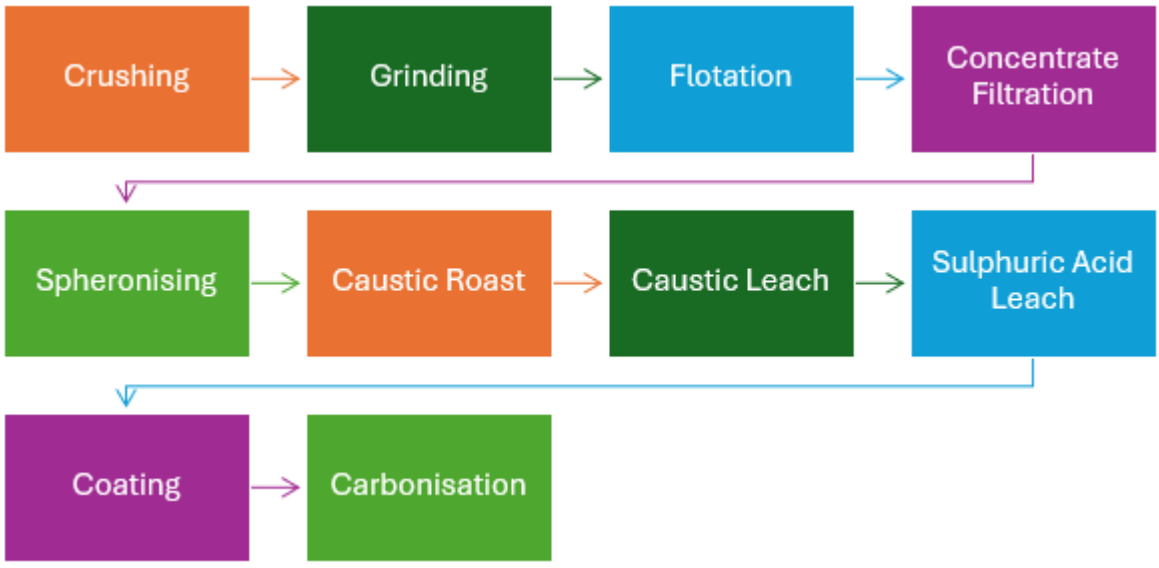


Figure 2-1: Tailings processing flow chart for the Esmeralda project

2.1.4 Stage 1 tailings composites

The Batch 1 tailings were composited by float number, and rougher tail, cleaner 1 tail, and cleaner 2 tail. The float numbers represented slightly different processing methods in terms of grinding and chemical additives (**Table 2-5**).

Table 2-5: Stage 1 tailings composite summary

RGS composite number	Description	Number of samples in composite
C101	Tailings Float #14	3
C102	Tailings Float #15	3
C103	Tailings Float #16	3
C104	Tailings Float #17	3
C105	Tailings Float #18	4
	Total individual samples	**16**

2.1.5 Stage 2 tailings sample program

Additional tailings samples (Batch 2) were later supplied by Graphinex on 28th March 2025 for the kinetic test program, as the sample mass from Batch 1 was sufficient only for static testing. The Batch 2 tailings were produced from a feed made from composite of ore materials from five drill holes (24ESD0018, 24ESMD001, 24ESMD002, 24ESD004, and 24ESMD005) (**Figure 1-5**). Drill hole information and sulfur assay data from these holes is presented in **Table 7-2** and **Table 7-3** (**Attachment M).** The average total S (measured by combustion/furnace method) from the feed ore is 1.5 %. (Note: Total S results of 2 % in **Figure 3-3** will include contribution from process reagents).

The Batch 2 tailings samples were processed in a metallurgical facility in China and were supplied to RGS in three large tanks as a slurry (**Figure 2-2**). Each tank (including supernatant) had a mass of between 52 to 55 kg (**Table 2-6**). Both the supernatant and the solid portion of the Batch 2 tailings were included in the geochemical assessment.

The Batch 2 tailings used methyl isobutyl carbinol (MIBC) as the frother or flotation reagent, and diesel as the collection agent. MIBC is a synthetic but highly selective, fast acting frother and together with diesel represents a highly efficient frother-collector combination. It is applied in coal and graphite flotation process circuits due to its high recovery rate, better selectivity, and faster kinetics compared to turpentine. MIBC produces a less sticky froth, whereas turpentine produces a more stable, tenacious froth. MIBC has limited solubility in water, allowing it to remain stable in aqueous mixtures, although it is also soluble in organic solvents and oil. It is therefore expected that the Batch 2 supernatant will contain some dissolved MIBC. Static hydrocarbon results are presented in **Section 3.1.10** and kinetic results in **Section 3.4.3**.

Details regarding the processing are shown in **Figure 2-1**, and the three samples are assumed to represent the same processing stream.

Table 2-6: Stage 2 tailings samples

Tailings sample	Matrix	Mass	RGS ID	Supernatant TSS
1	Slurry	55 kg	2024066_001	1,970 mg/L
2	Slurry	52 kg	2024066_002	380 mg/L
3	Slurry	55 kg	2024066_003	13 mg/L

TSS = Total suspended solids

The Batch 2 tailings samples were allowed to settle for two days, and then the liquid portion (supernatant) was decanted off (**Figure 2-2**). The three samples did not settle equally, and the total suspended solids (TSS) remaining in the supernatant are listed in **Table 2-6**. Decanted supernatant was sent to a laboratory, (ALS, Stafford) for TSS testing. Results indicate that tailings from tank 1 were much higher in TSS compared to tank

3. The supernatant was also geochemically assessed for major and trace elements, and results are presented in **Section 3.1.9**.

The solid portion of the tailings samples was then dried in an oven at 80 ºC before undergoing analysis. The dry mass of tailings from each tank was approximately 7 to 10 kg.

The Batch 2 tailings underwent static geochemical testing as individual samples (**Section 2.2.2**) and kinetic geochemical testing as a single composite to represent the bulk tailings material (**Table 2-8**).



Figure 2-2: Batch 2 tailing samples as received

2.1.6 Stage 2 mine material and tailings KLC composites

The mine material KLC composite samples were constructed by material type, as listed in **Table 2-7**. Refer to **Table 2-3** and **Table 2-4** for a description of material types and ME composites.

Table 2-7: Stage 2 mine material KLC composites

Mine material type	Samples in KLC composite	Geochemical classification*	RGS ID	KLC mass
Soil	C01	NAF-B	2024066_KLC 1	4 kg
Overburden	C02 + C03 + C04	NAF-B/ NAF	2024066_KLC 2	4 kg
Waste rock	C05	NAF-B	2024066_KLC 3	4 kg
Low grade ore/ mineralised waste	C06 + C07	Mostly NAF-B, some PAF	2024066_KLC 4	4 kg
Ore body/ mineralised waste	C08 + C09 + C10 + C11	Mostly PAF, some NAF-B/ NAF	2024066_KLC 5	4 kg

The Stage 2 tailings KLC composite (C106) was created by combining 2 kg of dry mass from each Batch 2 tailings sample as described in **Table 2-8**.

Table 2-8: Stage 2 tailings KLC composites

Tailings sample	Mass	Geochemical classification*	RGS ID	KLC mass
1	2 kg	Uncertain / PAF	2024066_C106	6 kg total dry mass Split half into KLC 6 and half into KLC 7 (3 kg each column)
2	2 kg			
3	2 kg			

*Based on results presented in **Section 3.1**.

2.1.7 Stage 2 KLC set-up

Dry sample composites of mine material (crushed to <20 mm) or tailings were used in each column. Samples masses are provided in **Table 2-7** and **Table 2-8** and range from 3 to 4 kg. The KLC set-up used by RGS is shown in **Figure 2-3** and utilised custom-built Perspex columns that can be operated under a free leaching or saturated moisture regime. In between leach events, the free draining columns were allowed to dry, while the saturated column remained inundated over the entire test period.

Under a free leaching column regime, 1 L of de-ionised water was added and held in the column with a closed tap for 24 hours, before being released for collection. If the volume of leachate was insufficient for testing, up to 0.4 L of additional deionised water could be added. The sample was then allowed to dry. This regime simulated free oxidising conditions, such as in a waste rock dump or the top surface of a TSF. In a saturated regime, the materials are kept inundated under water and are not allowed to dry. An Eh meter is inserted to monitor the redox conditions of the water (**Table 3-26**). As long as the conditions are reducing, the redox potential (measured in mV) was negative. This simulated anoxic conditions, such as at depth within a backfilled void under the groundwater table, or an in-pit TSF with an aqueous cover.

The materials were subjected to seven monthly leach events from April 2025 to October 2025 (**Table 2-9**). At the end of this test period, it was decided that an extended KLC program would be undertaken, which began in December 2025 and was completed in June 2026. The total KLC test program involves fourteen monthly leach events.

The analysis suite for the Stage 2 KLC test program is presented in **Section 2.2**.

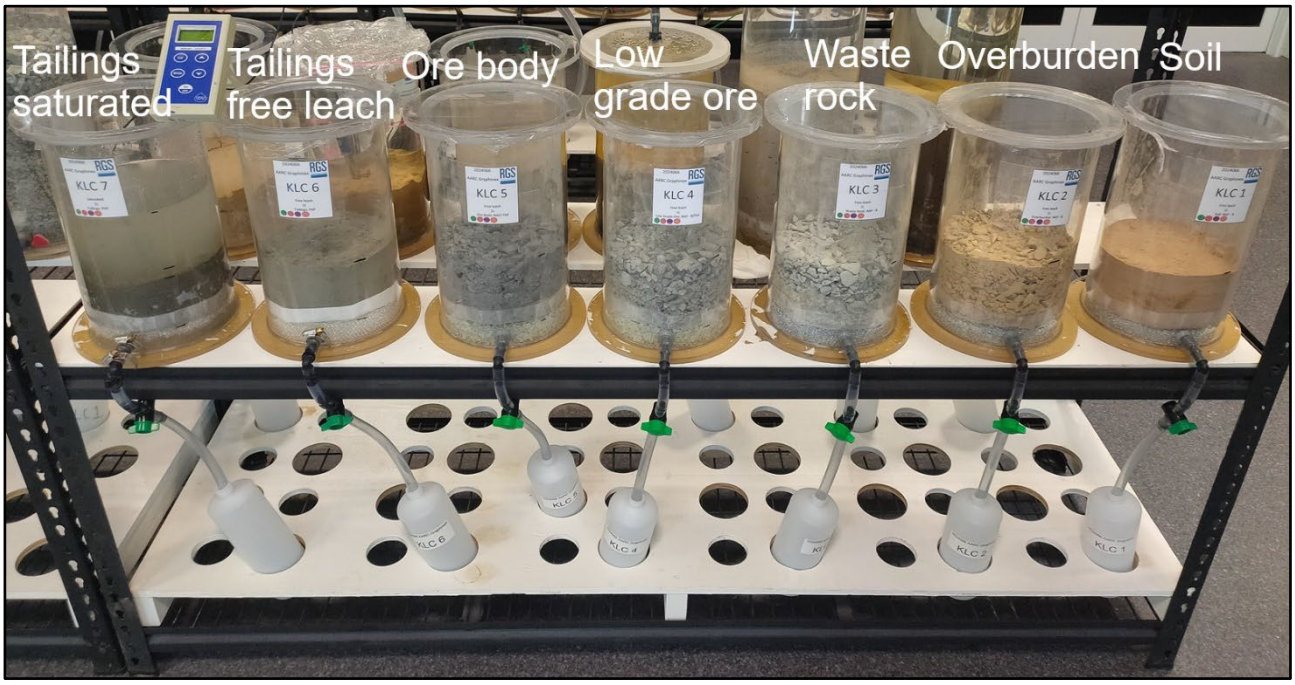


Figure 2-3: Graphinex KLC set-up

Table 2-9 : Stage 2 KLC leaching regime

Date of leach event	KLC 1	KLC 2	KLC 3	KLC 4	KLC 5	KLC 6	KLC 7
	Free leach						Saturated
17/04/2025	✔	✔	✔	✔	✔	✔	✔
15/05/2025	✔	✔	✔	✔	✔	✔	✔
11/06/2025	✔	✔	✔	✔	✔	✔	✔
10/07/2025	✔	✔	✔	✔	✔	✔	✔
07/08/2025	✔	✔	✔	✔	✔	✔	✔
04/09/2025	✔	✔	✔	✔	✔	✔	✔
02/10/2025	✔	✔	✔	✔	✔	✔	✔
17/12/2025	✔	✔	✔	✔	✔	✔	✔
21/01/2026	✔	✔	✔	✔	✔	✔	✔
1/02/2026	✔	✔	✔	✔	✔	✔	✔
18/03/2026	✔	✔	✔	✔	✔	✔	✔
16/04/2026	✔	✔	✔	✔	✔	✔	✔
14/05/2026	✔	✔	✔	✔	✔	✔	✔
11/06/2026	✔	✔	✔	✔	✔	✔	✔
Summary	14 x monthly leach events **Fourteen month duration**						

2.2 Analysis program

2.2.1 Stage 1 static geochemical and physical analysis program

To characterise the acid producing and/or acid consuming potential of mine materials and tailings from the Esmeralda Project, a range of initial screening analyses were completed. Samples were subjected to a standard Acid Base Account (ABA) suite of analyses. This included the determination of pH, EC, total sulfur, ANC and NAPP. Sulfide sulfur was measured on selected individual samples with greater than >0.1 % total sulfur. Composite samples were then selected/prepared and subjected to further geochemical analyses such as acidity/alkalinity, and soluble metals/metalloids in static leach (shake flask extraction) tests. Selected physical testing was performed on the Batch 1 tailings but was limited by sample mass. Further physical testing was conducted on the Batch 2 tailings.

Table 2-10provides the static geochemical analytical suite, as well as their method codes. For reference, composites include mine materials (n=11) and Batch 1 tailings (n=5).

Table 2-10: Stage 1 static geochemical and physical analytical program

Static geochemical analyses	ALS Code	Method Code	Individual samples	Composites
pH and EC (1:5 w:v)	EA02 and EA010	APHA 4500 H+ - B and APHA 2510 B	81	5
NAPP (includes ANC, Total S)	ASS1	III. Coastech Research (Canada)	81	5
Chromium Reducible Sulfur (22B)	EA026	Ahern et al (2004)	35	5
Major, minor and trace elemental analysis (Total) including major cations	EG020T - 2 acid aqua regia digest	USEPA 6020 ICP/MS		11+5
1:5 sample: water leach for water soluble elements	ALS Code	Method Code	Individual samples	Composites
Leach method (1:5 w:v 16 hours)	EN35	---		11+5
Alkalinity: including Bicarbonate, Carbonate, Hydroxide & Total as $CaCO_3$	ED037	APHA 2320 B		11+5
Acidity as $CaCO_3$	ED038	APHA 2310 B		11+5
Cations - Dissolved: Calcium, Magnesium, Sodium, Potassium + Anions: Major (Cl, SO_4, Alkalinity), Fluoride	NT-1 & NT-2	APHA 3120B, APHA 3125B		11+5
Dissolved trace metals by ICP/MS (including digestion) (0.45 µm filter)	EG020F	USEPA 6020 ICP/MS		11+5
Mineralogy	X-Ray Vision	Method Code	Number of samples	
Mineralogy by X-Ray Diffraction with clay analysis	XRD			11+5
Physical testing	Laboratory	Method Code	Number of samples	
Bulk density	ALS			5
Particle size distribution with hydrometer	ALS			5
Column settlement	RGS			5
Soil water characteristic curves	BioTrack			5

2.2.2 Stage 2 tailings static geochemical analyses

Prior to KLC testing, it was required that the Batch 2 tailings samples (n=3), undergo static geochemical testing to verify their characteristics. The solid tailings samples were subjected to a standard ABA analysis suite. The individual samples of solid and supernatant were also subjected to further geochemical analyses such as acidity/alkalinity, metals in whole rock and soluble metals/metalloids in a static leach (shake flask extraction) test.

Table 2-11 provides the static geochemical analytical suite for tailings, as well as the ALS method codes.

Table 2-11: Stage 2 tailings static geochemical analytical program

Static geochemical analyses	ALS Code	Method Code	Solid samples	Supernatant samples
pH and EC (1:5 w:v)	EA02 and EA010	APHA 4500 H+ - B and APHA 2510 B	3	-
NAPP (includes ANC, Total S)	ASS1	III. Coastech Research (Canada)	3	-
Chromium Reducible Sulfur (22B)*	EA026	Ahern et al (2004)	3	-
Major, minor and trace elemental analysis (Total) (2-acid digest) (50 elements)	ME-MS41	USEPA 6020 ICP/MS	3	-
EK040T: Fluoride – Total as Solids	EK040T	EK040T In-house Fusion	3	-
Total Carbon (TC) in soil	EP003TC	AS 1289.4.1.1-1997/ NEPM	3	-
Net Acid Generation (NAG)	EA011	AMIRA (2002)	3	-
1:5 sample: water leach for water soluble elements	**ALS Code**	**Method Code**	**Solid samples**	**Supernatant samples**
Leach method (1:5 w:v, 16 hour)	EN35	---	3	-
pH and EC	EA02 and EA010	APHA 4500 H+ - B and APHA 2510 B	3	3
Alkalinity: including Bicarbonate, Carbonate, Hydroxide & Total as $CaCO_3$	ED037	APHA 2320 B	3	3
Acidity as $CaCO_3$	ED038	APHA 2310 B	3	3
Cations – Dissolved: Calcium, Magnesium, Sodium, Potassium + Anions: Major (Cl, SO_4, Alkalinity), Fluoride	NT-1 & NT-2	APHA 3120B, APHA 3125B	3	3
ME-O2: (Filtered at 45 um) ICP-MS Full scan	ME-02	USEPA 6020 ICP/MS	3	3
EG035F: Mercury	EG035F	APHA 3112 Hg-B CV/FIMS	3	3
EP005: Organic Carbon Total (TOC) in leach	EP005		3	3
TRH (C10-C40) in leach	EP071	USEPA SW 846 - 8260B	3	3

2.2.3 Stage 2 tailings physical analyses

Physical analyses of the Batch 2 tailings were undertaken to fill some of the data gaps from the Batch 1 tailings assessment, that could not be completed due to the limited sample mass. The physical testing program is outlined in **Table 2-12**.

The physical stability of the tailings determines how they will behave when they are placed into waste storage areas. The Department of Environment, Training, Science and Innovation (DETSI) generally requires physical analysis for process residues to verify how they will perform in a void or TSF, and these characteristics are required to ensure that the final rehabilitated landform is safe, stable, and non-polluting.

Table 2-12: Tailings physical analysis program

Physical parameter	Laboratory	Solid individual tailings samples	Solid composite tailings samples
Emerson Class No.	ALS	3	
Bulk density	ALS	3	
Particle size distribution (PSD) 4.75 to 0.001 mm	ALS	3	
Soil Particle Density	ALS	3	
Atterberg Limits	Trilab	3	
Permeability	Trilab		1
SWCC (water retention)	BioTrack		1

2.2.4 Stage 2 kinetic geochemical analyses

Leachate collected from the seven KLC of mine materials and tailings was analysed at ALS for the parameters outlined in **Table 2-13**. The test program included a suite of major, minor, and trace elements, as well as alkalinity, acidity, organic carbon, and medium to long chain hydrocarbons. Short chain hydrocarbons (<C10) were assumed to be volatile.

Each KLC was leached fourteen times, resulting in a total of 98 analyses overall. The KLC program and leach event dates are provided in **Table 2-9**.

Table 2-13: Stage 2 mine material and tailings KLC analysis program

Kinetic Leach Column testing	ALS Code	Method Code	Number of samples
pH and EC	EA005P + EA010P	APHA 4500 H+ - B and APHA 2510 B	7 KLC x14 leach events
Acidity as $CaCO_3$ only	ED038P $CaCO_3$	APHA 2310 B	
Cations - Dissolved: Calcium, Magnesium, Sodium, Potassium	NT-01	APHA 3120B, APHA 3125B	
Anions: Major (Cl, SO_4, Alkalinity), Fluoride	NT-02A	APHA 3120B, APHA 3125B	
Trace metals by ICP/MS (including digestion)	EG020F	USEPA 6020 ICP/MS	
Mercury	EG035F	APHA 3112 Hg-B CV/FIMS	
Total Organic Carbon (TOC)	EP002		
TRH (C10-C40) in leach	EP071	USEPA SW 846 - 8260B	
Ionic Balance	EN055	Included with NT-1 and NT-2	

3 Results

3.1 Static geochemistry

The Acid Base Account (ABA) results for the 81 drill core samples representing mine materials at the Project are provided in **Table B-1** (**Attachment B**) and summarised below. An explanation of the methodology used in this section, including a description of the ABA screening method, is provided in **Attachment A**. Samples have been ordered by material type and sulfur content for ease of interpretation.

3.1.1 pH

The pH value for the mine material samples ranges from slightly acidic (pH 5.0) for a single soil sample to alkaline (pH 9.8) and has slightly alkaline median value of pH 8.9 (**Figure 3-1**). Tailings are typically alkaline i.e., Batch 1 tailings are pH 8.4 to 8.7 and Batch 2 tailings are pH 8.2 to 8.3.

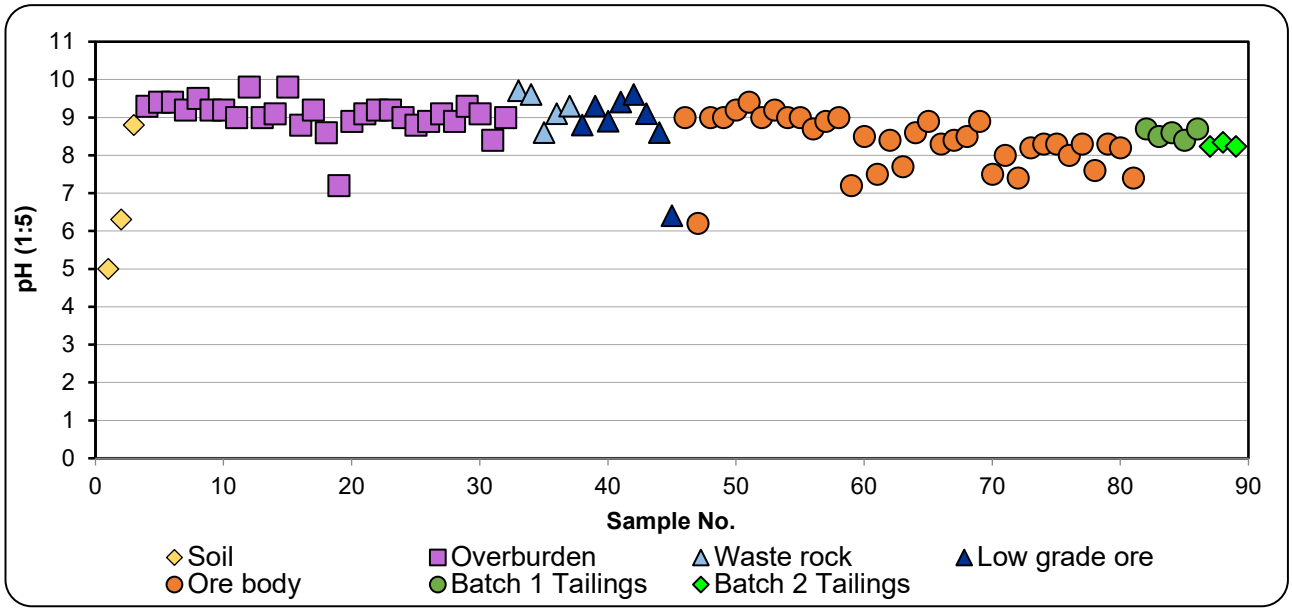


Figure 3-1: pH of mine material and tailings samples

3.1.2 Electrical conductivity

The electrical conductivity (EC) value for the mine material samples ranges from a very low (5 µS/cm) to slightly brackish (1,760 µS/cm). The median EC was a low 131 µS/cm and initial contact water would be expected to be relatively fresh. Some samples with higher EC values were recorded within the overburden and ore body (**Figure 3-2**). The Batch 1 tailings produce very low salinity (112 to 160 µS/cm), while the Batch 2 tailings are slightly higher (341 to 392 µS/cm).

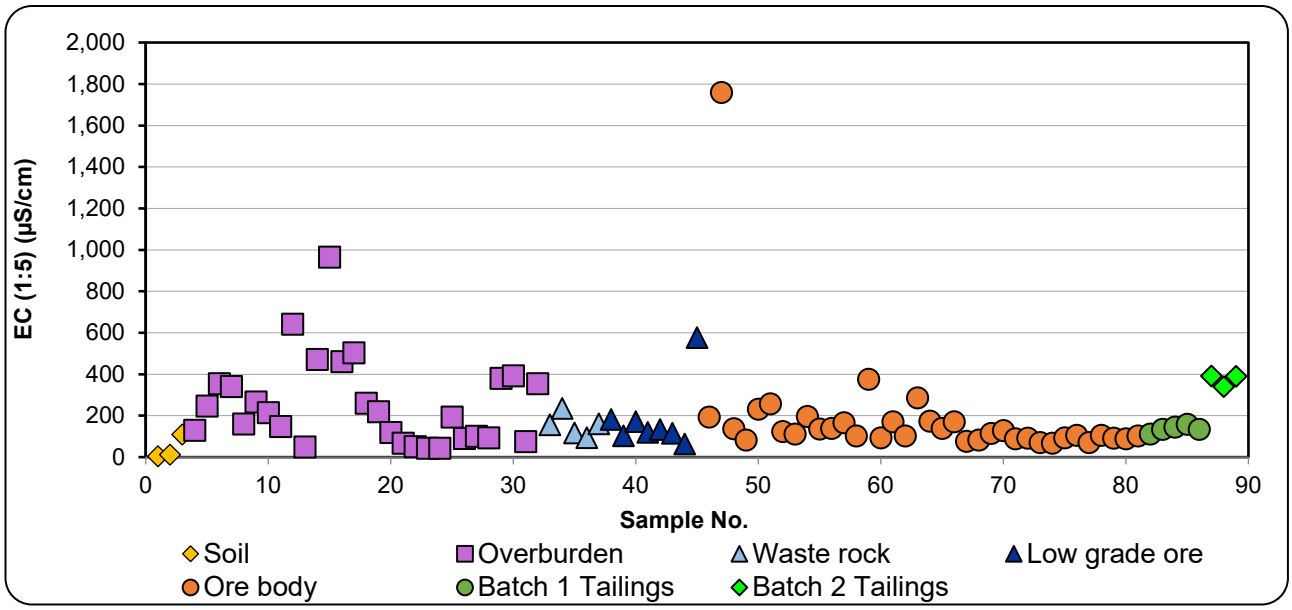


Figure 3-2: EC of mine material and tailings samples

3.1.3 Total sulfur

The total sulfur concentration in the mine material samples ranges from <0.01 to 3.53 %S with a median value of 0.05 %S. The total sulfur content in the ore body is higher compared to the other sample types (**Figure 3-3**). The total sulfur content of the Batch 1 tailings ranges from 1.42 to 1.51 %S, while the Batch 2 tailings are 1.89 to 1.96 %S.

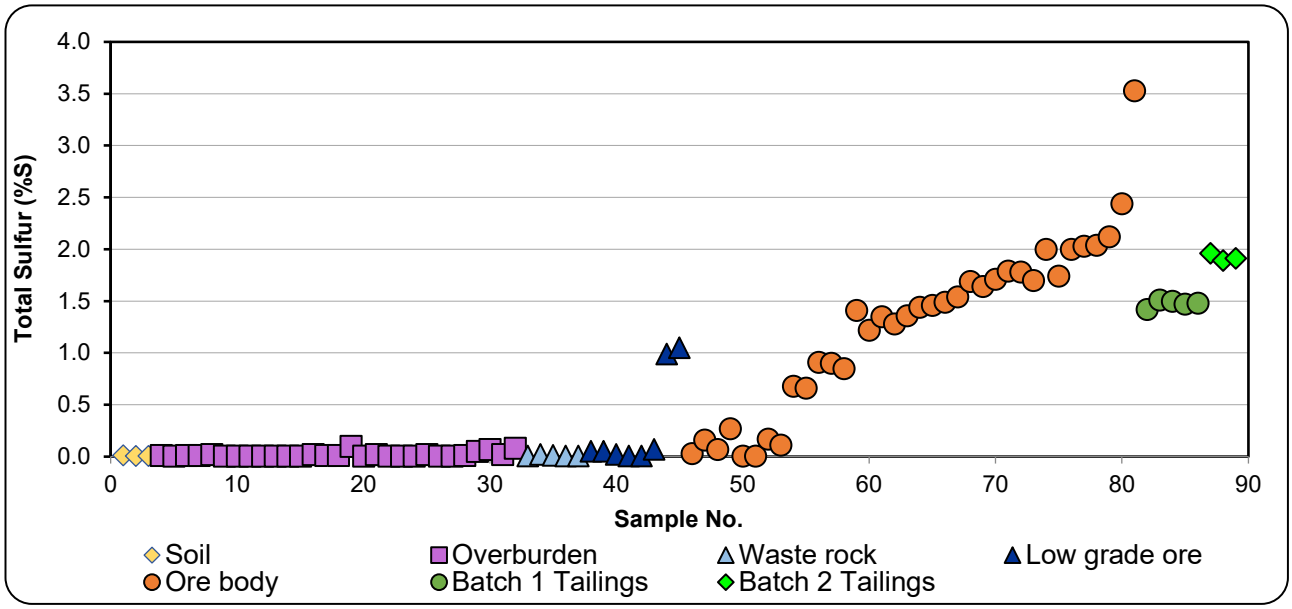


Figure 3-3: Total sulfur of mine material and tailings samples

The total sulfur content is generally above 0.1 %S in the ore body, tailings, and occasional low grade ore samples. Materials with a total sulfur content less than or equal to 0.1 %S are essentially barren of sulfur and have negligible capacity to generate additional acidity. 57 % of samples are considered barren with the remaining 43 % containing greater than 0.1 %S. Review work in **Section 1.5.3** demonstrates there is a clear relationship between total graphic carbon and sulphur content in the mineralised graphite orebody.

The total sulfur content of some of the ore body, tailings, and low grade ore samples is greater than 0.1 %S, however, this does not necessarily mean that the samples have any potential to generate acid. Sulfide-bearing minerals are the primary source of acidity. The chromium reducible sulfur (Scr) method measures the sulfide sulfur content or un-oxidised portion of sulfur (e.g., pyrite) that is reactive. Scr was measured on all samples with >0.1 %S and ranged from 0.1 to 3.5 %Scr (**Figure 3-4**).

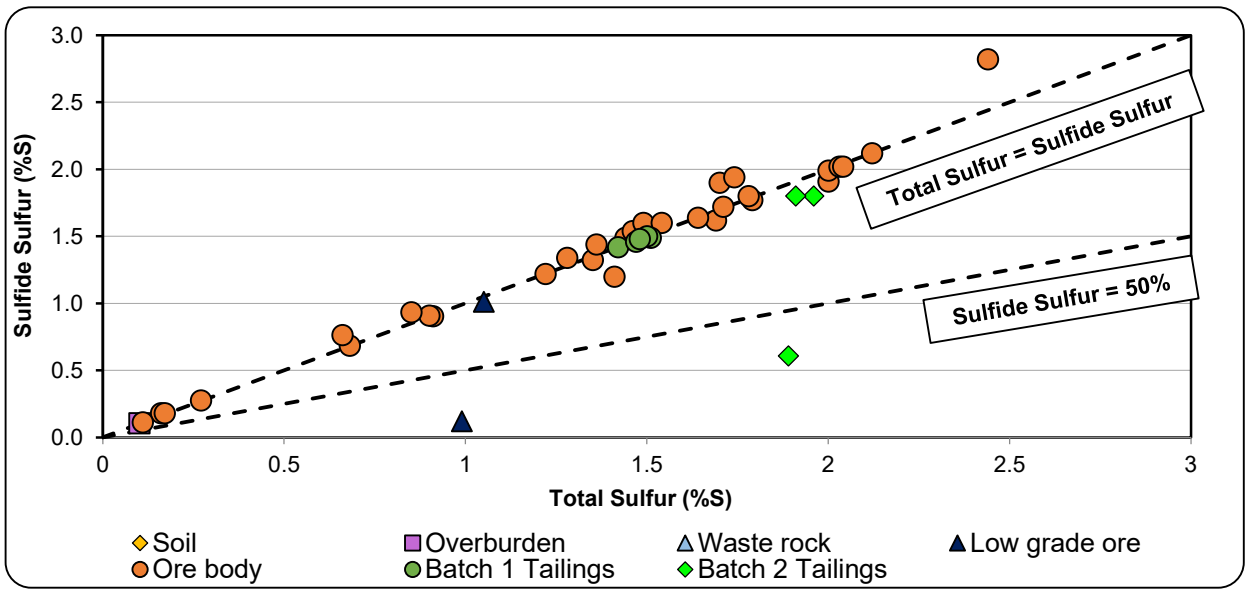


Figure 3-4: Relationship between total sulfur and sulfide sulfur

The results indicate that for samples with greater than 0.1 %S (n=39), the proportion of Scr is close to the total sulfur value and the majority of samples plot close to the 'total sulfur = sulfide sulfur' line. Exceptions include one low grade ore sample, which has 0.99 %S and 0.12 %Scr. This sample plots close to the x axis and is likely to contain non-sulfide forms of sulfur, such as sulfate sulfur (e.g., gypsum, $CaSO_4$) or organic S. Similar characteristics were noted in a Batch 2 tailings sample, which had 1.89 %S and 0.61 %Scr.

3.1.4 Total carbon

The total carbon content from the mine material samples ranges from 0.01 to 19.5 % with a median value of 1.8 % (**Figure 3-5**). The total carbon content in the ore body is higher compared to the other sample types and has a strong correlation to the total sulfur content. The total carbon of the Batch 1 tailings ranges from 0.9 to 2.1 %, while the Batch 2 tailings are 0.5 to 0.8 %, indicating an improvement in carbon (as graphite) recovery.

The results in **Table 3-1** demonstrate that total carbon is highest in the ore body materials, as would be expected in a graphite deposit. The second highest concentration is in low grade ore, followed by tailings. Other mine materials have relatively low concentrations of total carbon.

Table 3-1: Summary of total carbon results in solids for mine materials and tailings

Material type	No. samples	Total Carbon (%)		
		Min	Max	Median
Soil	3	0.1	0.2	0.1
Overburden	29	0.01	2.3	0.04
Waste rock	5	0.1	1.3	0.3
Low grade ore	8	0.02	3.0	1.6
Ore body	36	1.8	19.5	6.6
Tailings (Batch 1+2)	8	0.5	2.1	0.9

A total carbon testing suite (including total, organic, and inorganic carbon) was performed on the three Batch 2 tailings supernatant samples. The total carbon concentration was 74 to 80 mg/L, which was comprised of relatively equal proportions of inorganic carbon (37 to 39 mg/L) and organic carbon (39 to 48 mg/L).

Approximately 90 % of the organic carbon was dissolved into solution, based on total carbon results for solid tailings (**Table 3-1**). As the proportion of carbonate (CO_3) minerals is low in tailings, it is likely that most inorganic carbon is graphite (C), and most organic carbon is from flotation reagent.

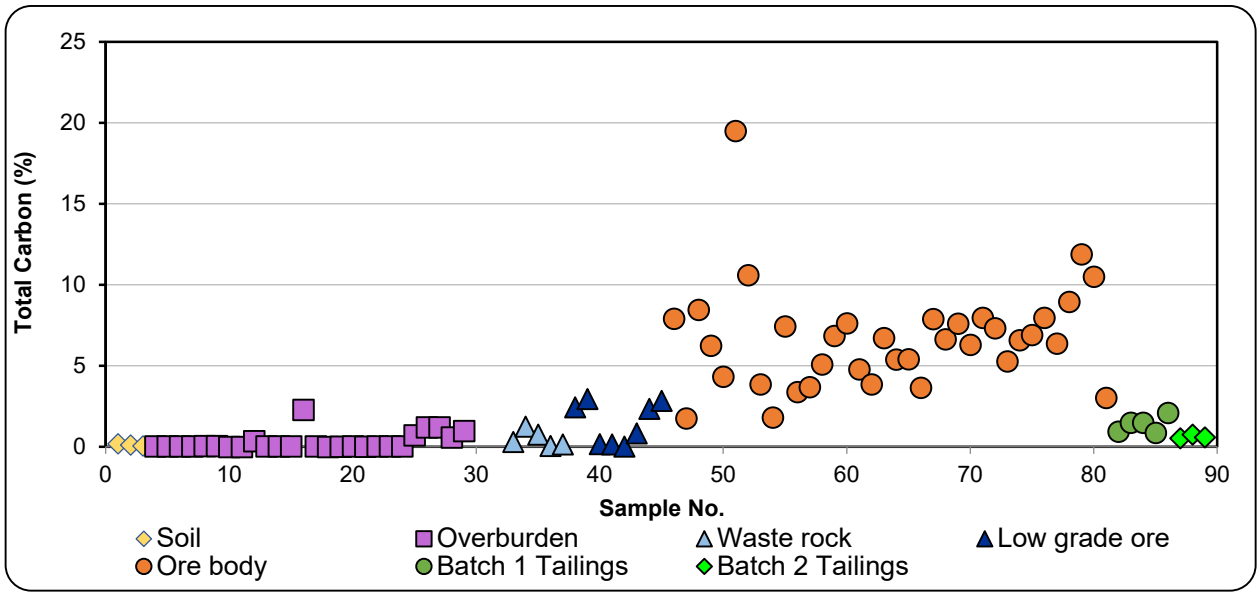


Figure 3-5: Total carbon of mine material and tailings samples

3.1.5 Acid Neutralising Capacity and Maximum Potential Acidity

Based on the total sulfur content, the Maximum Potential Acidity (MPA) could be generated of the mine materials from the mine materials and tailings samples have been calculated. The MPA ranges from 0.2 to 107.8 kg H_2SO_4/t; and has a low median value of 2.1 kg H_2SO_4/t.

The Acid Neutralising Capacity (ANC) measures the amount of acid (as kg H_2SO_4 /t) that could be neutralised by acid neutralising minerals present in the sample materials. The ANC for the samples ranges from 0.3 to 113.0 kg H_2SO_4/t and has a median value of 8.7 kg H_2SO_4/t (**Figure 3-6**). Low grade ore and waste rock typically have slightly higher ANC than other material types, although occasional samples within the ore body and overburden can also have higher ANC values.

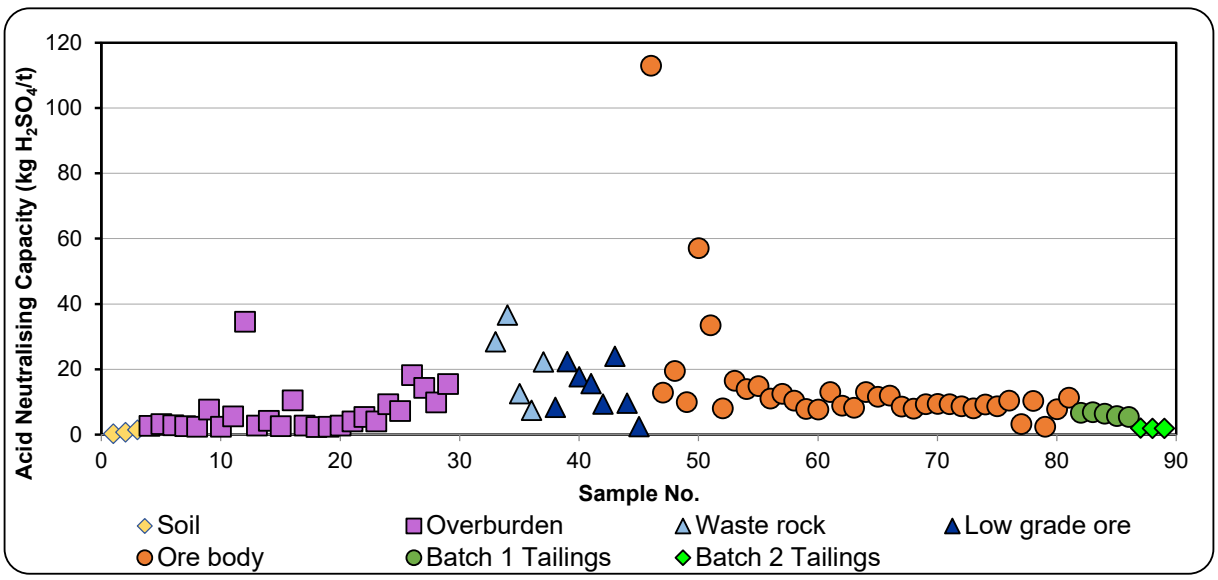


Figure 3-6: ANC of mine material and tailings samples

The ANC:MPA ratio measures the proportion of ANC present in the sample compared to the MPA. If the ANC:MPA = 3 or greater, there is an excess of ANC which is likely to buffer any acid produced and there is generally negligible risk of acid generation. If the ANC:MPA ratio is less than 1, there are equal or lesser proportions of ANC compared to MPA, and there may be insufficient ANC to neutralise the MPA, and therefore materials represented by the samples may have some overall risk of generating acid.

The ANC:MPA ratio for the samples ranges from 0.04 to 372.9 and has a median value of 3.8 (**Figure 3-7**).

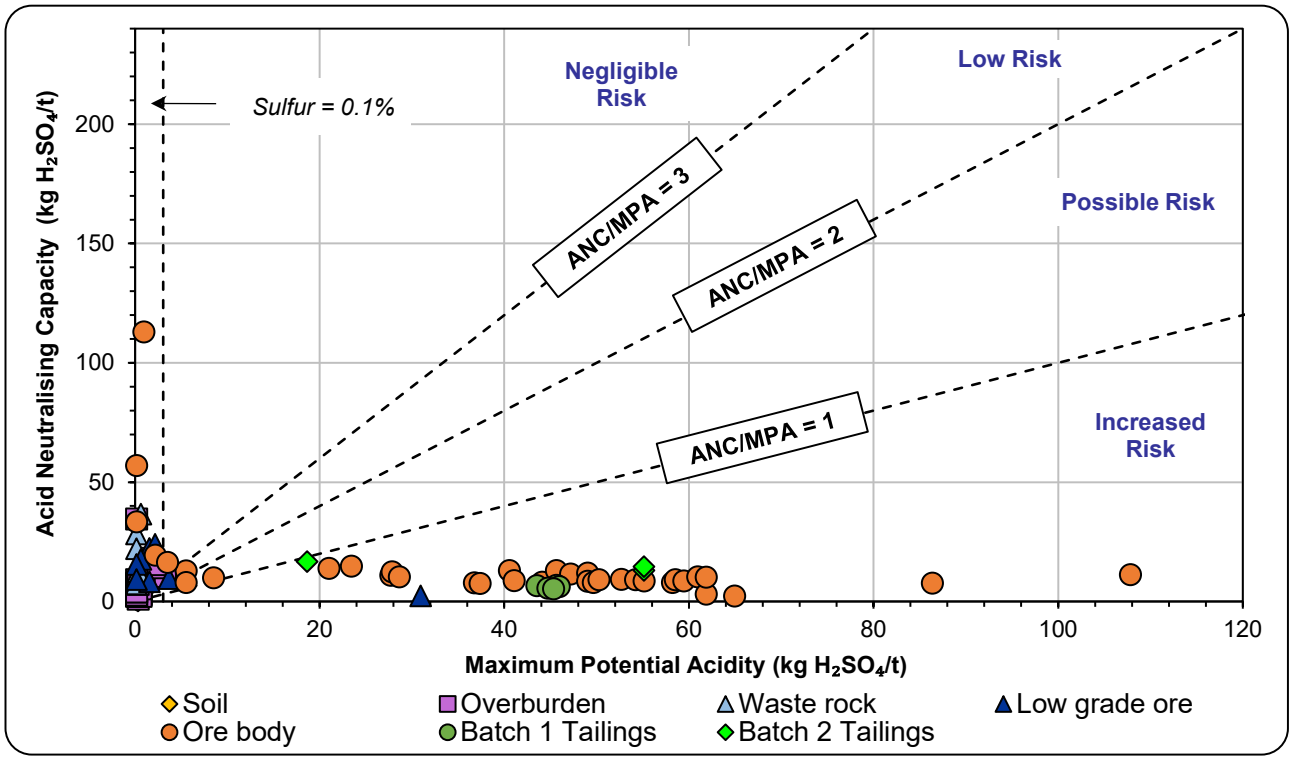


Figure 3-7: Relationship between MPA and ANC

3.1.6 Net Acid Production Potential

The NAPP is the balance between the capacity of a sample to generate acidity (MPA) minus its capacity to neutralise acidity (ANC). The calculated NAPP value for the mine material samples ranges from -112 to +97 kg H_2SO_4/t (**Figure 3-8**). Based on total sulfur values, the majority of samples within the ore body and all tailing samples produce positive NAPP values. Materials within the waste rock and low grade ore typically produce negative NAPP values, while soil and overburden produce NAPP values that are either negative or close to zero. The NAPP results verify that soil, overburden, waste rock, and the majority of low grade ore materials will add alkalinity to surface runoff and seepage.

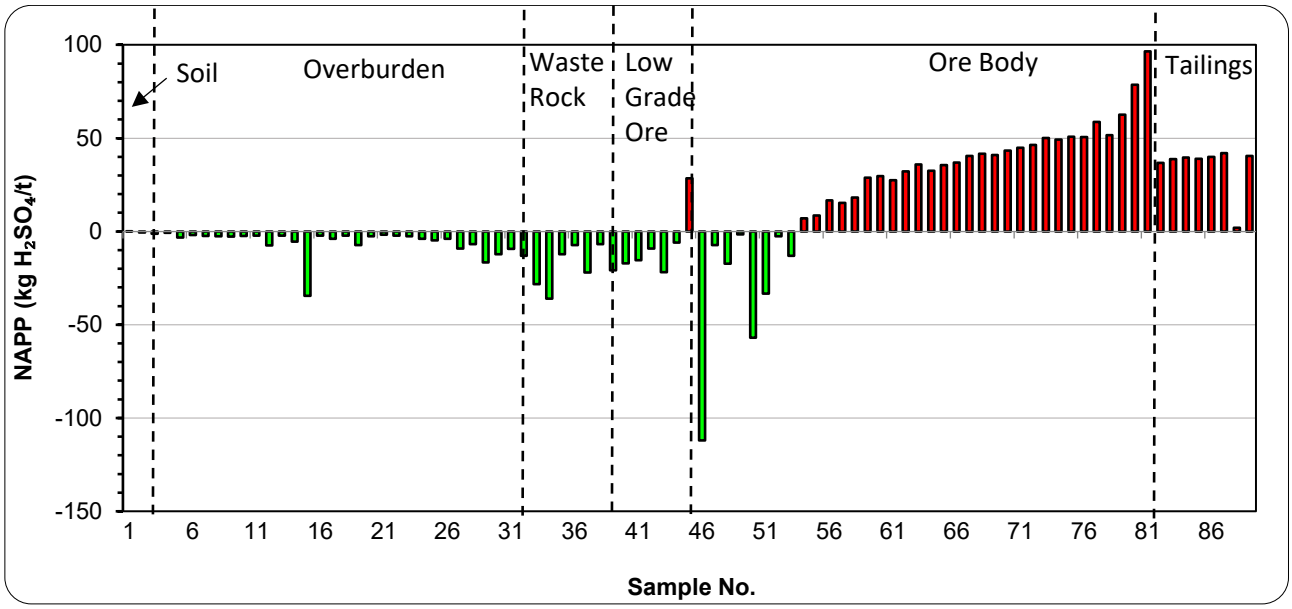


Figure 3-8: NAPP of samples from the Esmeralda Project

3.1.7 Net Acid Generation

The net acid generation (NAG) test involves the addition of hydrogen peroxide to a sample to oxidise reactive sulfide, then measurement of pH and titration of any net acidity produced by the acid generation and neutralisation reactions occurring in the sample. Eleven (11) mine material composites and 8 tailings samples underwent NAG testing (**Figure 3-9**).

A final NAG_{pH} < 4.5 generally indicates that the sample is potentially acid forming (PAF) and the test provides a direct measure of the net amount of acid remaining in the sample after all acid generating and acid neutralising reactions have taken place. A NAG_{pH} > 4.5 generally indicates that the sample is NAF.

The samples were classified according to the AMIRA (2002) classification system (NAG_{pH} versus NAPP) and are displayed in **Figure 3-9.** The results indicate that the three ore body samples, and all of the tailings composites are classified as PAF. These composites all had positive NAPP values due to elevated total sulfur concentrations. One ore body sample relatively low in sulfur and a low grade ore sample relatively high in sulfur were classified as Uncertain. Other soil, overburden, waste rock, and low grade ore samples with low sulfur were classified as NAF.

NAG results are also interpreted in the mineralogical (XRD) expert report (**Attachment J**) and discussed in **Section 4**.

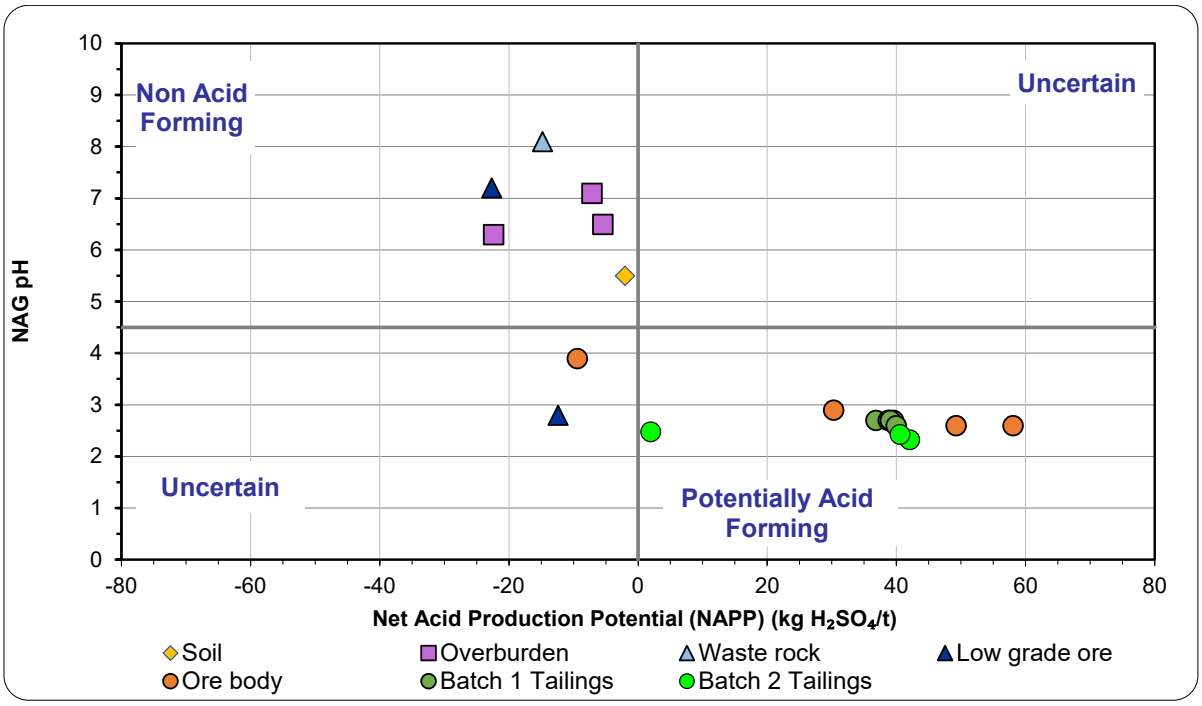


Figure 3-9: NAG and NAPP values for composite samples

3.1.8 Geochemical Classification

The ABA test data presented in **Attachment B** and discussed in this section have been used to classify the acid forming nature of the mine material and tailing samples. These classification criteria generally reflect Australian (COA, 2016) and international (INAP, 2026) guideline criteria for classification of mine materials.

Table 3-2 provides the criteria used by RGS to classify the acidic drainage potential of the samples and the number of samples in each class. Based on total sulfur values, the results indicate that 55 % of all of the mine material samples are classified as NAF-Barren (53 %) or NAF (2 %). A small proportion of the samples may have insufficient ANC to fully neutralise any acid produced and are classified as Uncertain (2 %). Some of the mine material samples are classified as PAF-LC (2 %) or PAF (39 %). RGS notes that these classifications and the proportion of PAF samples is not consistent with initial pH values (**Section 3.1.1**) or groundwater results. (**Section 1.5.1**). This is primarily due to mineralogy and the slower reactivity of pyrrhotite, as opposed to pyrite. Further kinetic work demonstrates that if left to oxidse, PAF-LC and PAF materials will eventually generate acid. The acidity release rate is investigated in **Section 3.4.**

Figure 3-10 shows the geochemical classifications for each geological unit. Overall, the risk of acid generation appears to increase with depth. Soil and overburden materials are likely to be NAF-Barren, as are waste rock materials located adjacent to the ore body. Where higher grades of total graphitic carbon are present, this typically correlates to higher total sulfur, as well as PAF classifications within the ore body and occasionally in low-grade ore. There appears to be a strong correlation between total sulfur and total carbon data in ore body materials (**Attachment M**).

Table 3-2: Sample classifications based on risk of generating acidic drainage

Classification	TS (%)	NAPP[1] (kg H_2SO_4/t)	No of Samples (n=89)	Proportion
Non-Acid Forming (Barren)[2]	≤ 0.1	-	47	53 %
Non-Acid Forming	> 0.1	< - 5	2	2 %
Uncertain	> 0.1	> - 5 to ≤ + 5	3	2 %
Potentially Acid Forming - Low Capacity	> 0.1	> + 5 to ≤ + 10	2	2 %
Potentially Acid Forming	> 0.1	> 10	35	39 %

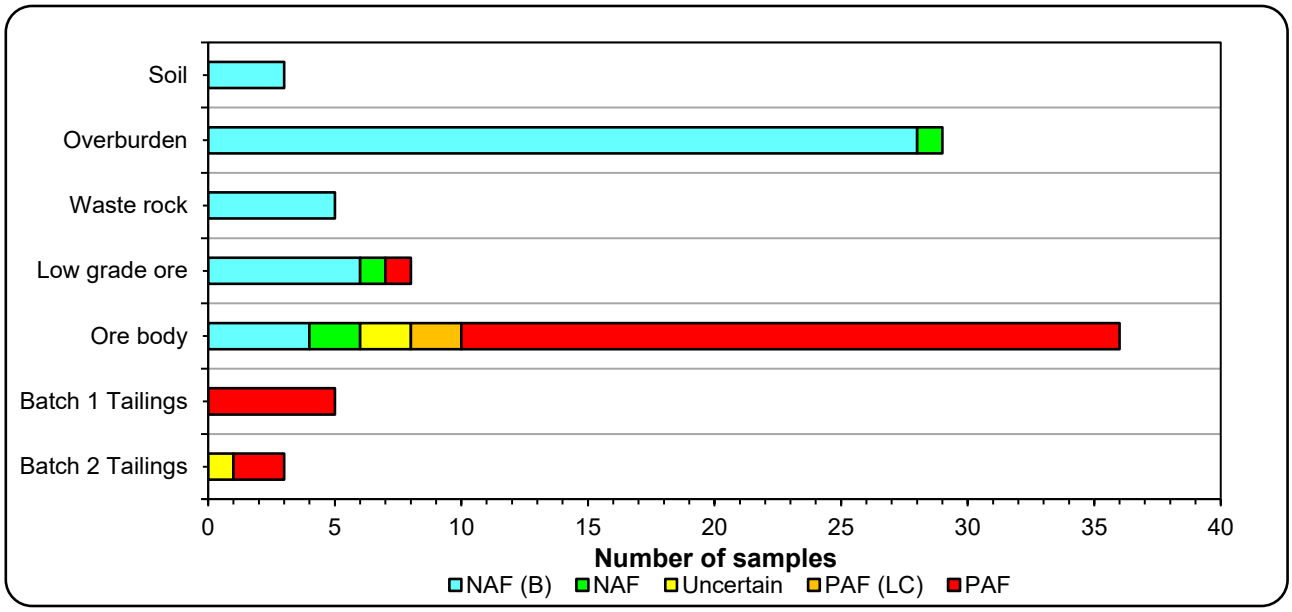


Figure 3-10: Geochemical classification for mine materials

3.1.9 Multi-element testing

3.1.9.1 Multi-element concentration in solids

Multi-element tests were completed on the three tailings solid samples. ALS laboratory certificates are provided in **Attachment E**. The work program was completed to identify major and trace elements present at concentrations of environmental concern with respect to materials handling, storage, revegetation and water quality. The results of the analysis are presented in **Table B2 (Attachment B)** and summarised herein.

To provide relevant context, the total metal/metalloid concentration in samples are compared to the National Environmental Protection Council (NEPC) Health-based Investigation Levels (HIL(C)) applied to humans for soils in public open spaces (NEPC, 2013). The results indicate that the sample materials typically have low total metal and metalloid concentrations in solids, some below the laboratory limit of reporting (LoR) and all below the applied NEPC (HIL(C)) guidelines for soils.

To provide additional context, the multi-element results were compared to the median crustal abundance of those elements in unmineralised soils (Bowen, 1979, CRC, 2000 and INAP, 2026). From this comparison, the geochemical abundance index (GAI) is calculated. The GAI value quantifies an assay result for a particular element in terms of the median crustal abundance for that element. The index, based on a log (2) scale, is expressed in seven integer increments (0 to 6), which correspond to enrichment factors from 0 to over 96 times median crustal abundance, as shown in **Table 3-3**.

Table 3-3: Geochemical Abundance Index enrichment factors

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

As a general rule, a GAI of 3 or greater signifies an enrichment that may warrant further examination. This particularly applies to some environmentally important trace elements such as arsenic, cadmium, copper, and zinc, moreso than major rock-forming elements such as calcium, magnesium, potassium, and sodium.

Elements identified as enriched may not necessarily be a concern for revegetation, drainage water quality or public health, but their significance should still be evaluated. The GAI provides an indication of metals/metalloids that may be enriched relative to the median crustal abundance, however the following points should also be considered:

- The median crustal abundance varies between different literature sources, therefore affecting the calculated GAI values.
- If a sample is shown to be enriched relative to the median crustal abundance, there is no direct correlation that that particular sample will also leach metals/metalloids at elevated concentrations. The mobility of metals and metalloids is dependent on mineralogy, adsorption/desorption and the environment in which it occurs.
- Whilst some element concentrations can be elevated relative to the median crustal abundance, the nature of a mineral deposit means the background levels may also be elevated.
- Similarly, because an element is not enriched does not mean it will never be a concern, because under some conditions (e.g., low pH) the solubility of common environmentally important elements such as Al, Cu, Cd, Fe and Zn increases significantly.

The GAI results indicate that majority of the metals/metalloids tested in the mine material and tailings composite samples have GAI values less than 3 compared to median crustal abundance. The exceptions are tellurium (Te), rhenium (Re), sulfur (S), molybdenum (Mo), and copper (Cu) which have slight enrichment, especially in the ore body and processed tailings. Results are presented in **Table B3** (**Attachment B**).

3.1.9.2 Multi-element concentrations in supernatant and water extracts

There are no specific regulatory criteria for metal/metalloid concentrations in leachate from mine materials on mine sites in Queensland. As such, RGS has compared the multi-element results in water extracts from three tailings solids and three tailings supernatant samples with Australian guideline values for freshwater aquatic ecosystems (95 % species protection level) and livestock drinking water (ANZG, 2018). These guidelines are provided for context only and are not intended to be interpreted as "maximum permissible levels" for site water storage or discharge.

It should be noted that during the sample collection and laboratory preparation, the physical agitation and mixing of the samples can affect the physical stability of minerals and increase their solubility in a "first flush" leaching event, such as a static water extract test, which may not reflect the field situation where materials of varying particles sizes will be placed and rainfall/hydrological interaction with these materials is highly variable.

The results from multi-element testing of water extracts (1:5 solid: water) from the mine material and tailings solid and supernatant samples are presented in **Table B4** (**Attachment B**).

The pH of the water extracts from the samples ranges from 6.81 to 9.21 and is typically alkaline (median 8.24). Most samples, at least initially, add some alkalinity to contact water as the pH of the deionised water used in the test program was pH 5.4. The pH values are circum-neutral to alkaline across all samples from the mine materials and tailings.

The net alkalinity in the water extracts is expressed as the equivalent concentration of $CaCO_3$ in solution. The values for the sample water ranges from the equivalent of 11 to 149 mg/L $CaCO_3$ and has a median value of 33 mg/L $CaCO_3$. The net alkalinity values for the samples are all positive, indicating that the initial contact water with mine materials and tailings have excess acid buffering capacity in the unlikely event of that any acidity is generated by a sample material.

The EC value of the water extract from the samples ranges from 63 to 1,740 µS/cm and has a very low median of 187 µS/cm. The tailings supernatant samples have an EC that is marginally greater than the applied Australian guideline value for freshwater aquatic ecosystems (95 % species protection) of <1,000 µS/cm, whereas the water extracts from tailings solids have values within the applied guideline for EC.

The concentration of the major ions in the water extracts are relatively low compared to the Australian guideline values. The exception is fluoride, for which 5 mine material composites and 2 supernatant samples exceed the livestock drinking water guideline of 2.0 mg/L. The concentration of sulfate (SO_4^{2-}) in the water extracts ranges from 4 mg/L to 526 mg/L (median 31 mg/L) and is well below the livestock drinking water guideline of 1,000 mg/L (ANZG, 2018).

The concentration of most dissolved metal/ metalloids in water extracts are below the laboratory LoR. The majority of dissolved metal/ metalloid concentrations are below the applied water quality guideline criteria. The exceptions are aluminium (15 samples), arsenic (5 samples), boron (2 samples), chromium (2 samples), copper (1 sample), nickel (1 sample), selenium (1 sample) and zinc (9 samples), which can have concentrations greater than the applied freshwater system water quality guideline values for 95 % species protection. With the exclusion of molybdenum (Mo) in one overburden sample, all of the dissolved metal/metalloid concentrations are below the applied livestock drinking water guideline values.

The results indicate that initial contact water with the tailings has a low to negligible risk of producing metalliferous drainage. Longer term leaching dynamics in KLC are investigated in **Section 3.4**.

3.1.10 Static hydrocarbons assessment

This section includes the results and a discussion of the hydrocarbon components of the mine materials (n=11), tailings composites (n=8), and supernatant (n=3), which were performed alongside the multi-element testing. All geochemical testing was performed by ALS and laboratory certificates are available in **Attachment E**.

Total petroleum hydrocarbons (TPH) and Total recoverable hydrocarbons (TRH) are a broad family of organic compounds that originally come from crude oil. They represent a mixture of compounds rather than an individual compound. Short chain compounds (C1-C9) are generally volatile and can be difficult to measure analytically. Longer chain hydrocarbons (C10-C40) can be thick, dark liquids or semi-solids. TPH can be used to measure concentrations of oil from natural or human-based contamination or organic reagents (e.g., MIBC), although cannot distinguish between each source. Dividing TPH into groups of similar carbon chain length can help to determine where the organic compounds originate and their potential toxicology effects.

Soluble (unfiltered) TPH concentrations in a static leach of the mine materials are listed in **Table 3-4**. These concentrations provide natural background levels of soluble organic materials, prior to processing. The results demonstrate that low concentrations of C10-C14 hydrocarbons are naturally occurring and are highest in soil (C01) and low grade ore (C06). Concentrations of C15-28 and C29-36 are below the LoR in natural mine materials.

Note: Due to limitations in the sample collection and leaching procedure, RGS and ALS agreed to exclude extremely volatile organics (≤C9) in the hydrocarbon analysis. It is assumed that short-chain compounds are (or were) present and that their exposure time in the disposal process would be very limited. Short-chain hydrocarbons have greater toxicity to aquatic organisms but are less persistent and degrade rapidly. These are best monitored in ground and surface water programs that have increased sampling frequency. For the geochemical aspects of the EIS, it is relevant to investigate the solubility of longer chain hydrocarbons that may having lasting impacts and could affect the long term management of processed waste.

For the Batch 1 tailing composites, soluble TPH concentrations are listed in **Table 3-5**.

Table 3-4: Static TPH concentrations in mine materials

Composite	Material type	Lithology	C10 - C14	C15 – C28	C29 – C36
Static leach (1:5 w:v)			Concentrations in µg/L		
C01	Soil	Alluvium	90	<100	<50
C02	Overburden	Claystone	70	<100	<50
C03	Overburden	Sandstone	60	<100	<50
C04	Overburden	Siltstone	<50	<100	<50
C05	Waste rock	Dolerite and metasediments	70	<100	<50
C06	Low grade ore	Granite breccia	100	<100	<50
C07	Low grade ore	Granite breccia	70	<100	<50
C08	Ore body	Granite and metasediments	60	<100	<50
C09	Ore body	Granite and metasediments	60	<100	<50
C10	Ore body	Granite and metasediments	50	<100	<50
C11	Ore body	Granite and metasediments	60	<100	<50

Table 3-5: Static TPH in water extracts of Batch 1 tailings composites

Composite	Description	C10 - C14	C15 – C28	C29 – C36
Static leach (1:5 w:v)		Concentrations in µg/L		
C101	Tailings Float #14	80	140	<50
C102	Tailings Float #15	100	230	<50
C103	Tailings Float #16	100	150	<50
C104	Tailings Float #17	70	140	<50
C105	Tailings Float #18	150	240	<50

The TPH concentrations in the Batch 1 tailing composites show that there is a slight increase in the C10-C14 fraction above background levels, as well as an increase in the C15-C28 fraction. This is consistent with the use of turpentine and diesel process reagents (**Section 2.1.3**). Very long chain hydrocarbons (C29-C36) are below LoR in the tailings. Short chain aliphatic alcohols (C6-C10) will likely volatilize, leaving behind a mixture of esters, ethers, alkanes, aromatics, and C12-C15 alcohol that may have some solubility. Any environmental influence of the longer chain TPH is beyond the scope of this report, however, it is recommended that an assessment of C15-C28 hydrocarbons are included in the baseline groundwater monitoring program.

An assessment of total petroleum/ recoverable hydrocarbons (TPH/ TRH) was conducted on both supernatant and water extracts of the Batch 2 tailings solids. The results for TPH are separated into carbon chain length (i.e., C10-C14, C15-C28, and C29-C36) and exclude the highly volatile fraction (<C10). The process reagents used to produce the Batch 2 tailings are MIBC and diesel (**Section 2.1.5**). For supernatant, medium carbon chain compounds (C15-C28) range from 7,370 to 8,960 µg/L and constitute the majority of the organic carbon load. Short chain hydrocarbons (C10-C14) range from 3,950 to 4,620 µg/L, while long chain compounds (C29-C36) are close to the LoR (≤100 µg/L) (**Table 3-6**).

Trends are typically similar for water extracts from the tailings solids, although the concentrations are reduced by one to two orders of magnitude. This result confirms that the concentration of soluble hydrocarbons in water will increase relative to the contact time with the tailings materials, due to the limited solubility of MIBC in water. The kinetic test program results in **Section 3.4** investigate whether these solutes are likely to persist in the longer term.

Table 3-6: Static TPH in water extracts of Batch 2 tailings composites

Sample	Description	C10 - C14	C15 – C28	C29 – C36
		Concentrations in µg/L		
T1	Tank 1 – Supernatant water (Batch 2)	3,950	8,560	90
T2	Tank 2 – Supernatant water (Batch 2)	4,620	8,960	90
T3	Tank 3 – Supernatant water (Batch 2)	4,230	7,370	100
Static leach (1:5 w:v)		Concentrations in µg/L		
001	Tank 1 - Tailings solid (Batch 2)	80	280	<50
002	Tank 1 - Tailings solid (Batch 2)	60	280	<50
003	Tank 1 - Tailings solid (Batch 2)	<50	220	<50

3.2 NORM testing

3.2.1 NORM in solid mine materials

Naturally occurring radioactive materials (NORM) testing on the mine materials was requested by environmental regulators. Granite rocks in Australia naturally contain higher concentrations of radioactive elements such as potassium (K), uranium (U), and thorium (Th) as they cool from magma and bind to rare minerals such as monazite and zircon. The radioactive decay series for U-238 is shown in **Figure 3-11**. Over time, U-238 and Th-230 undergo radioactive decay (producing alpha radiation) to produce Ra-226,, which emits beta and gamma radiation, as well as radon, a colourless, odourless, radioactive gas. The half-lives of these elements are shown in **Table 3-7**. In general, elements with shorter half-lives, such as Ra-226 are more toxic to humans as they can overwhelm the body's cellular and DNA repair mechanisms. Conversely, an element such as U-238 with a long half-life stays radioactive for an extended period of time.

The Esmeralda Supersuite is believed to have been derived from the partial melting of metasedimentary rocks and is not known in the literature to have anomalous radioactivity. Further to the east, granites in the Georgetown-Cairns-Charters Towers region shows mild enrichment in U content compared to other types of granites (**Figure 3-12**). Geochemical data from Schofield (2009), suggests these concentrations can be above 20 mg/kg in some locations. By comparison, solid multi-element U concentrations for the Esmeralda Project are much lower - approximately 5 to 6 mg/kg in the orebody, and 4 to 5 mg/kg in tailings (**Table B2, Attachment B**).

Consultation of the Radiometric Map of Australia (2nd Edition), produced by Geoscience Australia in 2010 also supports low concentrations of these radioactive elements (**Figure 3-12**).

Table 3-7: Naturally occurring radionuclides and their half-lives

Radionuclide	Symbol	Half-life		Radionuclide	Symbol	Half-life
Actinium 227	Ac-227	21,772 years		Thorium 227	Th-227	18.7 days
Lead 210	Pb-210	22.3 years		Thorium 228	Th-228	1.91 years
Potassium 40	K-40	1.25 billion years		Thorium 230	Th-230	75,400 years
Protactinium 231	Pa-231	32,760 years		Thorium 234	Th-234	24.1 days
Radium 223	Ra-223	11.4 days		Uranium 235	U-235	700 million years
Radium 226	Ra-226	1,600 years		Uranium 238	U-238	5.57 billion years
Radium 228	Ra-228	5.75 years				

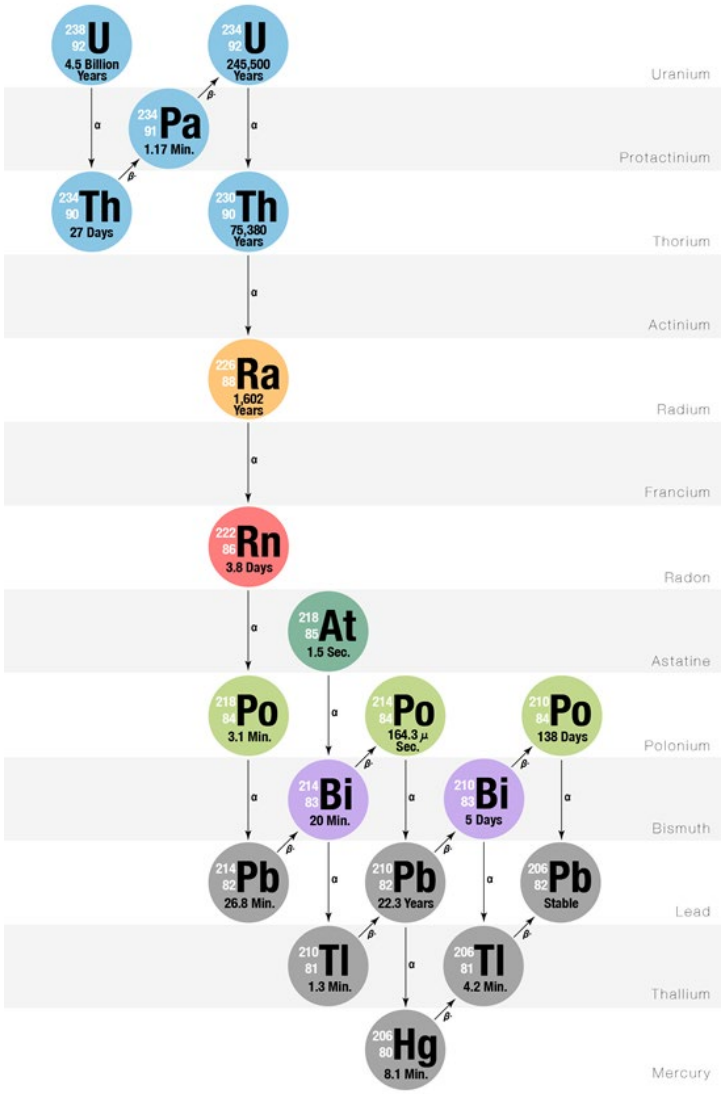


Figure 3-11: Uranium-238 decay series

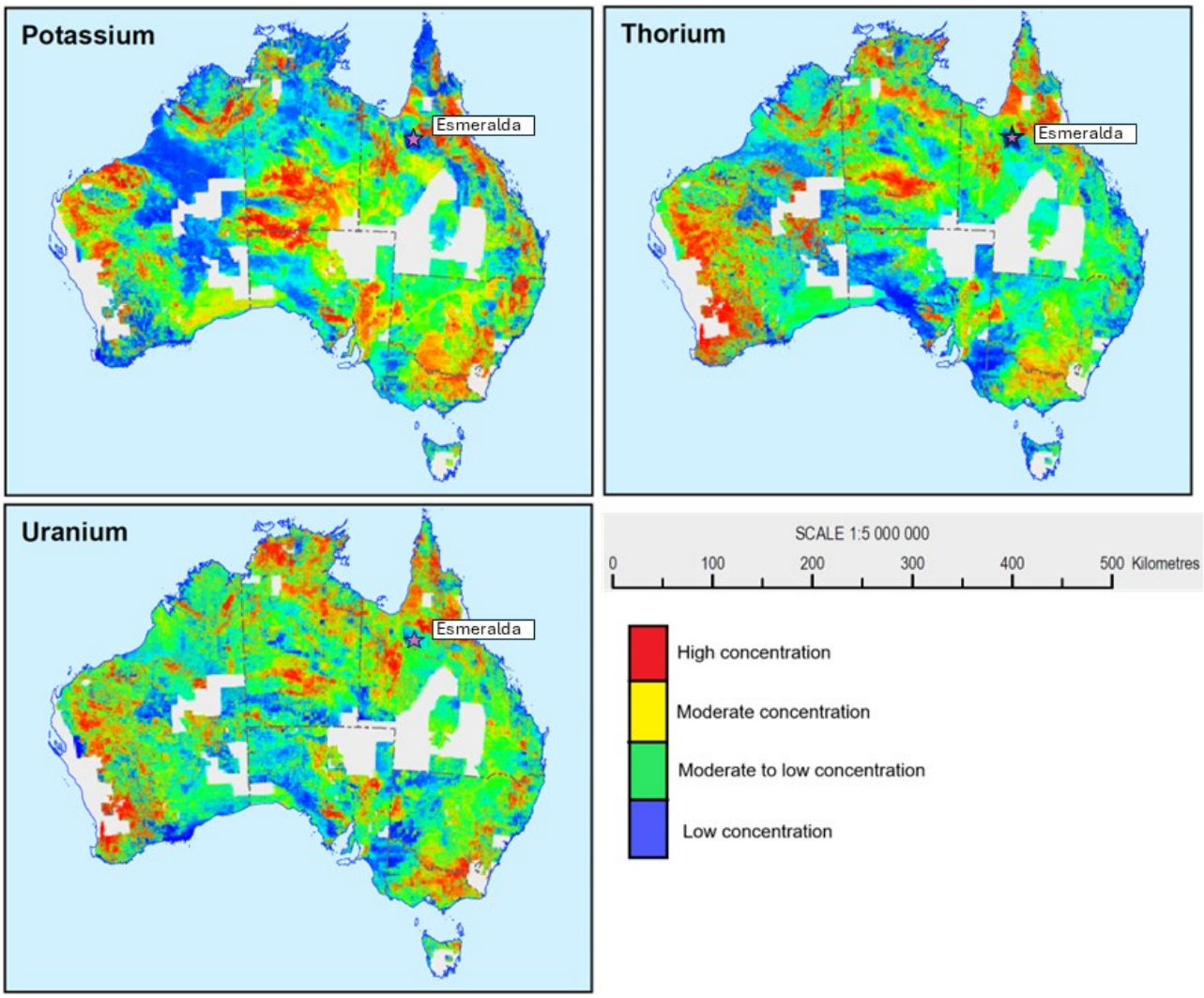


Figure 3-12: Radiometric maps of U, Th, and K

NORM testing results are presented in **Table B5** (**Attachment B**) and verify that radioactivity increases slightly in the low carbon waste rocks and ore body granite. **Table 3-8** presents the risk quotients that were calculated by performing a Tier 1 assessment using the ERICA software tool (ERICA, 2020). The sum of the risk quotients is highest in waste rock > ore body > low grade ore > tailings > overburden > soil. Soil has a risk quotient of 6, compared to waste rock, which is 42. All of the risk quotients are less than 50. For a single radionuclide, a risk quotient greater than 1 indicates a screening dose rate above 10 μGy/h and is expected to have an environmental impact (e.g., on freshwater species such as insect larvae, as well as vascular plants). The highest risk radionuclides are therefore Ra-226, followed by Ra-228, and Th-228. Other radionuclides produce very low to negligible screening dose rates of radiation.

K-40 is one of the radioactive elements that occurs naturally in granite rocks. Results for K-40 range from 54 Bq/kg DW in the soil to 1,350 Bq/kg DW in the waste rock, and follow a similar pattern to other radionuclides. Despite the relatively high dosage, K-40 does not pose a radiation threat to the environment, as it is processed in the body of humans and animals exactly like stable K-39. So, even though it is radioactive, it does not bioaccumulate. Therefore, it is not included in the ERICA software program.

Table 3-8: Risk quotients for radionuclides

Element	Soil	Overburden	Low Grade Ore	Waste rock	Ore body	Tailings
Pa-231	0.0227	0.0333	0.0484	0.0605	0.0847	0.0393
Pb-210	0.035	0.035	0.084	0.118	0.101	0.078
Ra-226	3.64	6.5	22.29	32.25	24.95	18.99
Ra-228	1.034	2.012	5.327	4.779	4.651	3.896
Th-227	0.0231	0.0424	0.0578	0.0938	0.113	0.0373
Th-228	0.756	1.411	3.598	3.136	3.171	2.682
Th-230	0.199	0.274	0.428	0.771	0.399	0.371
Th-234	0.00083	0.0013	0.0034	0.0061	0.0046	0.0033
U-235	0.0071	0.0122	0.0251	0.0457	0.0328	0.0264
U-238	0.104	0.166	0.487	0.776	0.585	0.413
Sum	**6**	**10**	**32**	**42**	**34**	**27**

Note: Shaded cells have a risk quotient >1 and screening dose rate above 10 mGy/h.

Screening reference levels for radionuclides in soil are tabulated in QLD Health (2020), sourced from NCRP (1999). Values are considered conservative and designed to restrict the total annual dose to any exposed person from a contaminated site to no more than 250 μSv. Referring to measured data in **Table B5** (**Attachment B**), relevant radionuclides from the U-238 decay series are listed in **Table 3-9** below. Data confirms that higher toxicity radionuclides such as Ra-226 and Pb-210 are typically confined within the low carbon waste rock and ore body. However, Ra-226 is present above the screening reference level throughout the stratigraphic profile (i.e., including background soil). This infers that local freshwater and terrestrial species have likely already adapted to low levels of radioactivity from Ra-226.

In general, the results indicate that the concentration of NORM in the mine materials is slightly above the background level contained in uncontaminated soil but are unlikely to pose a significant threat to human health or to the environment.

Table 3-9: Screening reference levels for radionuclides in soil

Radionuclide	Screening reference level activity concentration (Bq/kg)	Exceeded in
Pb-210	14	Waste rock, ore, and tailings
Ra-226	3.7	All materials
U-238	620	None

3.2.2 NORM in TCLP soluble extracts

QLD Health (2020) states:

"A sufficient number and range of soil samples should be tested to determine the potential for leachability of radionuclides. The appropriate test is a Toxicity Characteristic Leaching Procedure (TCLP), as mentioned in the Radiation Safety Regulation 2010, to test for gross alpha and beta in the leachate."

The TCLP leach is a procedure designed by the Environmental Protection Agency (EPA) to simulate how solid waste will behave if disposed of in a landfill. A TCLP leach involves several steps:

1. **Extraction** – the solid waste is crushed and tumbled for 18 hours with an acidic extraction fluid (for a neutral/acidic sample, reduction to pH 4.88-4.98 is used).
2. **Filtration** – the mixture is filtered, separating the remaining solids from the liquid.

3. **Analysis** – in this case, gross alpha and gross beta are measured using a technique called Gas Proportional Counting. The liquid sample is evaporated to dryness, and the remaining solid emits radiation that is ionised to gas and detected.

RGS has followed this approach and used a TCLP leach but notes that this is likely to be slightly stronger than a water-soluble extract (**Section 3.1.9**). Results in this section should be regarded as conservative as conditions in a landfill are unlikely to be the same as those in a waste rock dump or backfilled void. Landfill waste contains organic materials that break down slowly under acidic, anoxic conditions, producing gas (e.g. methane and carbon dioxide) and slightly elevated temperatures (between 25 to 45ºC). By comparison, mine waste typically contains negligible organic matter, and conditions can be either oxic or anoxic.

The screening reference level for radionuclides in water is based upon the Australian Drinking Water Guidelines (ANZG, 2018) and referred to in QLD Health (2020). Results are presented in **Table 3-10**. The screening reference level for gross alpha is 0.5 Bq/L and for gross beta 0.5 Bq/L.

- Gross alpha levels are slightly above the screening level in low grade ore and waste rock. Radionuclides that primarily emit alpha radiation include Ra-226, U238, Th-230, and Th-228.
- Gross beta levels are slightly above the screening level in low grade ore, ore body, and tailings. Radionuclides that primarily emit beta radiation include Ra-228, and Pb-210.
- Gross alpha and beta radiation in the ore, waste rock, and tailings is approximately twice that detected in the overburden, and above background soil (which is below LoR).

If the screening level is exceeded, it is not an automatic health violation. Rather, it triggers further testing to identify specific radionuclides to calculate the annual radiation dose. This task has been completed in **Section 3.2.1** and interpreted results in **Table 3-8**.

Overall, the TCLP soluble results indicate there is a slight increase in NORM within the waste rock, ore, and tailings materials compared to background soil conditions, aligning with those for the solid materials.

Table 3-10: Soluble NORM results (TCLP leach)

Analysis →	Gross Alpha	Gross Beta
Limit of Reporting	0.04 Bq/L	0.1 Bq/L
Screening Level (ANZG, 2018)	0.5 Bq/L	0.5 Bq/L
Material type	Results in Bq/L	
Soil	<0.08	<0.26
Overburden	0.23	0.32
Low grade ore	0.56	0.71
Waste rock	0.74	0.47
Ore body	0.34	0.66
Tailings	0.48	0.72

3.2.3 Acid buffering characteristic curves

The acid buffering characteristic curve (ABCC) test is the measurement of effective ANC to determine how much of a substance can effectively neutralise acid at different pH levels. ABCC tests were conducted on one Batch 2 tailings solid sample (2024066_001) with results illustrated in **Figure 3-13**. RGS tested pulped size fraction (<0.075 mm) of material to indicate the maximum acid neutralisation available. Under field conditions, particle size is variable (clay to cobbles) and larger rock fragments would be expected to release their neutralisation capacity more slowly.

The ABCC result show a rapid decrease in pH from 8 to 4.5 with the addition of acid, suggesting a very low effective buffering capacity (2.9 kg H_2SO_4/t) that is less than the measured ANC (13.1 kg H_2SO_4/t). However, the results are aligned with those expected for granite rocks, which have very low buffering capacity compared to carbonate-rich rocks (e.g., limestone). The predominant minerals in granite are quartz, felspar, and micas (**Section 1.5.2**).

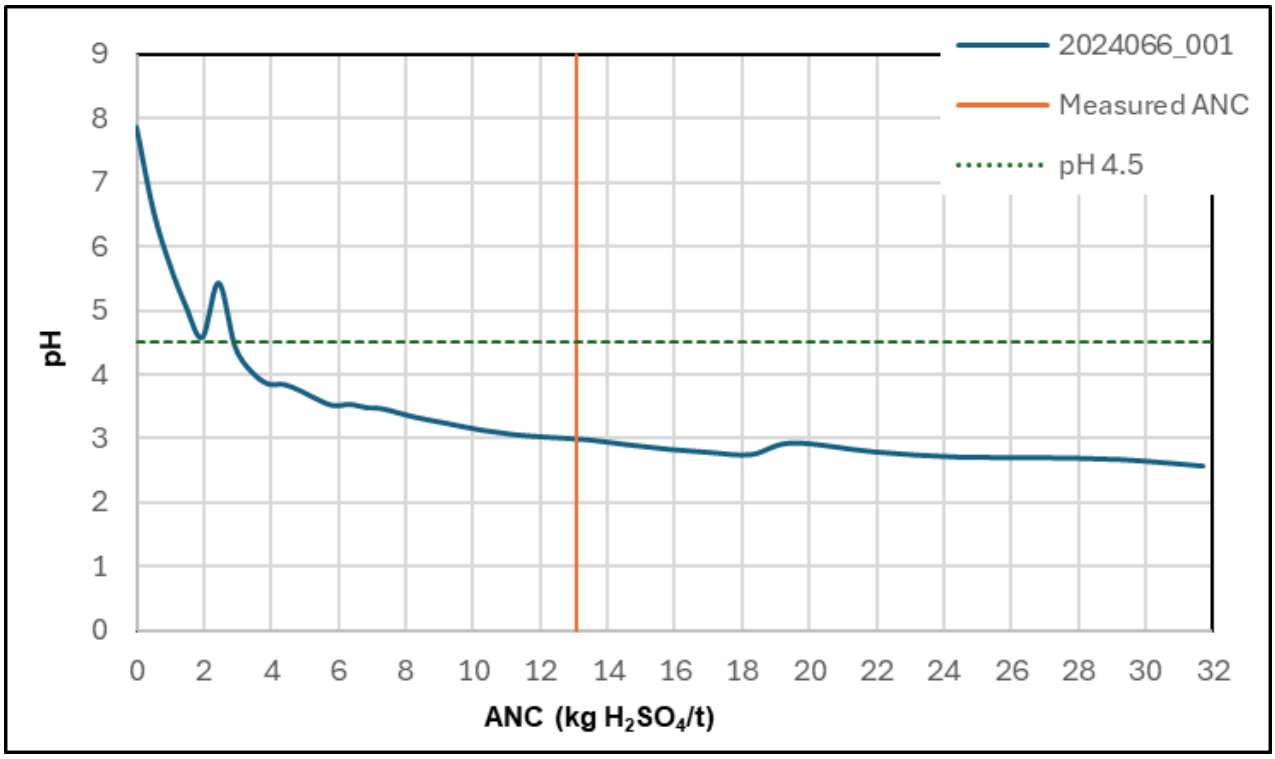


Figure 3-13: Tailings acid buffering characteristic curve

3.3 Mineralogy

The mineralogy laboratory certificates for X-Ray Vision for the mine material and tailing composites are in **Attachment H**. The mine material samples underwent milling (micronisation) as an additional sample preparation to help resolve the X-Ray Diffraction (XRD) spectra. Batch 1 tailings were analysed as pulp samples (0.075 mm).

The mineralogical results of the eleven mine material and five Batch 1 tailing composite samples tested by X-Ray Vision is provided in **Table 3-7**. The major minerals in the samples are quartz (20 to 77 %), muscovite (Trace to 19 %), kaolinite (0 to 19 %), chlorite (0 to 24 %), plagioclase feldspar (0 to 14 %), potassium feldspar (0 to 11 %) and amorphous material (2 to 44 %). Mixed layer clays (illtite/smectite) were detected only in weathered overburden samples (7 to 27 %). Graphite (14 to 26 %) is present in ore body samples and low grade ore samples that also have elevated sulfur content.

Minor minerals include pyrite (≤1 %), clinozoisite (0 to 5 %), magnesian calcite (0 to 2%), and trace quantities of hematite and boehmite (trace to 1 %). The amorphous fraction is variable and implies that a significant proportion of the minerals cannot be identified by conventional XRD.

It is likely that the majority of sulfide minerals are reporting to the amorphous fraction. Nagrom XRD results (**Table 1-2** and **Attachment I**), X-Ray Vision (**Table 3-11** and **Attachment H**) and Blue Minerals Consultancy (**Table 3-12** and **Attachment J**) show general agreement on major minerals, although there is a lack of consensus on the sulfide sulfur speciation. This finding is investigated further in **Section 3.3.1**.

3.3.1 XRD Expert Opinion Report

An expert opinion was sought to interpret the XRD spectra and resolve some of the inconsistency between the various mineralogy reports. Andrea Gerson of Blue Minerals Consultancy is an honorary professor at the Australian National University, with over 25 years' experience in the fields of mineralogical research and geochemistry. Raw spectral data for the XRD analyses was provided to Professor Gerson from X-Ray Vision. The expert opinion report (BMC, 2025) is included in **Attachment J**.

RGS has summarised some of the key points extracted from BMC (2025) below.

- The amorphous phase is much higher in the tailings indicating a greater proportion of nanocrystalline material. A micronisation sample preparation step is recommended for any future XRD or alternative mineralogical test work to decrease preferential orientation.
- Apart from a small quantity of calcite detected in two of the samples, ANC in the form of carbonate minerals is low in these materials.
- Rapid neutralisation may be provided by ion exchange from mica, with slower neutralisation leaching from chlorite and potentially Ca from felspar and clinozoisite.
  - RGS notes that this slow leaching ANC and potentially slow release acid indicates a need for kinetic testing to determine how the respective reaction kinetics.
- Overall, it is unlikely that 'hidden ANC' is responsible for the NAF behaviour of the PAF samples.
- BMC found that only pyrrhotite was present in the mine material samples, and pyrite was not detected.
- Pyrrhotite was not detected in the tailings samples but is likely to have been present in the amorphous phase. No other sulfide minerals were found, although sulfur is expected be present in some form as the measured sulfide content using the Scr technique is approximately 1.5 %.
- Sulfur may be present in a reduced state (i.e., oxidation state less than 6+) that is accessible to Scr (and NAG testing) but not in a recognised sulfide phase that is acid forming.
- In natural environments, pyrrhotite will mostly oxidise to elemental sulfur, which is a NAF reaction. It is therefore possible that at least some of the pyrrhotite (as sulfide sulfur) has weathered to elemental sulfur that is present within the graphite.
- The weathering of elemental sulfur (S) to sulfate (SO_4^{2-}) is acid forming but is extremely slow and does not constitute a significant acid drainage risk.

Chemical equations for the conversion of pyrrhotite to elemental sulfur are presented in **Section 1.5.2**.

It is most likely that the initial circumneutral pH produced by the PAF ore body and tailing samples is due to the presence of both pyrrhotite and elemental sulfur. The oxidation and weathering of these minerals is very slow in comparison to pyrite, which is commonly responsible for most AMD issues. When the expert opinion report was written, there was insufficient data to demonstrate the reduced risk of these materials with respect to potential for AMD. However, kinetic testing has provided key evidence to demonstrate that the AMD risk profile can be lowered slightly due to the extended lag period and slower than usual rate of acid generation.

3.3.2 Weathering of elemental sulfur

As discussed above and in **Section 1.5.2**, the formation of elemental sulfur slows the dissolution rate of pyrrhotite in oxidising conditions. Thomas et. al., (1998) studied this phenomena in detail and observed that elemental sulfur forms a protective, passivating layer on the mineral surface of pyrrhotite. This restricts the diffusion of iron II (Fe^{2+}) and the formation of sulfuric acid. However, this inhibition mechanism changes with temperature, and rapid dissolution can trigger above 40 ºC.

Sulfide minerals are susceptible to exothermic self-heating, meaning that under certain conditions materials can heat up without an external heat source. Kim et.al., (2024) describes three stages of self-heating:

- Stage A: Room temperature to 100 ºC
- Stage B: 100 to 350 ºC
- Stage C: Above 350 ºC

Sulfide self-heating reactions are heavily influenced by the interaction between elemental sulfur and pyrrhotite during Stage A conditions. Furthermore, Kim et.al., (2023) found that elemental sulfur is incapable of fuelling Stage B self-heating on its own, as it needs to interact with sulfide minerals (e.g., pyrrhotite) in the presence of moisture and air in order to self-heat. For this reason, elemental sulfur is considered significantly less reactive than pyrrhotite, and this difference has been quantified to a factor approximately 10^3 (Thomas et. al., 1998). Although self-heating and acid production (weathering) of elemental sulfur are different phenomena, both are controlled by surface area (i.e., the reactive surface available for oxidation) and temperature.

The weathering of elemental sulfur to form jarosite requires the oxidation of S^0 (s) to SO_4^{2-} (aq), which is a process dependent on activation by sulfur-oxidising soil bacteria (e.g., *Acidithiobacillus thiooxidans)*. It primarily occurs under acidic, water-limited conditions and can be used as a agricultural additive as a long-term amendment to lower pH. Elemental sulfur can also be used as an additive to alkaline tailings to accelerate the growth of acidophilic bacteria (e.g., *Alicyclobacillaceae*, *Bacillaceae*) to enhance weathering and soil aggregate formation (Yi et.al., 2023). Once jarosite formation has occurred, stored acidity will then be released slowly under atmospheric conditions at neutral pH.

Jarosite formation can occur at very low temperatures (e.g., in Antarctica, Mars) (Science, 2021, Dehouck et.al.,, 2012). However, higher temperatures increase the kinetics (reaction rate) of jarosite precipitation and increase the crystallinity and size/stability of the jarosite crystals. Optimal conditions occur between 80 to 100 ºC at a pH <2.5. While many sulfur oxidising bacteria prefer acidic environments (pH 1 to 5), they can still oxidise elemental sulfur at neutral to slightly alkaline pH (pH 7 to 9), although they cannot grow in this environment. Therefore, in acidic, moist, high temperature conditions, the oxidation of elemental sulfur will be relatively high and is expected to have a low to moderate contribution to the release of acid. Conversely, under low temperature, neutral pH, or reducing conditions, elemental sulfur will have very low to negligible reactivity and is not expected to significantly increase acid generation.

In summary, the contribution of elemental sulfur to the rate of acid generation is dependent on several factors. The conversion of elemental sulfur to jarosite will be increased under oxidising, free draining conditions (e.g., 10 times slower than pyrrhotite), and slower in reducing, saturated conditions (e.g., 1000 times slower than pyrrhotite). The rate of acid generation from elemental sulfur in tailings, when kept inundated in a backfilled void, is likely to be in the order of hundreds to thousands of years, and have very minor impact during the project life and post closure.

Table 3-11: XRD results for mine material and Batch 1 tailings composite samples (X-Ray Vision)

	Mine materials											Tailings				
	Soil	Overburden - Claystone	Overburden - Sandstone	Overburden - Siltstone	Waste rock	Low grade ore – NAF-B	Low grade ore - PAF	Ore body - NAF	Ore body – PAF-LC	Ore body - PAF	Ore body – PAF-HC	Float #14	Float #15	Float #16	Float #17	Float #18
	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C101	C102	C103	C104	C105
Phase Name/Formula	All values Weight %															
Quartz; SiO_2	77	56	66	25	31	30	33	20	26	28	23	21	27	37	29	33
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	Trace	3	5	4	19	7	7	16	3	3	2	2	1	9	7	5
Kaolinite; $Al_2Si_2O_5(OH)_4$	Trace	8	8	19	13	ND	---	---	---	---	---	4	3	5	4	4
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	ND	ND	1	6	3	7	9	24	19	11	13	9	7	10	11	10
Mixed layer illite/smectite	ND	27	10	7	---	---	---	---	---	---	---	---	---	---	---	---
Plagioclase Feldspar; $NaAlSi_3O_8$	ND	Poss. Trace	3	1	2	8	9	10	10	11	14	9	10	9	12	11
Potassium Feldspar; KAl_3SiO_8	Trace	1	5	7	7	5	6	4	6	8	7	11	9	5	4	3
Pyrite; FeS_2	ND	ND	ND	ND	---	---	---	---	1	Trace	ND	Trace	Trace	1	Trace	Trace
Hematite, aluminar; $(FeO_{0.86}AlO_{0.14})_2O_3$	---	---	---	---	---	---	---	---	---	---	---	Trace	Trace	1	1	Trace
Anatase (TiO_2)	ND	Trace	Poss. Trace	Trace	Trace	Poss. Trace	Poss. Trace	Possible	---	---	---	---	---	---	---	---
Boehmite; AlO.OH	---	---	---	---	---	---	---	---	---	---	---	---	---	Poss. Trace	ND	---
Clinozoisite; $Ca_2Al_3(SiO_4)(Si_2O_7)O(OH)$	---	---	---	---	1	5	1	Poss. Trace	---	---	Poss. Trace	---	---	---	---	---
Calcite; magnesian; $(Ca, Mg)CO_3$)	---	---	---	---	---	---	ND	2	---	---	---	---	---	---	---	---
Graphite, C	---	---	---	---	---	---	17	14	25	26	20	---	---	---	---	---
Amorphous Material	23	5	2	31	24	38	18	10	10	13	21	44	43	23	32	34

Table 3-12: XRD results for mine material and Batch 1 tailings composite samples (BMC)

	Mine materials											Tailings				
	Soil	Overburden - Claystone	Overburden - Sandstone	Overburden - Siltstone	Waste rock	Low grade ore – NAF-B	Low grade ore - PAF	Ore body - NAF	Ore body – PAF-LC	Ore body - PAF	Ore body – PAF-HC	Float #14	Float #15	Float #16	Float #17	Float #18
	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C101	C102	C103	C104	C105
Phase Name/Formula	All values Weight %															
Quartz; SiO_2	96	76	83	34	35	43	40	29	33	41	35	22	30	21	20	16
Muscovite; $KAl2(Si3Al)O10(OH,F)2$	1	7	9	12	29	11	8	15	7	6	6	4	5	3	5	2
Kaolinite; $Al_2Si_2O_5(OH)_4$	1	14	2	26	10	6	3	7	5	0	3	2	0	3	2	3
Chlorite; $(Mg, Fe)6(Si, Al)4O10(OH)8$	---	---	2	0	0	5	4	7	4	3	4	3	3	2	3	3
Mixed layer illite/smectite	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Plagioclase Feldspar; $NaAlSi3O8$	---	---	1	Trace	7	13	17	18	15	19	19	12	14	10	11	11
Potassium Feldspar; $KAl3SiO8$	---	3	4	13	4	11	21	13	16	20	19	13	16	13	14	13
Pyrrhotite; $Fe_{(1-x)}S$	---	---	---	---	---	---	---	---	---	4	5	---	---	---	---	---
Hematite, aluminar; $(FeO0.86AlO0.14)2O3$	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Anatase (TiO_2)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Boehmite; AlO.OH	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Clinozoisite; $Ca_2Al_3(SiO_4)(Si_2O_7)O(OH)$	---	---	---	---	---	8	3	---	---	---	---	---	---	---	---	---
Calcite; ($CaCO_3$)	---	---	---	---	1	---	---	2	Trace	---	---	---	---	---	---	---
Graphite, C	---	---	---	---	---	2	3	9	4	5	6	0.1	Trace	0.1	0	0.1
Amorphous Material	2	---	---	16	15	---	Trace	---	15	3	3	45	32	48	45	52

3.4 Tailings physical testing

3.4.1 Bulk density

Bulk density on the tailings solids was measured at ALS using an in-house method. Laboratory certificates for ALS are included in **Attachment E**.

Bulk density is the weight of the soil in a given volume. Natural soil usually has a bulk density ranging from 1.1 to 1.7 g/cm^3. Soil with a bulk density greater than 1.6 g/cm^3 will tend to restrict root growth. Bulk density increases with compaction and depth and is generally higher in sandy soils. In soil with good structure, bulk density can be lower as there is a lot of pore space between the particles. This is especially true for soil that is rich in organic matter.

Results in **Table 3-13** verify that the Batch 1 tailings have a bulk density range (1.50 to 1.66 g/cm^3) that is generally suitable for revegetation but would perform better with a soil cover when rehabilitated. The average bulk density is 1.57 g/cm^3. By comparison, the Batch 2 tailings have a bulk density range of 1.41 to 1.44 g/cm^3 and the average bulk density is 1.42 g/cm^3 (**Table 3-14**). The Batch 2 tailings are slightly less dense than those previously tested. These results are relevant to the rehabilitation of any above ground interim tailings storage facility, although advice on the thickness of soil cover is beyond the scope of this report.

There appears to be a minor correlation between mineralogy and bulk density. Tailing composites that are rich in quartz and muscovite, and relatively low in feldspar (e.g. Float #16) tend to have low bulk density. Conversely, tailing composites that are relatively low in quartz and muscovite and high in feldspar (e.g., Float #14) tend to have high bulk density.

Table 3-13: Bulk density results for Batch 1 tailings

Composite	Description	Bulk density (kg/m^3)	Bulk density (g/cm^3)
C101	Tailings Float #14	1660	1.66
C102	Tailings Float #15	1600	1.60
C103	Tailings Float #16	1500	1.50
C104	Tailings Float #17	1510	1.51
C105	Tailings Float #18	1580	1.58
Average bulk density			**1.57**

Table 3-14: Bulk density results for Batch 2 tailings

Sample ID	Description	Bulk density (kg/m^3)	Bulk density (g/cm^3)
2024066_001	Tailings Solid Tank 1	1440	1.44
2024066_002	Tailings Solid Tank 2	1420	1.42
2024066_003	Tailings Solid Tank 3	1410	1.41
Average bulk density			**1.42**

3.4.2 Particle Size Distribution

Bulk composites of Batch 1 tailings composites (n=5) and individual Batch 2 tailings (n=3) were subjected to particle size distribution (PSD) with hydrometer analysis at ALS. Results are presented in **Table 3-15** and **Table 3-16.**

The Batch 1 tailing composites are comprised of clay (5 to 10%), silt (21 to 28%), and sand (67 to 73%). Gravel sized particles (>2 mm) were absent. Tailings Float #16 (C103) had the highest proportion of clay particles (10%), while Tailings Float #17 (C104) had the most silt (28%). These two samples are relatively fine. Tailings Float 14 (C101) had the most sand (73%) and this sample was relatively coarse.

Based on the results from the particle size distribution analysis, as well as mineralogy and bulk density, RGS estimates that the tailings can be classified from coarsest to finest in the order:

Float #14 > Float #15 > Float #18 > Float #17 > Float #16

The Batch 2 tailings are comprised of clay (15 to 16%), silt (35 to 37%), sand (47 to 49%), and gravel (1%). Gravel sized particles were present in one sample. All of the tailings samples had very similar distributions of particles across all samples.

Particle size distribution graphs are shown in **Figure 3-14** and **Figure 3-15**. The Batch 1 tailings had a relatively high proportion of sand, while the Batch 2 tailings had a more even spread of clay, silt, and sand particle sizes, but sand was still the dominant fraction.

Tailings that are high in sand are expected to be quite permeable and to drain quickly. They tend to undergo less shrink and swell behaviour (typically accompanied by surface cracking) than tailings that are high in clay or silt. Therefore, when contained in a dam, the tailings are expected to be reasonably stable and are unlikely to form a hard surface crust.

Table 3-15: Particle size distribution results for Batch 1 tailings

Composite	Description	Clay (<0.002 mm)	Silt (0.002 – 0.06 mm)	Sand (0.06 – 2.0 mm)	Gravel (>2.0 mm)
C101	Tailings Float #14	5%	22%	73%	0%
C102	Tailings Float #15	5%	25%	70%	0%
C103	Tailings Float #16	10%	21%	69%	0%
C104	Tailings Float #17	5%	28%	67%	0%
C105	Tailings Float #18	6%	23%	71%	0%

Table 3-16: Particle size distribution results for Batch 2 tailings

Sample ID	Description	Clay (<0.002 mm)	Silt (0.002 – 0.06 mm)	Sand (0.06 – 2.0 mm)	Gravel (>2.0 mm)
2024066_001	Tailings Solid Tank 1	15%	37%	47%	1%
2024066_002	Tailings Soild Tank 2	16%	35%	49%	0%
2024066_003	Tailings Solid Tank 3	16%	37%	47%	0%

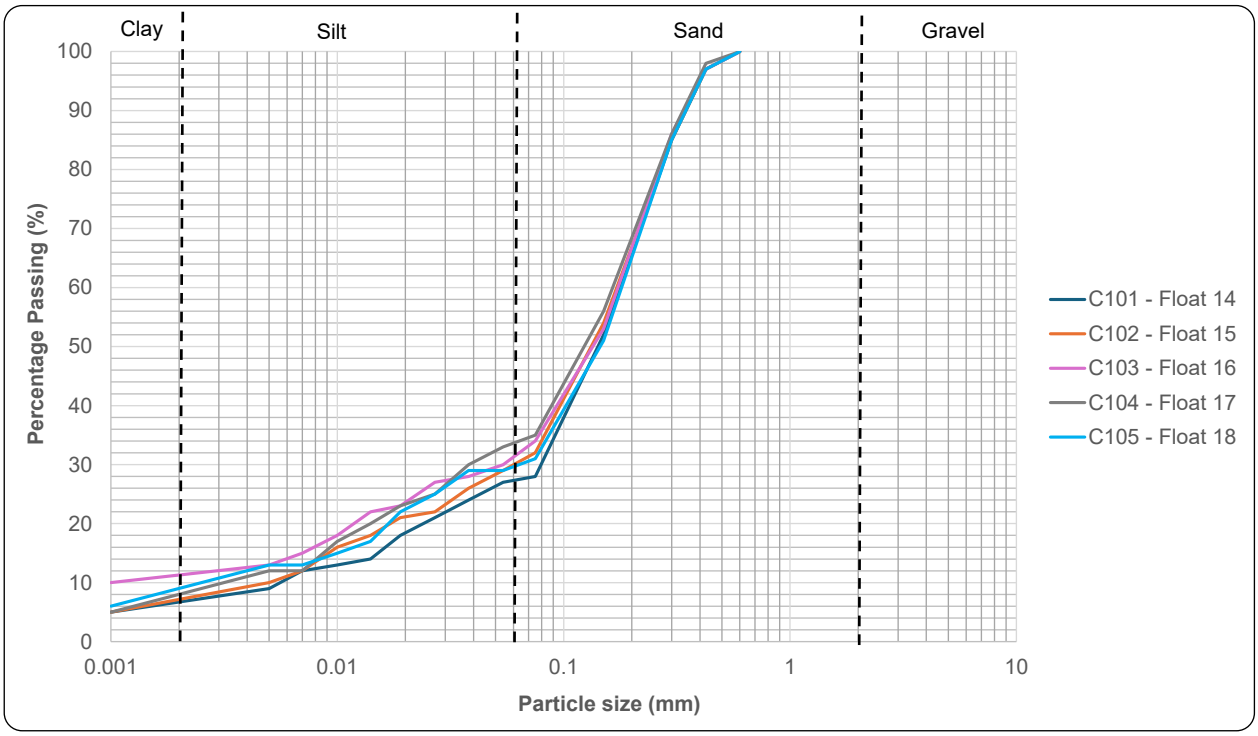


Figure 3-14: Particle size distribution curves for Batch 1 tailing composites

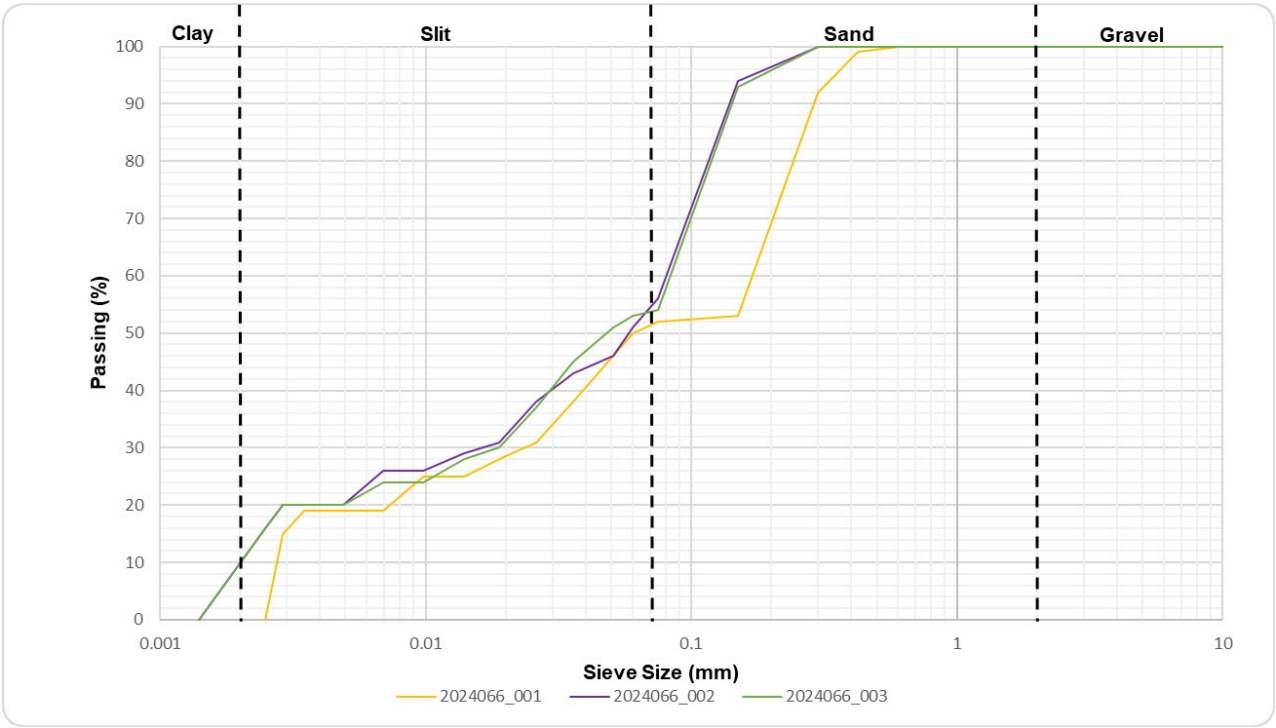


Figure 3-15: Particle size distribution curves for Batch 2 tailings

3.4.3 Emerson Class

Bulk Batch 1 tailing composite samples (n=5) and individual Batch 2 tailings samples (n=3) were subjected to Emerson Class testing at ALS. Results are presented in **Table 3-17** and **Table 3-18** and verify that soil texture ranges from clayey sand to sandy loam. ALS laboratory certificates are available in **Attachment E**.

Emerson Class 1 materials tend to be sodic, dispersive, and unstable, whereas Emerson Class 6 materials are non-sodic and heavily flocculated. A soil that is flocculated can form aggregate clumps that may not hold water in a dam. Conversely, unstable, dispersive materials erode quickly and can be difficult to revegetate. Materials of Emerson Class 3 or 4 are preferred for most construction works, and these soils tend to have a mixture of clay, silt, and sand particles, a high proportion of exchangeable Ca (rather than exchangeable Na), and are generally stable.

The tailings are Emerson Class 3 or 4 and are ideal in terms of structure and stability. They are also unlikely to be sodic or dispersive and less prone to erosion issues than other mining soil types.

Table 3-17: Emerson Class results for Batch 1 tailings

Composite	Description	Emerson Class	Texture	Dispersibility	Stability
C101	Tailings Float #14	3	Clayey Sand	Unlikely to be sodic	Likely to be moderately flocculated and stable
C102	Tailings Float #15	3	Clayey Sand		
C103	Tailings Float #16	3	Clayey Sand		
C104	Tailings Float #17	3	Clayey Sand		
C105	Tailings Float #18	3	Clayey Sand		

Table 3-18: Emerson Class results for Batch 2 tailings

Sample ID	Description	Emerson Class	Texture	Dispersibility	Stability
2024066_001	Tailings Solid Tank 1	4	Sandy Loam	Unlikely to be sodic	Likely to be moderately flocculated and stable
2024066_002	Tailings Solid Tank 2	4	Sandy Loam		
2024066_003	Tailings Solid Tank 3	4	Sandy Loam		

3.4.4 Soil Water Characteristic Curves

A complete set of soil water characteristic curve (SWCC) results from BioTrack are provided in **Attachment G**., The five Batch 1 tailing composites were combined into a single bulk sample that underwent SWCC testing. The three individual Batch 2 tailings samples were also combined into a single composite to undergo SWCC testing. The compositing of individual samples is required to obtain sufficient sample mass to meet physical testing requirements. Therefore, the SWCC results should be considered to represent the bulk material and will not detect small variations between individual samples. .

Water retention data was collected for the tailing composites (**Table 3-27** and**Table 3-20**), noting that gravimetric water content results have been adjusted for bulk density to calculate the volumetric water content. The average bulk density for Batch 1 tailings is 1.57 g/cm^3 (**Table 3-13**) and the average bulk density for Batch 2 tailings is 1.42 g/cm^3 (**Table 3-14**).

Soil water characteristic curves can be used to determine van Genuchten parameters, i.e., residual water content (θ_r) and the saturated water content (θ_s). The inflexion point of the curve indicates the field capacity of the soil, and upper and lower transition zones infer the wilting point and saturation, respectively.

For the Batch 1 tailings, the data bars and SWCC graph show that the behave as a sand and have a very low volumetric water content (2 m^3/m^3) at wilting point, indicating that water retention is typically low (**Figure 3-16**). At field capacity (the inflexion point of the curve) the volumetric water capacity can range from 15 to 30 m^3/m^3, indicating a high pore volume between the particles. The saturation point is only slightly higher than field

capacity (35 m^3/m^3), showing that the sample does not have a good capacity to retain excess moisture (e.g. by clay absorption). The Batch 1 tailings are expected to have a very low water retention and to drain quickly after a rain event.

Table 3-19: Water retention data for the Batch 1 tailings composite

% Gravimetric Water Content					
Suction	0 kPa	10 kPa	33 kPa	100 kPa	1,500 kPa
% Moisture	25.2	21.2	16.6	8.1	1.3
Volumetric Moisture Content (m^3/m^3) - based on bulk density 1.57 g/cm^3					
Suction	0 kPa	10 kPa	33 kPa	100 kPa	1,500 kPa
Volumetric water content (m^3/m^3)	39.564	33.284	26.062	12.717	2.041

Table 3-20: Water retention data for the Batch 2 tailings composite

% Gravimetric Water Content					
Suction	0 kPa	10 kPa	33 kPa	100 kPa	1,500 kPa
% Moisture	33.2	26.4	23.0	11.5	8.1
Volumetric Moisture Content (m^3/m^3) - based on bulk density 1.42 g/cm^3					
Suction	0 kPa	10 kPa	33 kPa	100 kPa	1,500 kPa
Volumetric water content (m^3/m^3)	47.144	37.488	32.660	16.330	11.502

The Batch 2 tailings also behave similarly to a sand, with a volumetric water content that increases quickly from wilting point to saturation (**Figure 3-17**). The residual water remaining at wilting point is 12 m^3/m^3, which is higher than the Batch 1 tailings and likely due to increased clay and silt content. At field capacity (the inflexion point of the curve) the volumetric water capacity is approximately 25 m^3/m^3. The saturation point is higher than field capacity (37 m^3/m^3), The SWCC data agrees with the PSD results (**Section 3.4.2**), verifying that the Batch 2 tailings are expected to drain quickly. Deposited in a TSF, the tailings will dry readily. A soil cover will be required as a higher moisture holding material is needed for revegetation and plant growth.

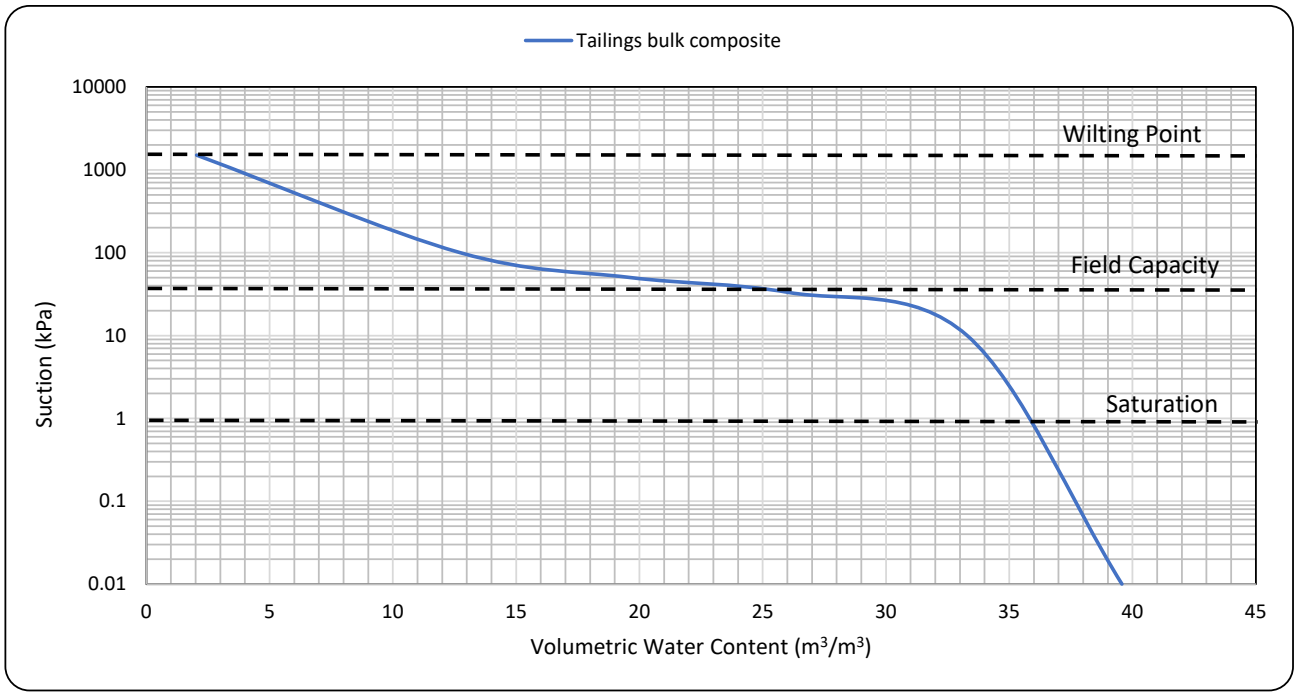


Figure 3-16: Soil water characteristic curve for the Batch 1 tailings composite

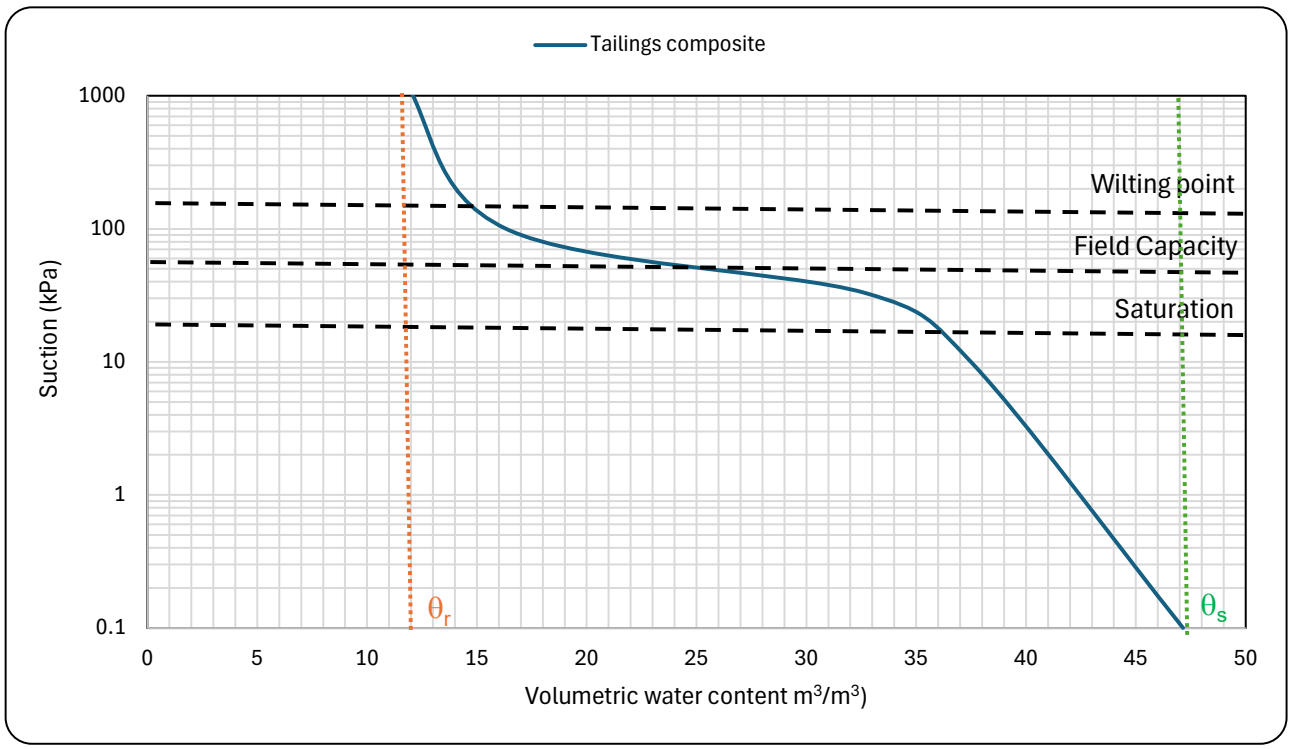


Figure 3-17: Soil water characteristic curve for Batch 2 tailings composite

3.4.5 Column settlement

The column settlement test measures how quickly particles flocculate and settle from a turbid mixture. The five Batch 1 tailing composite samples underwent column settlement testing. Photographs of the samples at hourly intervals are in **Figure 3-18** and **Figure 3-19**.

Results are summarised in **Table 3-21** and verify that the samples have good settlement and flocculate well but retain some turbidity after 144 hours. After the initial column agitation (0 hour), the solutions have extreme turbidity. Settlement occurs relatively quickly and is visible after approximately 4 hours, when the graphite float begins to separate at the surface of the solution. Float #15 and Float #16 (C102 and C103) appear to settle slightly quicker than the other composites. However, after 144 hours, Float #17 (C104) is partially clear, whilst the others still retain suspended solids throughout.

The dry volume of 100 g of tailings ranges from 70 to 125 mL (**Table 3-22**). The volume of the tailings after settlement was also measured, allowing a calculation of pore volume. Float #14 (C101) had a high dry and wet volume and from the PSD analysis, contained the most sand (**Table 3-15**). Conversely, Float #16 (C103) had a low volume with very little pore space and contained the most clay. This indicates that coarser tailings will require greater volume in a TSF but are likely to have higher permeability. It is understood that the clay proportion of the tailings is small and will have minimal impact on the TSF design.

The volume of material in the graphite float after column settlement may provide an estimate of the graphite left in the tailings after processing. In general, the finer tailings have less remaining graphite. The estimated graphite quantity from highest to lowest is:

Float #15 = Float #17 > Float #14 > Float #16 > Float #18

The column settlement results can be compared with groundwater studies (**Table 7-1, Attachment K**) that verify that natural turbidity in groundwater (530 to 770 mg/L) is greater than Australian freshwater aquatic ecosystem guidelines of 500 mg/L (ANZG 2018). Seepage from the tailings may contain some turbidity but is unlikely to adversely impact existing groundwater conditions.

Table 3-21: Summary of column settlement test results

	C101	C102	C103	C104	C105
Duration	Float #14	Float #15	Float #16	Float #17	Float #18
0 Hours	E	E	E	E	E
1 Hour	E	E	E	E	E
3 Hours	E	E	E	E	E
4 Hours	E	E	E	E	E
5 Hours	E	H	H	E	E
6 Hours	E	H	H	H	H
7 Hours	H	H	H	H	H
24 Hours	H	M	M	H	H
48 Hours	H	M	M	M	M
72 Hours	M	M	M	M	M
96 Hours	M	M	M	M	M
144 Hours	S	S	S	N	S
Hours to settle	**144+**	**144+**	**144+**	**144**	**144+**

Turbidity: E = Extreme, H = High, M = Moderate, S = Slight, N = Negligible

Table 3-22: Column settlement pore volumes and graphite float

Composite	Description	Initial Dry Volume (mL)	Final Wet Volume (mL)	Pore volume (mL)	Graphite Float (mL)
C101	Tailings Float #14	110	125	15	5
C102	Tailings Float #15	70	95	25	7
C103	Tailings Float #16	70	70	0	3
C104	Tailings Float #17	80	95	15	7
C105	Tailings Float #18	90	100	10	2

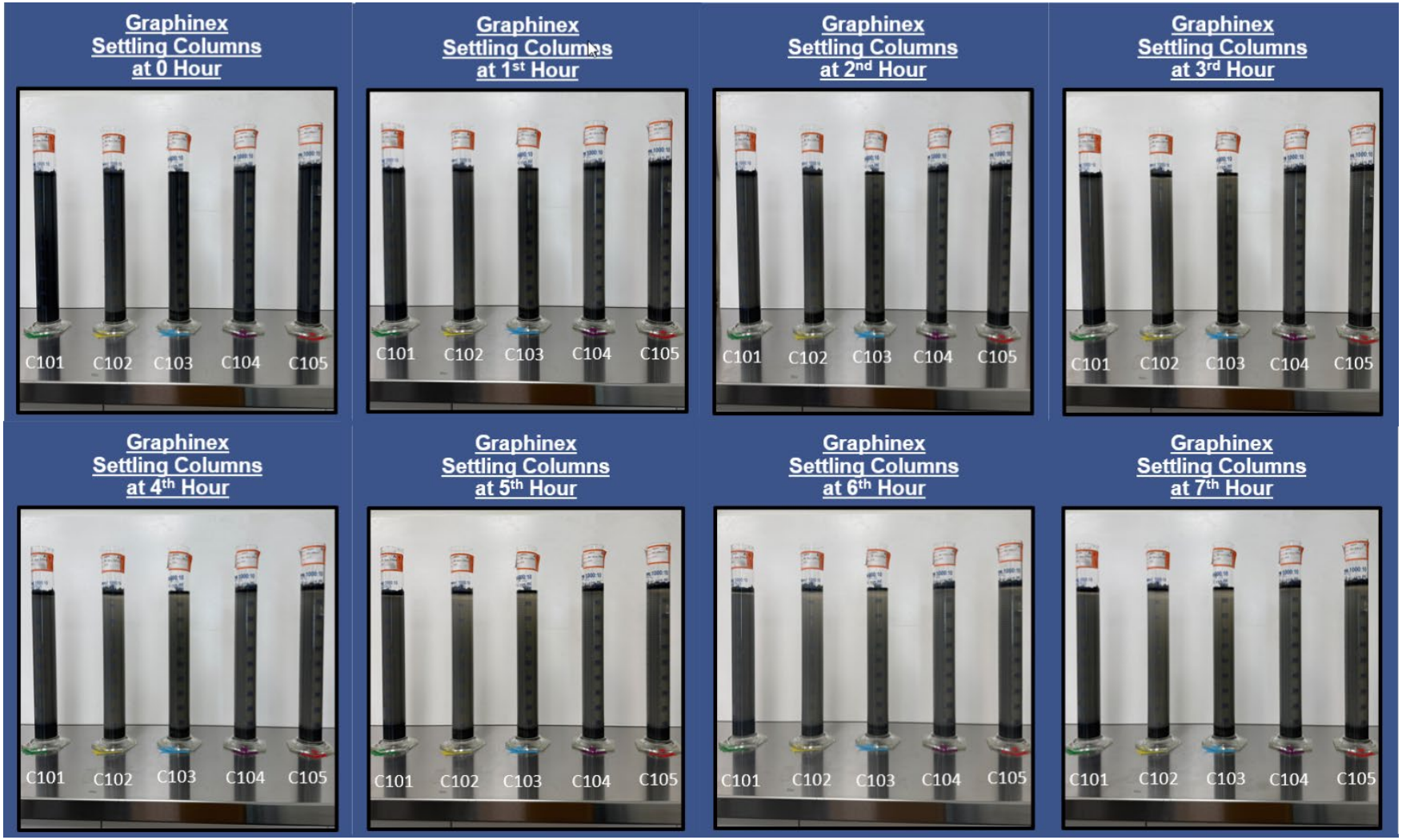


Figure 3-18: Column settlement photographs for tailings (0 to 7 hours)

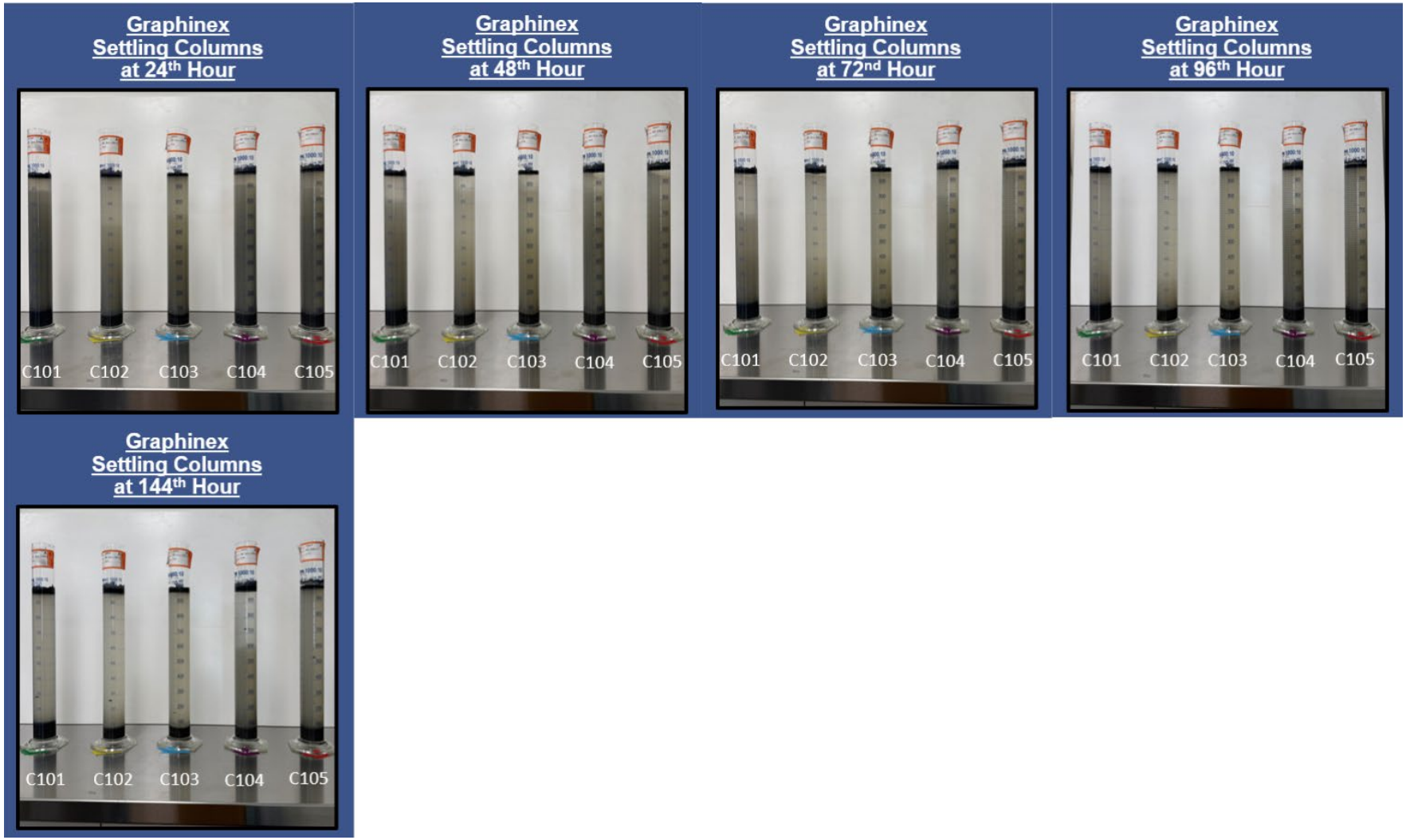


Figure 3-19: Column settlement photographs for tailings (24 to 144 hours)

3.4.6 Atterberg Limits

Batch 2 tailings samples (n=3) underwent analysis for Atterberg Limits. Based on PSD results (**Section 3.4.2**), the tailings are predominantly sand, although still contain a significant proportion of clay (15 to 16 %), which deemed them as potentially suitable for this test. Certificates from Trilab laboratory are included in **Attachment F**.

The results in **Table 3-23** verify that the tailings are non-plastic and therefore do not exhibit any shrink/ swell characteristics, and do not crack or curl upon drying. This is a good result, as non-plastic materials do not deform under applied stress, inferring that the tailings are naturally robust and stable. Non-plastic materials are preferred for construction purposes, such as embankments and foundations. The results from the Atterberg Limit testing are also significant when designing the engineered TSF.

Table 3-23: Atterberg limits for Batch 2 tailings samples

	2024066_001	2024066_002	2024066_003
	Tailings solid – Tank 1	Tailings solid – Tank 2	Tailings solid – Tank 3
Liquid Limit (%)	Non-obtainable	Non-obtainable	Non-obtainable
Plastic Limit (%)	Non-obtainable	Non-obtainable	Non-obtainable
Plasticity Index (%)	Non-plastic	Non-plastic	Non-plastic
Linear Shrinkage (%)	Non-obtainable	Non-obtainable	Non-obtainable
Cracking or curling	Neither	Neither	Neither

3.4.7 Permeability

Permeability (k) measures the flow of water through a substrate with a measured optimum moisture content. Low permeability materials (such as clays) may have application as liners to limit infiltration into or seepage from waste facilities, or from water storage dams into underlying sediments. Permeability is expected to increase as the soil compaction decreases due to an increase in void space between particles. Permeability ($k_)$) is expressed in m/s and can be measured by Falling Head (FHP) for finer materials or Constant Head (CHP) for coarser, gravelly soils. Low permeability clay-rich materials will usually have a permeability in the range 1 x 10^{-9} to 1 x 10^{-10} m/s. Silty materials are typically in the range of 1 x 10^{-8} m/s, sandy materials are typically 1 x 10^{-6} to 1 x 10^{-7} m/s, and gravelly materials usually have a permeability of 1 x 10^{-5} m/s or higher.

The composite tailings sample has a permeability (K_{sat} 90 % standard compaction) value of 2.6 x 10^{-6} m/s (**Table 3-24**), which is typical of a moderately coarse sand. The tailings would not be suitable as a reduced permeability layer in a cover design system, as water can infiltrate through these materials readily. The high permeability of the tailings suggests that the materials will drain quickly and are unlikely to retain water in a TSF. The tailings are expected to compact and quickly become stable compared to fine tailings that would have a higher proportion of clay and silt.

Table 3-24: Permeability results for composite Batch 2 tailings

RGS ID	k saturated value →	90% density ratio	Method
C106	Tailings solid composite (Batch 2)	2.6 x 10^{-6}	FHP

FHP = Falling Head Permeability; CHP = Constant Head Permeability

3.5 Kinetic geochemical testing

KLC data and results for the mine materials and Batch 2 tailings have been plotted on graphs contained in **Attachment C** and trends are discussed here. The laboratory certificates of analysis from ALS Laboratory are provided in **Attachment E.**

The KLC leachate concentrations are presented alongside ANZG (2018) water quality guideline values for freshwater aquatic ecosystems (95 % species protection) and livestock drink water quality. These guidelines are provided for context only and are not intended to be interpreted as “maximum permissible levels” for site water storage or discharge. It should be noted that the ratio of sample to water used in the KLC tests is typically ~4:1 (w/v), whereas the ratio of sample to water generally used in tests where results can (arbitrarily) be compared against guideline water quality concentrations to provide some context is more than an order of magnitude more dilute at 1:5 (w/v). Whilst arbitrary comparisons against guideline concentrations can be useful in some situations and help to provide some context, such comparisons cannot be directly extrapolated to the field situation at the project.

Results of the fourteen monthly leach events for KLC 1 to KLC 7 are discussed here. For information regarding the KLC composition, set up, and analyses, refer to **Section 2.1.7** and **Section 2.2.4**. The KLC program commenced in April 2025 and was completed in June 2026.

An in-progress illustration of the weathering of KLC 1 to KLC 6 after two months (leached under a free draining moisture regime) is provided in **Figure 3-20**. Fresh materials (waste rock, low grade ore, and ore body) typically do not show any signs of weathering and are comprised of coarse fragments. Soil and overburden are weathered and contain a mixture of particle sizes, including clay, silt, sand, and occasional gravel. The soil (KLC 1) and tailings (KLC 6) have little gravel and are finer than the other samples. Notwithstanding, there are no visible cracks or swelling that could be attributed to the presence of smectite clay.

Mineralogy results in **Section 3.2** indicate that smectite may be present in overburden. KLC testing confirms that the overburden has a strong tendency to shrink/swell compared to other material types. After seven months of leaching, there is some disintegration of the soil and overburden materials (KLC 1 and KLC 2), which appear to have an increased proportion of fine particles (**Figure 3-21**). After fourteen leach events, overburden (KLC 2) has become almost impermeable. KLC 4 and KLC 5 have some yellow discoloration at surface, while soil and tailings have become more orange (**Figure 3-22**). These colorations are due to iron and sulfide oxidation. In contrast, saturated tailings under reducing/ anoxic conditions (KLC 7) changed colour only slightly throughout the test period.

3.5.1 Acidity, alkalinity, and salinity

The key results from the KLC tests can be summarised in the following dot points:

- The pH of KLC 1 to KLC 7 is acidic to slightly alkaline (pH 2.8 to 8.7) and is generally lower in the low grade ore (KLC 4), ore body (KLC 5) and free leach tailings (KLC 6). The results correspond to some positive NAPP values predicted from static Acid Base Account testing.
- The pH results trend towards a value similar to the deionised water used in the KLC test, noting that the pH of the deionised water is 5.45 in Leach 2 and 5.83 in Leach 7. Soil, overburden, and waste rock (KLC 1 to KLC 3) do not add acidity to leachate water. These results indicate that pH values in pore water within overburden materials represented by the samples tested, if exposed to weathering conditions, are likely to remain within the pH neutral range.
- Low grade ore, ore body, and tailings materials (KLC 4 to KLC 6) in oxidising conditions add some acidity to leachate water, and this effect generally increases with time (i.e., a decreasing pH trend). Under anoxic conditions (KLC 7), the tailings maintain a steady pH and do not produce acidity.

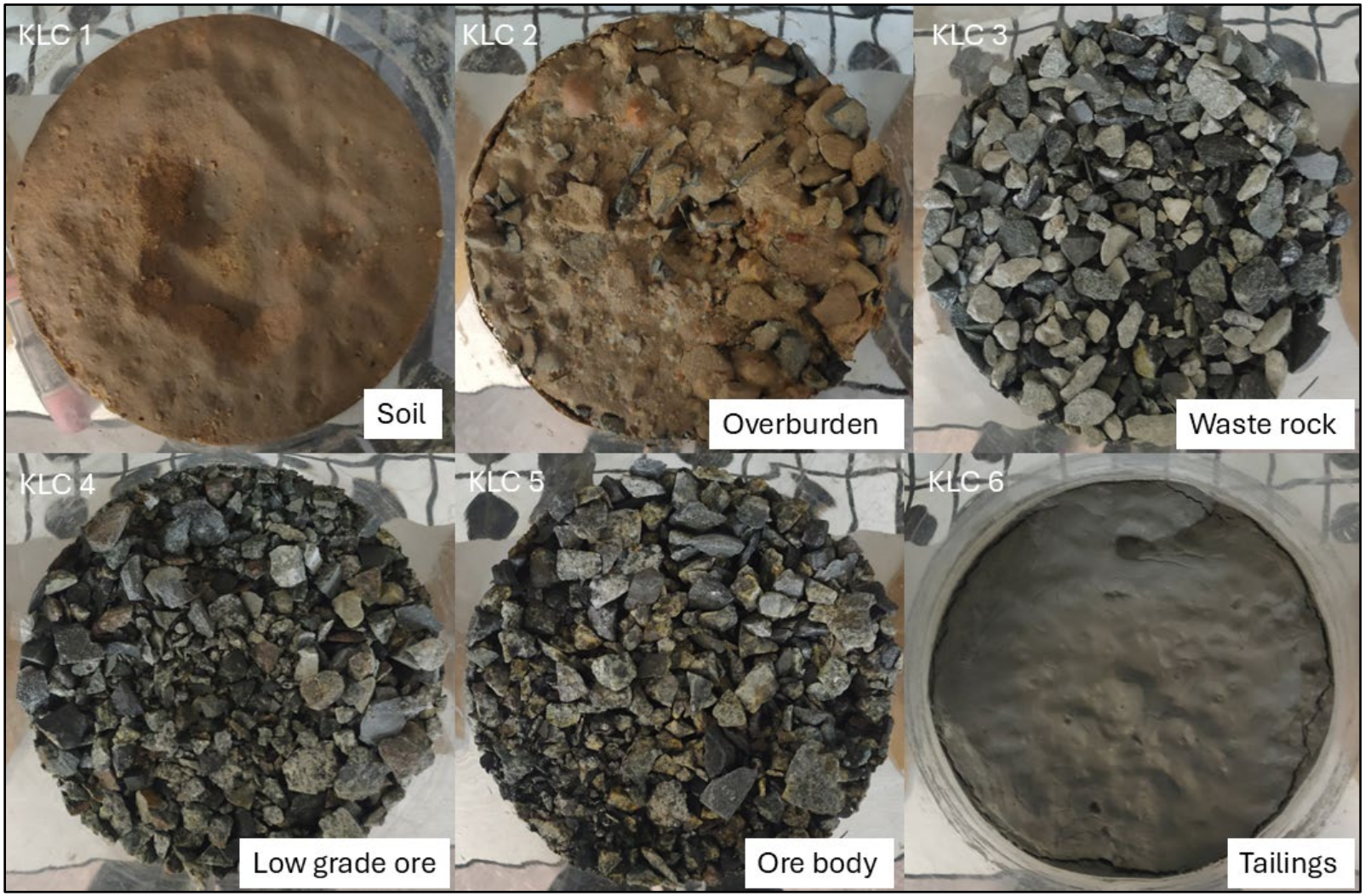


Figure 3-20: Illustration of Graphinex KLC 1 to KLC 6 after two leach events (29/05/2025)

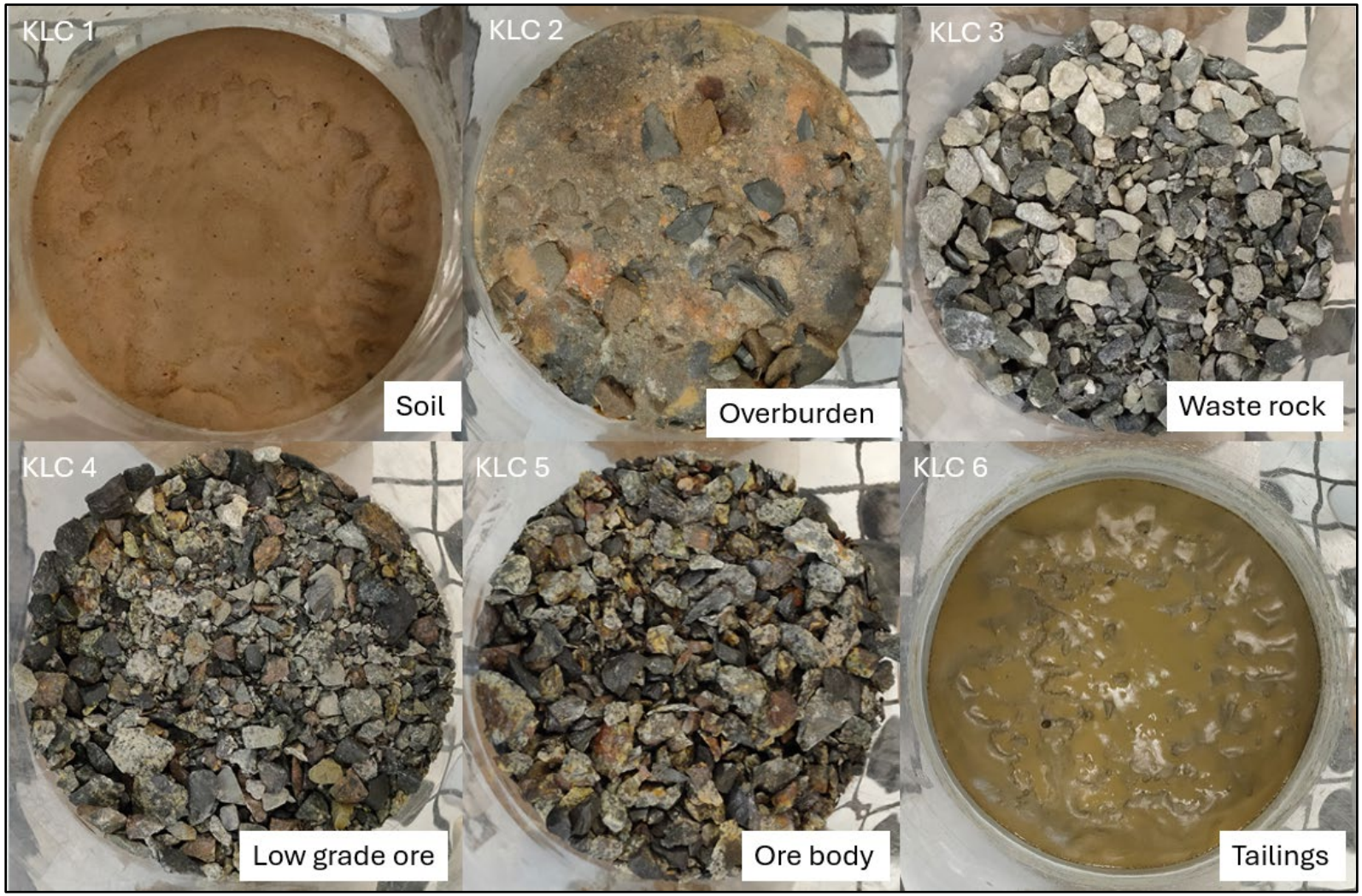


Figure 3-21: Illustration of Graphinex KLC 1 to KLC 6 after seven leach events (3/10/2025)



Figure 3-22: Illustration of Graphinex KLC 1 to KLC 6 after fourteen leach events (22/06/2026)

- The acidity measured in the KLC leachate is variable (<1 to 2,600 mg/L $CaCO_3$), and after fourteen leaches is <20 mg/L in soil, overburden, and waste rock (KLC 1 to 3) and saturated tailings (KLC 7). The acidity in low grade ore, ore body, and free leach tailings (KLC 4 to 6) is variable, peaking in leach 8 after an extended drying period and then slowly diminishing.
- Total alkalinity low to moderate (1 to 222 mg/L $CaCO_3$) over the fourteen leach events. Total alkalinity is highest in overburden (KLC 2) and waste rock (KLC 3) and lowest in ore body (KLC 5) and free leach tailings (KLC 6) materials.
- Low grade ore, ore body, and free leach tailings produce negative net alkalinity results after five to seven leach events, indicating a slow acid-generating reaction. The net alkalinity decreases the most rapidly in free leach tailings, which is likely due to the fine particle size. Soil has a net alkalinity value of -4 mg/L as $CaCO_3$ in leachate from the second event but is close to zero.
- Salinity can be as low as 22 µS/cm in soil (KLC 1) after fourteen leach events. The highest EC is produced from free leach tailings (KLC 6) during leach 8 (5,320 µS/cm). The EC values and the chloride and sulfate concentrations of the KLC leachates are generally higher in the tailings, and the first leach event usually contains the peak ('first flush') concentrations of salt (191 to 3,240 mS/cm).
- In low grade ore, ore body, and free leach tailings (KLC 4 to 6), EC values begin to increase a second time from leach seven onwards, which is accompanied by a rise in concentrations of calcium (Ca^{2+}) and sulfate (SO_4^{2-}) salts. This trend corresponds to decreasing pH values. The presence of sulfate is consistent with the higher levels of sulfur detected in the low grade ore, ore body, and tailings.
- In soil, overburden, and waste rock (KLC 1 to 3), the main contributing ions to salinity are sodium (Na^+) and chloride (Cl^-). The decreasing concentration trend in most major ion concentrations reflects the flushing of soluble salts from the materials and is expected to continue over time.
- Sulfate concentrations range from 2 to 3,710 mg/L and are higher in low grade ore, ore body, and tailings materials (KLC 4 to KLC 7). Free leach and saturated columns of tailings initially leach similar concentrations of sulfate over the first two leach events. After fourteen leach events, the concentration of sulfate in saturated tailings is relatively low. An opposing trend is observed for free leach tailings.
- The concentration of sulfate in leachate from the KLC tests has been used to calculate the residual sulfur content and sulfate generation rate of the materials. The mine materials and tailings retained at least 71.4 % of their inherent total sulfur content after fourteen leach events. Similarly, the concentrations of dissolved calcium and magnesium in leachate from the KLC tests have been used to calculate the residual ANC, which indicates that at least 75.2 % of the inferred inherent ANC value was retained within the sample matrix after the fourteen leach events. These results verify that the risk of acid generation in the short to medium term is likely to be low to moderate.
- The sulfate generation rate results obtained for the KLC tests has been used to determine the rate of sulfide oxidation for the mine materials and tailings over the fourteen leach events. The calculations conservatively assume that all sulfate released is due to sulfide oxidation. Most sulfate salts generated from sulfide reaction involving materials with a very low sulfur concentration are highly soluble and therefore will be collected in column leachate. The dissolved sulfate (and calcium) concentrations in the KLC 1 to KLC 7 leachates are typically less than the solubility limit of gypsum ($CaSO_4$), which indicates that sulfate generation is not currently controlled by gypsum dissolution in the test materials.
- The average rate of sulfide oxidation and the average sulfate generation rate for KLC 1 to KLC 7 calculated over the initial test period are summarised in **Table 3-25**.

Table 3-25: Sulfate generation and sulfide oxidation rates for KLC tests

KLC Sample Number	Sample Description	Sulfate Generation Rate (mg/kg/week)	Oxidation Rate (kg $O_2/m^3/s$)
KLC 1	Soil: NAF - B (free draining)	0.4	1.3×10^{-10}
KLC 2	Overburden: NAF - B (free draining)	1.6	6.9×10^{-10}
KLC 3	Waste Rock: NAF - B (free draining)	1.5	8.4×10^{-10}
KLC 4	Low Grade Ore: NAF - B/ PAF (free draining)	6.9	4.4×10^{-9}
KLC 5	Ore body: NAF/ PAF (free draining)	9.1	5.8×10^{-9}
KLC 6	Tailings: PAF (free draining)	113.5	3.7×10^{-8}
KLC 7	Tailings: PAF (saturated)	22.2	7.5×10^{-9}

The sulfate generation rate ranges from 0.4 to 113.5 mg/kg/week for the KLC composite samples, indicating that the rate of sulfate generation in these materials is typically low to moderate. The equivalent sulfide oxidation rate for these samples ranges from 1.3×10^{-10} to 3.7×10^{-8} kg $O_2/m^3/s$. These rates are consistent with the static geochemical testing (**Section 3.1**) which showed a low to moderate sulfur content in the samples.

Mining waste materials with an oxidation rate less than 1×10^{-8} kg $O_2/m^3/s$ and a moderate inherent ANC have an increased factor of safety and are likely to generate leachate that are neutral (AMIRA, 2002; Bennett et al., 2000). All of the mine material samples (excluding tailings) fall into this category. The results to date indicate that tailings are higher risk than the other materials, and under free draining conditions can generate a leachate that is weakly acidic from leach seven onwards. The free leach tailings are likely to have reached a steady state at pH 2.8 after fourteen leach events, although peak solute concentrations generally occur at around 40 weeks (nineth leach).

Overall, the KLC results reflect the range of material characteristics predicted from the static geochemical test results described in **Section 3.1.**

3.5.2 Kinetic soluble metals/ metalloids

The concentration of dissolved metals/metalloids in leachate from the columns is typically low with the majority of leached metals/metalloids below the laboratory LoR. However, there are several metals/ metalloids with concentrations that would be considered slightly elevated for some of the column leachate samples compared to applied water quality guidelines (ANZG 2018):

- Concentrations of fluoride (F) in leachate collected some of the sample materials (especially overburden) can be above the applied livestock drinking water guideline value of 2.0 mg/L (ANZG, 2018). The alluvium soil (KLC 1) has the lowest fluoride concentration. Notwithstanding, the ratio of solid to liquid in the KLC tests is high (typically ~4:1 (w/v)) and reflects pore water concentrations in some materials. In addition, in Queensland, higher concentrations of fluoride have been detected in groundwater, and are associated particularly with igneous rocks.
- Most mine materials have concentrations of dissolved aluminium (Al) that are above freshwater aquatic ecosystems criteria (95 % species protection level) of 0.055 mg/L (ANZG, 2018). Concentrations are generally below the livestock drinking water criteria value of 5 mg/L after fourteen leach events and diminish over the leaching period. However, in ore body and free leach tailings (KLC 5 and 6), aluminium concentrations begin to increase once pH falls below 4, and rise steadily over time. In contrast, saturated tailings typically have low concentrations of dissolved aluminium. It should be noted that aluminium in fine materials can pass through the laboratory filtration step in a colloidal form and this phenomenon may contribute to the apparent dissolved aluminium concentration (**Attachment L**).
- Dissolved arsenic (As), cadmium (Cd), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), uranium (U), and zinc (Zn) concentrations in leachate collected from the mine material and

tailings samples can be marginally above the applied freshwater aquatic ecosystems criteria (95 % species protection level) but are typically well below recommended livestock drinking water levels (ANZG, 2018) in all but the ore body (KLC 5) and free draining tailings (KLC 6). The mobility of these metals/metalloids is greater under acidic conditions and increases towards the end of the test period, aligning with pH trends.

- Overburden materials (KLC 2) can produce concentrations of molybdenum (Mo) and selenium (Se) that are above livestock drinking water criteria of 0.15 mg/L and 0.02 mg/L, respectively. These trace metal/metalloids are typically associated with neutral metalliferous drainage (NMD), rather than AMD. Concentrations peak in the third leach event and then diminish and should not persist in the long term.
- Dissolved boron (B) concentration in the initial leachates collected from tailings is typically above the freshwater aquatic ecosystems criteria (95 % species protection level) guideline value of 0.37 mg/L (ANZG, 2018). This metalloid is generally low in the ore body materials, but can be higher in overburden and waste rock.

The KLC tests results align will with static water extract leach concentrations discussed in **Section 3.1.9**. Dissolved metal/ metalloid concentrations are typically highest in the third or eighth leach event and generally decrease in subsequent leach events. Slow reacting acidity and a decrease in pH was observed in low grade ore, ore body, and free leach tailings (KLC 4 to KLC 6), accompanied by a gradual increase in most metal/metalloid concentrations. These materials appear to have reached a steady state, with only slight variability in pH between leach 8 and leach 14.

Overall, the results indicate that most dissolved metal/ metalloid concentrations, with the exception of those listed above, are low and are expected to pose a low level of risk to any surface runoff and seepage. Water management will be required to collect surface runoff and seepage from low grade ore, ore body stockpiles, and freely oxidising tailings stored in the medium to long term. As the materials have an extended lag period before becoming acidic, short term storage (i.e., three months or less) of these materials has a relatively low risk for AMD.

3.5.3 Kinetic soluble hydrocarbons assessment

This section includes the results and a discussion of the carbon and organic components of the mine materials and Batch 2 tailings released during kinetic leach testing. Static total carbon results for solid mine materials and tailings are presented in **Figure 3-5**. A full static carbon suite (total, organic, and inorganic) was measured in supernatant in **Section 3.1.4**, alongside TPH/TRH and BTEXN in supernatant and water extracts in **Section 3.1.10**. TPH/TRH kinetic analyses are discontinued from leach 12, as all results are below LOR. All geochemical testing was performed by ALS and laboratory certificates are available in **Attachment E**.

3.4.3.1. TOC in kinetic soluble water extracts

Total organic carbon (TOC) is organic carbon in aqueous solution, including dissolved organic carbon that passes through a 0.45 µm filter. The dissolved fraction is most likely to affect aquatic fauna and flora. The TOC fraction excludes graphite, which reports as inorganic carbon.

TOC was measured in mine materials and tailings in the kinetic leach data (**Table 3-26**). TOC in mine materials is naturally occurring, whereas TOC in the tailings is likely to be sourced from processing reagents (e.g., flotation reagent). The TOC concentration in mine materials (particularly ore body) provides a baseline comparison for the addition of process reagents.

The results in **Table 3-26** verify initial flushing of TOC in the first three leach events, followed by a general decrease over the test period. This is true for both mine materials and tailings. Soil (KLC 1) contains the highest natural concentration of TOC (82 mg/L in L3), whereas the low grade ore (KLC 4) and ore body materials (KLC 5) contain very low TOC. In tailings, the TOC is approximately two to three times the concentration that is naturally occurring in the ore body. However, these values are still well below the measured TOC for soil and therefore are unlikely to have a significant environmental impact on contact water.

Table 3-26: Kinetic TOC in leachate for mine materials and tailings

KLC	Unit	KLC Leach (4:1 w:v) – free draining, except KLC 7													
		All concentrations mg/L													
		L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14
1	Soil	40	27	82	26	17	16	13	23	17	13	10	10	8	6
2	Overburden	3	2	4	4	2	2	2	2	2	2	3	3	<1	2
3	Waste rock	6	2	2	3	2	1	2	3	3	2	2	1	<1	<1
4	Low grade ore	8	1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1
5	Ore body	5	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1
6	Tailings	12	3	3	2	1	2	5	9	6	3	3	3	2	2
7	Tailings (saturated)	10	5	4	4	3	3	2	4	2	2	2	2	<1	2

3.4.3.2 TPH/TRH in kinetic soluble water extracts

Static TPH/TRH concentrations are presented in **Section 3.1.10**. In the mine materials, TPH can come from both natural and anthropogenic sources. However, as the land (prior to mining) is relatively undisturbed, contamination from oil spills, petrol, and wastewater is unlikely. Natural sources of TPH are usually attributed to the degradation of organic matter and thus are typically highest in soil. For the tailing composites, the main processing chemical is a collector-frothing reagent.

Soluble (unfiltered) TPH concentrations of mine materials in a static leach compared to the kinetic test program are presented in **Table 3-27** to **Table 3-29**. These concentrations provide natural background levels of soluble organic materials, prior to processing. The results demonstrate that low concentrations of C10-C14 hydrocarbons are naturally occurring and are highest in soil (KLC 1) and low grade ore (KLC 4). Concentrations of C15-28 and C29-36 are typically below the LoR in natural mine materials.

Volatile TPH/TRH (C6-C9) hydrocarbons were included in the KLC analysis suite. While these compounds are typically the most toxic to aquatic life, detected concentrations in all of the mine materials and tailings over the seven leach events were below LoR. It is assumed that short-chain compounds are (or were) present and that their exposure time in the disposal process would be very limited.

Soluble TPH in tailings (KLC 6 and KLC 7) are well above those measured in natural mine materials. In the short chain C10-C14 fraction, the concentration of TPH (450 µg/L) is slightly higher than in ore body materials (230 µg/L) (**Table 3-27**). The concentration of TPH in the C10-C14 fraction will include some contribution from the organic flotation reagents. Nevertheless, these concentrations are typically below the natural concentrations recorded for soil (KLC 1).

In the C15-C28, the TPH concentration in tailings is approximately five to ten times greater than the naturally occurring concentration in soil (**Table 3-26**). These medium to long chain organic compounds are likely to have been contributed from organic flotation reagents and may have some environmental impact if contact water is left unmanaged. Fortunately, these compounds are semi-volatile, and their concentration can be reduced through management practices by the effect of sunlight through photodegradation. A soil cover can also act as a sink for these compounds, which are then adsorbed and degraded by sunlight.

Very long chain TPH (C29-36 fraction) are generally less-volatile or non-volatile and are more difficult to manage (**Table 3-29**). The concentration of these compounds is close to the LoR in both the mine materials and tailings and thus is unlikely to pose a significant environmental risk.

The TPH concentrations in the tailing composites show a slight increase in the C10-C14 fraction above background levels, as well as an increase in the C15-C28 fraction. Concentrations in the C10-C14 and C15-C28 appear to increase slightly in L8 after an extended 2-month drying period. Very long chain hydrocarbons (C29-C36) are close to or below LoR in the tailings. Short chain aliphatic alcohols (C6-C10) will likely volatilize, leaving behind a mixture of esters, ethers, alkanes, aromatics, and C12-C15 alcohol that may have some solubility. While kinetic results demonstrate that the concentration of medium to long chain TPH diminishes quickly, it is recommended that C15-C28 hydrocarbons are included in the groundwater monitoring program.

Note: Hydrocarbons were not measured in L4 due to a sampling error. Analyses were discontinued in KLC 2 to KLC 5 in Leach 4 and KLC 1, KLC 6, and KLC 7 in Leach 12 after concentrations fell below the LoR.

Table 3-27: Static and kinetic concentrations of TPH in mine materials and tailings (C10-C14)

KLC	Material type	Static leach (1:5 w:v)	KLC Leach (4:1 w:v)										
		Concentrations in µg/L											
			L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
1	Soil	90	550	120	60	-	60	<50	<50	210	<50	<50	<50
2	Overburden	50	120	60	<50	-	-	-	-	-	-	-	-
3	Waste rock	70	360	80	<50	-	-	-	-	-	-	-	-
4	Low grade ore	85	380	80	<50	-	-	-	-	-	-	-	-
5	Ore body	60	230	70	<50	-	-	-	-	-	-	-	-
6	Tailings	100	450	120	80	-	<50	90	60	390	60	<50	<50
7	Tailings (saturated)		380	280	160	-	<50	60	60	<50	<50	<50	<50

Table 3-28: Static and kinetic concentrations of TPH in mine materials and tailings (C15-C28)

KLC	Material type	Static leach (1:5 w:v)	KLC Leach (4:1 w:v)										
		Concentrations in µg/L											
			L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
1	Soil	<100	150	370	140	-	200	170	170	680	160	100	<100
2	Overburden	<100	<100	130	<100	-	-	-	-	-	-	-	-
3	Waste rock	<100	<100	<100	<100	-	-	-	-	-	-	-	-
4	Low grade ore	<100	170	<100	<100	-	-	-	-	-	-	-	-
5	Ore body	<100	<100	<100	<100	-	-	-	-	-	-	-	-
6	Tailings	220	1860	440	150	-	<100	<100	<100	220	<100	<100	<100
7	Tailings (saturated)		1580	1120	620	-	190	230	210	130	100	<100	120

Table 3-29: Static and kinetic concentrations of TPH in mine materials and tailings (C29-C36)

KLC	Material type	Static leach (1:5 w:v)	KLC Leach (4:1 w:v)										
		Concentrations in µg/L											
			L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
1	Soil	<50	<50	300	<50	-	<50	<50	<50	<50	<50	<50	<50
2	Overburden	<50	<50	<50	<50	-	-	-	-	-	-	-	-
3	Waste rock	<50	<50	<50	<50	-	-	-	-	-	-	-	-
4	Low grade ore	<50	<50	<50	<50	-	-	-	-	-	-	-	-
5	Ore body	<50	<50	<50	<50	-	-	-	-	-	-	-	-
6	Tailings	<50	70	<50	<50	-	<50	<50	<50	<50	<50	<50	<50
7	Tailings (saturated)		60	50	<50	-	<50	<50	<50	<50	<50	<50	<50

3.5.4 Eh record sheet

The redox probe summary, provided in **Table 3-30**, verifies that the saturated column (KLC 7) maintains the tailings composite under reducing (Eh negative) conditions. When first set up (9/04/2025), KLC 7 is oxidising (Eh positive). Over time the course of the day, the conditions become more reducing. When the leach is collected (15/04/2025), the Eh is negative. These reducing conditions are then maintained over the test period and throughout the twelve leach events.

Table 3-30: Redox probe (Eh) summary

Eh Record					
2024066	Graphinex Saturated Tailings (KLC 7)				
Date	Meter	initials	Water	Redox Potential (mV)	Other
9/04/2025	MWQM_DL_02	KG	DI	204	10:20am
9/04/2025	MWQM_DL_02	KG	DI	208	11:20am
9/04/2025	MWQM_DL_02	KG	DI	205	12:40am
9/04/2025	MWQM_DL_02	KG	DI	205	1:40pm
9/04/2025	MWQM_DL_02	KG	DI	204	2:40pm
9/04/2025	MWQM_DL_02	KG	DI	196	3:40pm
10/04/2025	MWQM_DL_02	KG	DI	175	
11/04/2025	MWQM_DL_02	KG	DI	69	
14/04/2025	MWQM_DL_02	KG	DI	-15	
15/04/2025	MWQM_DL_02	KG	DI	-40	Before leach
16/04/2025	MWQM_DL_02	KG	DI	-56	During Leach
17/04/2025	MWQM_DL_02	KG	DI	-67	After Leach
16/05/2025	MWQM_DL_02	PH	DI	-257	Before leach
14/05/2025	MWQM_DL_02	PH	DI	-185	During Leach
15/05/2025	MWQM_DL_02	PH	DI	-253	After Leach
9/06/2025	MWQM_DL_02	KG	DI	-294	Before leach
10/06/2025	MWQM_DL_02	KG	DI	-298	During leach
11/06/2025	MWQM_DL_02	KG	DI	-304	After leach
7/07/2025	MWQM_DL_02	KG	DI	-181	Before leach
8/07/2025	MWQM_DL_02	KG	DI	-191	During leach
9/07/2025	MWQM_DL_02	KG	DI	-261	After leach
5/08/2025	MWQM_DL_02	KG	DI	-312	Before leach
6/08/2025	MWQM_DL_02	KG	DI	-315	During leach
7/08/2025	MWQM_DL_02	KG	DI	-219	After leach
4/09/2025	MWQM_DL_02	KG	DI	-194	After leach
3/10/2025	MWQM_DL_02	KG	DI	-248	After leach
17/12/2025	MWQM_DL_02	AF	DI	-341	After leach
21/01/2026	MWQM_DL_02	AF	DI	-347	After leach
18/02/2026	MWQM_DL_02	AF	DI	-348	After leach
18/03/2026	MWQM_DL_02	AF	DI	-344	After leach
16/04/2026	MWQM_DL_02	AF	DI	-302	After leach

4 Discussion

The geochemical characteristics of mine materials and tailings tested in this assessment are summarised in this section along with their potential uses and some preliminary material management strategies.

4.1 Soil

Based in the available dataset, soil materials may be mildly acidic (pH 5 to 6) and have very low salinity. Soil has negligible sulfur content and a low acid neutralising capacity and is classified as NAF-Barren. In kinetic tests, soil can leach mildly elevated concentrations of aluminium, cadmium, copper, lead, and zinc, which originate from mineralised parent rock materials. NORM results for soil are below the instrumentation detection limit.

Classification: Beneficial. NAF-Barren.

Management: Likely to be suitable as a rehabilitation growth medium.

4.2 Overburden

The overburden is comprised of several sedimentary lithologies – claystone, sandstone, and siltstone, and may be bedded or massive. The materials are expected to be slightly alkaline and have low salinity. The total sulfur content of these materials typically negligible, and higher concentrations are likely to be in an oxidised form as gypsum ($CaSO_4$). Acid neutralising capacity is generally low to moderate, and all but one of the samples classify as NAF-Barren. Soluble fluoride concentrations are high in overburden compared to other material types. In alkaline pH conditions, some overburden materials can produce elevated concentrations of aluminium, molybdenum, and selenium in the initial flush events, which is associated with neutral mine drainage (NMD). However, the concentrations of these metals/metalloids will typically decrease over time and are not expected to persist in the long term. NORM concentrations are below screening levels and about half that found in the ore body. Overburden materials are highly weathered and may be unconsolidated. The materials contain smectite clay and have moderate to strong shrink/swell characteristics.

Classification: Beneficial. NAF-Barren.

Management: Likely to be suitable as a bulk fill or cover material. No AMD management required if used as backfill or placed into out-of-pit dumps. May produce NMD when initially exposed, concentrations expected to diminish and produce good water quality in the medium to long term.

4.3 Waste rock

Waste rock is defined in this project as dolerite or metasediments with <3 % total carbon and located within the granite ore body. The materials are typically fresh and consolidated, although some weathered materials may occur at shallower depths near the ore body – overburden boundary. The materials are alkaline and have negligible total sulfur. Acid neutralising capacity in waste rocks is generally higher than in overburden materials and is typically moderate. The samples classify as NAF-Barren and are pH neutral. Waste rock can initially produce slightly elevated concentrations of fluoride, aluminium, and copper that diminish over time. NORM concentrations are higher in waste rocks compared to other material types, but do not pose a significant threat to human health or to the environment.

Classification: Beneficial. NAF-Barren.

Management: Likely to be suitable as a bulk fill or cover material. No AMD management required if used as backfill or placed into out-of-pit dumps. Potential to be used as competent rock for rehabilitation purposes.

4.4 Low grade ore

Low grade ore is defined in this project as granite breccia with <3 % total carbon. Graphinex plans to stockpile the 2-3% TGC low grade ore material to process at the end of the mine life, with the intent to extend onsite operations and extract economic value from ore. The pH of the low grade ore is variable but is typically slightly alkaline and salinity is typically low. Acid neutralising capacity is generally low to moderate. From the eight samples, six were classified as NAF-Barren, one was NAF, and the other was PAF. Lower pH values were associated with the NAF and PAF samples, and these samples tended to have higher total carbon content between 2 to 3 % (i.e. borderline between low-grade ore and ore).

Kinetic leaching of the low grade ore materials demonstrate that leachate will eventually become weakly acidic with successive leaching events. Concentrations of pH-sensitive metals/metalloids aluminium, cadmium, copper lead, nickel, and zinc are above criteria for freshwater aquatic ecosystems (95% species protection level) (ANZG, 2018), but are well below livestock drinking water quality standards and typically diminish over time. NORM concentrations are slightly lower than waste rock materials.

Classification: Low to moderate risk waste. Mostly NAF-Barren or NAF, occasionally PAF.

Management: If not processed, low grade ore may be suitable as backfill or for placement in the central core of a backfilled void.

4.5 Ore body

The ore body pH values range from circumneutral to slightly alkaline and lower pH values are associated with higher total sulfur and total carbon content. Only 4 of the 42 ore body samples have negligible total sulfur and moderate to high acid neutralising capacity. The majority of ore body samples have low neutralising capacity and some acid potential.

It is worth noting that the static pH of the ore body samples is circumneutral but is not acidic, implying that the initial contact water will be pH neutral. The elevated total sulfur content and low ANC of the ore materials classify most of these materials as PAF. Mineralogical studies confirm that sulfide sulfur (S^{2-}) reports mostly to the amorphous (very fine) fraction of particles and that the speciation of the sulfur is likely a mixture of pyrrhotite and elemental sulfur, rather than pyrite. It is known from literature studies that acid generation from the oxidation of pyrrhotite is slower than pyrite, as pyrrhotite has two possible reaction pathways (**Section 1.5.2**). One of these pathways generates sulfuric acid, while the other forms elemental sulfur. The reaction kinetics were tested in the laboratory and it was confirmed that slow acid generation can occur from ore body materials under freely oxidising conditions.

Ore body materials are classified as granite breccia (with xenoliths) or metasediments with >3 % total carbon. As fresh rocks, ore body materials are typically coarse and have limited surface area for pyrrhotite oxidation reactions to occur. Therefore, despite elevated sulfide sulfur content (2 to 3%) in some ore body materials, they are less reactive than tailings. As the total sulfur content appears to correlate with total carbon, higher grades of graphite are expected to have a higher geochemical risk. There may also be a correlation between total sulfur and depth, as shown in **Figure 4-1**, which may influence any future potential mine planning to deepen the open pit.

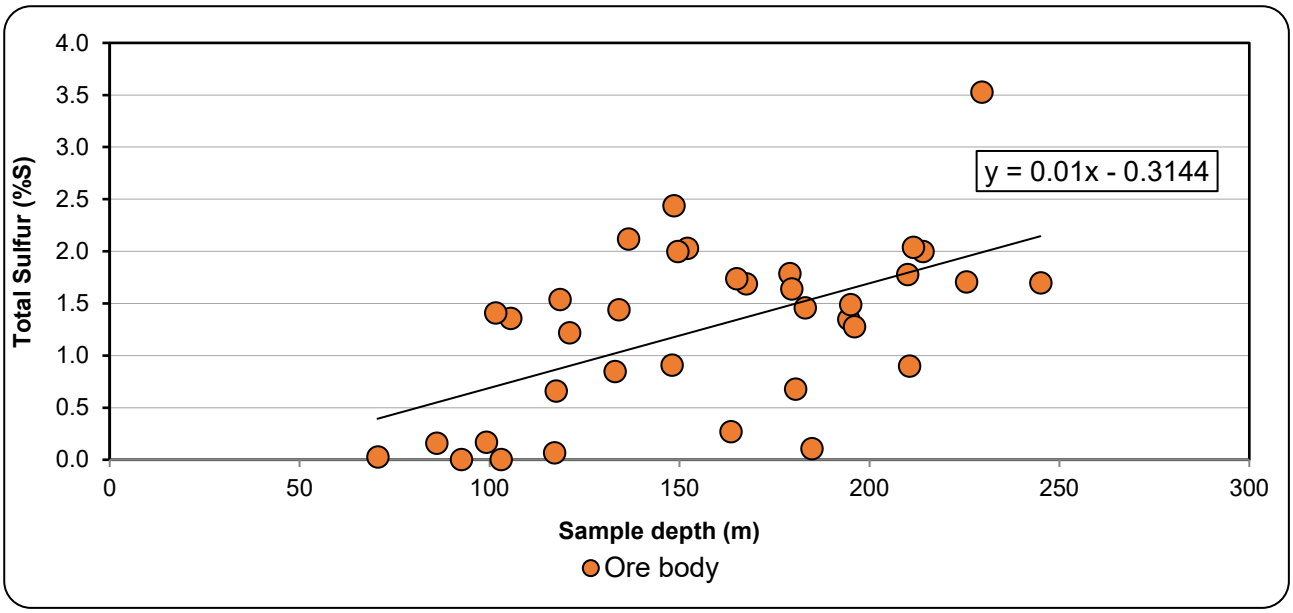


Figure 4-1: Relationship between total sulfur and depth within ore body materials

The containment of higher risk materials within the ore body presents some advantages. All of the higher risk ore material will be processed into tailings that can then be backfilled into the open pit void. Overburden, waste rock, and soil can be placed as bulk fill over the processed tailings to manage the ingress of water infiltration and minimise the oxidation of pyrrhotite. Deep burial, combined with a well-designed rehabilitation cover can effectively mitigate the key components of potential acid generation from the tailings. Laboratory testing confirms that metal/metalloid concentrations will increase if leachate water quality falls below pH 6.

The ore body (and tailings) are classified as PAF, although initial reaction kinetics are slower than would typically be expected for acid generating materials. NORM concentrations are slightly lower than waste rock materials.

Classification: Moderate risk material. Occasional samples are NAF-Barren or NAF, although the majority are PAF-LC or PAF.

Management: Likely to be processed as ore to generate a graphite concentrate and tailings that will be disposed as backfill. Water management at ROM ore stockpiles required. Unsuitable as a bulk fill material or surface layer.

4.6 Tailings

The static geochemical results for the tailings samples are similar to the averaged properties of the ore body materials. Processing steps (e.g., grinding and flotation) have an impact on particle size, which will increase the reactivity of tailings compared to natural ore.

The tailings are slightly alkaline with low salinity, and low acid neutralising capacity. The majority of tailings samples are classified as PAF. NAG testing also confirms that the tailings are likely to be PAF. The concentration of sulfide sulfur was relatively low in one sample classified as Uncertain, although the low neutralising capacity is consistent across all the samples. Based on the alkaline pH values, it is likely that some of the inherent sulfide sulfur is slow to react, or less reactive than those typically associated with pyrite minerals. As discussed in **Section 4.5**, the expert determined that the sulfur is in the form of pyrrhotite and elemental sulfur.

Comparing the Batch 1 and Batch 2 tailings, all initially produce a neutral pH and are classified as PAF. Seepage is moderately saline, which is typical for tailings. The later tailings are slightly more saline and have higher ANC, which is likely due to variation in the ore feed, rather than as a result of processing. The static total carbon in the Batch 2 tailings is lower than in the Batch 1 tailings, which may indicate an improvement in graphite recovery and the use of MIBC rather than turpentine as a frother. NORM concentrations in tailings are slightly lower than waste rock and ore body materials.

Initial contact water may contain slightly elevated concentrations of aluminium, although all other metal/metalloid concentrations are expected to be low. If the tailings are left unmanaged and allowed to oxidise, several metals/metalloids, including aluminium, boron, cadmium, copper, lead, manganese, nickel, and zinc can mobilise into pore water under acidic conditions (stabilising at pH 2.8).

Leachate produced by the Batch 2 tailings under saturated (anoxic) conditions maintains a neutral pH and lower concentrations of metal/metalloids. Concentrations of soluble hydrocarbons (sourced from flotation reagents) in tailings are initially above background soil but then diminish rapidly.

In terms of physical properties, the Batch 2 tailings have lower bulk density, and a higher proportion of clay and silt than the Batch 1 tailings. The Batch 2 tailings demonstrate a refinement in the process circuit and improved crushing and grinding steps, and are more representative of the bulk tailings likely to be produced at the Project. However, all of the tailings tested behave predominantly as a sand. They are likely to be permeable, to drain quickly, and have low water retention characteristics. The tailings are classified as Emerson Class 3 or 4 and are expected to have good structure and stability, with limited shrink / swell behaviour. In KLC testing, the tailings drained quickly compared to overburden materials, confirming these physical characteristics.

Classification: Moderate to high risk material. Classified as PAF.

Management: Disposal into the backfilled void with a waste rock cover and soil capping is the recommended AMD management strategy. Preferably inundated with groundwater. Tailings are unsuitable as a bulk fill material or surface layer without treatment.

5 Conclusions

The key findings of the static and kinetic geochemical assessment of mine material and tailings are:

- Soil, overburden, and waste rock mine materials typically have low total sulfur content, low to moderate ANC, and most are classified as NAF-Barren. These materials have a negligible risk of acid generation and a high factor of safety with respect to potential for acidic drainage.
- Overburden and waste rock materials are suitable to be disposed as backfill or in out-of-pit waste rock dumps and will not require management for acidic drainage. However, in oxidising conditions overburden can produce neutral metalliferous drainage (NMD), resulting in slightly elevated concentrations of F, Mo, and Se, which should be included in the water monitoring program.
- Low grade ore materials from within the granite ore body are also typically classified as NAF-Barren, although some samples with between 2 and 3 % total carbon can be classified as PAF based on sulfide sulfur values. Material identified as PAF will be processed at the end of the mine life to extract economic value.
- Based on total and sulfide sulfur content, ore body materials with >3 % total carbon typically classify as PAF-low capacity or PAF. A small proportion (approximately 10 %) of these samples are NAF-Barren or NAF. These materials will be processed as ore and will require water management at the ROM stockpile.
- Tailings are classified as PAF and will require management. The materials could be disposed into the base of the open pit void as backfill and then covered with waste rock and soil capping to minimise potential acid generation and seepage. Groundwater recovery may provide anoxic conditions.
- Batch 1 tailings were produced in early bench scale testing using turpentine and diesel flotation/collector reagents, whereas Batch 2 tailings are the result of a refined process using MIBC and diesel. The Batch 2 tailings contain a greater proportion of clay and silt and are considered more representative.
- NORM testing demonstrates that the leachate collected from waste rocks, ore body, and tailings can be slightly above screening levels of 0.5 Bq/L. In solid materials, this relates to the granitic source materials, which can produce radionuclides in the U-238 decay series. Concentrations are low on a regional scale.
- The presence of sulfide within the ore body and tailing materials may result in a slower than predicted rate of acid generation potential/capacity as currently calculated through standard static geochemical test techniques.
- Kinetic geochemical and mineralogical testing show that the sulfur in these materials is present as pyrrhotite and elemental sulfur, rather than pyrite. Acidic leachate was first produced from oxidised PAF tailings after five monthly leach events, verifying that these materials are more reactive than ore body due to fine particle size.
- Discrepancies in the XRD data over sulfide forms (pyrite or pyrrhotite) are confirmed to be pyrrhotite and elemental sulfur. This is evidenced by magnetic properties of the core material and slower than expected initial acid generation rates demonstrated in kinetic testing.
- Solid mine materials and tailing samples may have some enrichment in Cu, Mo, Re, S and Te compared to the median crustal abundance in unmineralised soils.
- Initial static water extracts of the mine materials are typically alkaline and produce low concentrations of dissolved sulfate, at least one order of magnitude lower than livestock drinking water guideline criteria (ANZG 2018). Dissolved fluoride concentrations can be slightly elevated in overburden and ore body materials.
- Dissolved trace metal/metalloid concentrations in initial contact water (1:5 w:v) are generally below detection limits, although concentrations of Al, As, and Zn can be marginally above freshwater aquatic ecosystem (95% protection level) trigger values in some mine materials (ANZG 2018).
- Long term kinetic leaching studies confirm that acid production is generally slow in low grade ore and ore body materials, but will increase over time. The fine particle size of tailings in oxidised conditions increases their reactivity, and these materials can begin to produce higher concentrations of metals/metalloids once the pH falls below 4.

- In tailings, dissolved trace metal/metalloid concentrations are initially below the laboratory LoR in water extracts (1:5 w:v). However, if allowed to oxidise, KLC test results (4:1 w:v), show concentrations of Al, As, Co, Cr, Cu, Mn, Ni, Pb, U, and Zn in pore water can be marginally above freshwater aquatic ecosystem values (95% protection level) or livestock drinking water criteria (ANZG 2018).
- Inorganic carbon (graphite) is insoluble and is unlikely to report in water extracts of the tailings materials. Dissolved organic carbon detected in tailings is likely to be from the addition of flotation reagent in the processing circuit, although concentrations are comparable to natural soil. An assessment of total petroleum hydrocarbons indicates an initial five to ten fold increase in the C15-C28 fraction, which can be managed by photodegradation in sunlight.
- The tailing samples behave as a sand. They are likely to be permeable, to drain quickly, and have low water retention characteristics. They are classified as Emerson Class 3 or 4 and are expected to have good structure and stability with limited shrink / swell behaviour, and to settle quickly.

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7 Attachments

Attachment A: Acid and Metalliferous Drainage

The use of consistent terminology is required so the potential for misunderstanding is reduced throughout the project.

Mined materials may include the following.

- Mine waste – mine waste includes overburden, tailings, rejects, low grade ore, process residue.
- Rehabilitation materials – material to be utilised for cover systems and water management drains that could include oxide (e.g. soil, or fully weathered non-consolidated units such as clay that can be free dug without blasting), transition (include oxide and fresh material) or fresh (competent un-weathered rock) geological units.
- Cover materials – material selectively placed within the upper profile of the rehabilitated landform in a cover system. Cover systems are constructed from rehabilitation materials. Cover systems should be designed and constructed to meet specific objectives and design criteria. Chemical and physical characterisation of rehabilitation materials is required to ensure that the cover system will meet the objectives and design criteria.

In Australia, the term Acid and Metalliferous Drainage (AMD) is defined as incorporating acidic metalliferous drainage, neutral metalliferous drainage, and saline drainage (COA, 2016).

Classifications of the net acid producing potential (NAPP) of mined materials are based on reactivity rates for pyrite (FeS_2) as the dominant source of sulfide sulfur. Geochemical reactions for pyrrhotite ($Fe_{(1-x)}S$) are discussed in **Section 1.5.2** of this report.

Standard industry terms include the following.

- AF (Acid Forming) – highly reactive material that can produce acid rapidly (days to weeks).
- PAF (Potentially Acid Forming) - has the potential to produce acid.
- PAF- LC (Potentially Acid Forming - Low Capacity) - has the potential to produce minor amounts of acid.
- NAF (Non-Acid Forming) - will not produce acid but may leach salts and some metals due to the presence of low sulfide bearing material.
- NAF-Barren (Non-Acid Forming-Barren) - will not produce acid or leach salts due to the absence of sulfide minerals (typically less than 0.1 to 0.2% total sulfur).
- AC (Acid Consuming) – has some acid neutralising capacity (ANC) that will contribute to ongoing acid neutralisation e.g. calcite in Basalt.

General industry terms that can be used to describe water quality at mines include the following.

- Acid Mine Drainage.
- Acid Rock Drainage.
- Acid and Metalliferous Drainage.
- Neutral Mine Drainage.
- Saline Drainage.
- Mine Impacted Water.

Water on mines includes surface water and groundwater. Groundwater can be considered as water that is present in non-mined ground that has the potential to enter pits (operational pits, backfilled pits or decommissioned pits). After groundwater enters a pit, it will become mine impacted water. Mine impacted water could leave a pit and enter the groundwater system in the receiving environment or become surface water that may then be pumped from the pit. Surface water is present in dams, creeks, and process plants. Seepage from landforms can drain to groundwater or it may appear as resurgent seepage to surface water.

The term mine impacted water is used as a general term to describe water which contacts disturbed ground and that may include water in:

- Seepage from waste rock dumps or low-grade ore stockpiles (in-pit or ex-pit);
- Operating pits;
- Decommissioned pits; and
- Back-filled pits.

Mine impacted water can be classified as having:

- Acid, neutral or alkaline pH;
- Variable concentrations of major ions (salts e.g. calcium, magnesium, potassium, sodium, chloride, sulfate, boron or fluoride); and
- Variable concentrations of metals (e.g. Al, Fe, Mn and Zn) or metalloids (e.g. Mo, Se and V) with the concentrations often linked to pH.

Potential sources of acid in mine impacted water at mine sites can include the following.

- Oxidation of sulfide minerals such as pyrite that produce sulfuric acid (INAP, 2009).
- Rainfall and leaching of cations such as calcium (Ca^{2+}), magnesium (Mg^{2+}), potassium (K^{+}) and sodium (Na^{+}) that reduce soil pH by atmospheric carbonic, nitric or sulfuric acid.
- Organic matter decay.

Potential sources of salts in mine impacted water at mine sites that can include the following.

- Oxidation of sulfide minerals, the production of sulfuric acid and subsequent neutralisation reactions that mobilise major ions such as sulfate (SO_4^{2-}) and calcium.
- Chemical weathering of adjacent soil and rock by sulfuric acid that releases major ions such as sodium, potassium, magnesium and chloride.
- The mobilisation of sodium chloride (NaCl) or sodium bi-carbonate ($NaHCO_3$) that are present within geological units and groundwater and then released in fluxes as mined materials are extracted (blasted), processed (crushed) and placed into mine landforms.

Potential sources of metals (e.g. Al, Fe, Mn, and Zn) and metalloids (oxyanions such as Mo, Se and V) in water at mine sites can include elements present:

- As ancillary minerals within primary sulfide minerals like pyrite or marcasite;
- In the solid phase of geological units in a range of minerals; and
- In pore water.

Pathways by which AMD is mobilised

AMD is mobilised by water and is transported from the source materials along aqueous physical pathways into the receiving environment. The salts, metals and metalloids in aqueous phases can be taken up by aqueous flora and fauna via aqueous biophysical pathways.

Salts, metals, and metalloids present as exchangeable or less soluble fractions (e.g., carbonate or oxide fractions) can also be relocated via physical pathways in the aqueous environment as suspended sediment or bedload sediment.

Salts, metals, and metalloids present in soluble or exchangeable fractions within mined material or process waste can also be taken up by plants via terrestrial biophysical pathways.

Wind borne erosion is another pathway whereby salts, metals and metalloids can be moved from the source to the receiving environment.

Attachment B: Geochemical characterisation tables

Table B1: Acid Base Account Results for mine materials and tailings from the Graphinex Project

Sample No.	Date	RGS Sample ID	Drill Hole ID	Client Sample ID	Sample Lithology	From	To	$pH_{(1:5)}$	$EC_{(1:5)}$	Total S*	S_{CR}[1]	ANC[1]*	MPA[1]	NAPP[1]	ANC: MPA Ratio	TC	NAG_{pH}	NAG Capacity (pH 4.5)	NAG Capacity (pH 7)	Sample Classification[2]
						(m)			(µS/cm)	(%)	(%)	(kg H_2SO_4/t)				(% C)		(kg H_2SO_4/t)		
1	30/09/2024	2023072__042	24ESD001	B480634	Alluvium	0.3	1.0	5.0	5	0.01		<0.5	0.3	0.1	0.8	0				Non-Acid Forming (Barren)
2	30/09/2024	2023072__067	24ESD002	B480661	Alluvium	0.3	1.0	6.3	12	<0.01		0.7	0.2	-0.5	4.6	0				Non-Acid Forming (Barren)
3	30/09/2024	2023072__099	24ESD004	B480694	Alluvium	5.4	6.0	8.8	109	<0.01		1.4	0.2	-1.2	9.1	0				Non-Acid Forming (Barren)
4	30/09/2024	2023072__043	24ESD001	B480635	Claystone	3.0	3.5	9.3	131	0.01		1.1	0.3	-0.8	3.6	0				Non-Acid Forming (Barren)
5	30/09/2024	2023072__044	24ESD001	B480636	Claystone	8.5	9.0	9.4	248	<0.01		3.5	0.2	-3.3	22.9	0				Non-Acid Forming (Barren)
6	30/09/2024	2023072__045	24ESD001	B480637	Claystone	14.0	14.5	9.4	356	0.01		2.2	0.3	-1.9	7.2	0				Non-Acid Forming (Barren)
7	30/09/2024	2023072__046	24ESD001	B480638	Claystone	19.5	20.0	9.2	342	0.01		2.7	0.3	-2.4	8.8	0				Non-Acid Forming (Barren)
8	30/09/2024	2023072__068	24ESD002	B480662	Claystone	4.0	4.5	9.5	161	0.02		3.2	0.6	-2.6	5.2	0				Non-Acid Forming (Barren)
9	30/09/2024	2023072__047	24ESD001	B480639	Claystone	25.0	25.5	9.2	267	<0.01		2.9	0.2	-2.7	18.9	0				Non-Acid Forming (Barren)
10	30/09/2024	2023072__069	24ESD002	B480663	Claystone	9.5	10.0	9.2	216	<0.01		2.6	0.2	-2.4	17.0	0				Non-Acid Forming (Barren)
11	30/09/2024	2023072__048	24ESD001	B480640	Claystone	30.5	31.0	9.0	149	<0.01		2.4	0.2	-2.2	15.7	0				Non-Acid Forming (Barren)
12	30/09/2024	2023072__070	24ESD002	B480664	Claystone	20.0	20.5	9.8	643	<0.01		7.7	0.2	-7.5	50.3	0				Non-Acid Forming (Barren)
13	30/09/2024	2023072__071	24ESD002	B480666	Claystone	41.0	41.5	9.0	50	<0.01		2.4	0.2	-2.2	15.7	<0.02				Non-Acid Forming (Barren)
14	30/09/2024	2023072__100	24ESD004	B480695	Claystone	8.0	8.5	9.1	472	<0.01		5.6	0.2	-5.4	36.6	<0.02				Non-Acid Forming (Barren)
15	30/09/2024	2023072__101	24ESD004	B480696	Claystone	13.5	14.0	9.8	966	<0.01		34.6	0.2	-34.4	226.0	0				Non-Acid Forming (Barren)
16	30/09/2024	2023072__102	24ESD004	B480697	Claystone	19.0	19.5	8.8	462	0.02		2.8	0.6	-2.2	4.6	0				Non-Acid Forming (Barren)
17	30/09/2024	2023072__103	24ESD004	B480698	Claystone	24.5	25.0	9.2	504	0.01		4.2	0.3	-3.9	13.7	0				Non-Acid Forming (Barren)
18	30/09/2024	2023072__104	24ESD004	B480699	Claystone	30.0	30.5	8.6	261	0.01		2.6	0.3	-2.3	8.5	0				Non-Acid Forming (Barren)
19	30/09/2024	2023072__110	24ESD004	B480705	Sandstone - Massive	62.9	63.1	7.2	220	0.10	0.106	10.5	3.2	-7.3	3.2	2				Non-Acid Forming
20	30/09/2024	2023072__049	24ESD001	B480641	Sandstone bedded	36.0	36.5	8.9	120	<0.01		2.8	0.2	-2.6	18.3	0				Non-Acid Forming (Barren)
21	30/09/2024	2023072__050	24ESD001	B480642	Sandstone bedded	41.5	42.0	9.1	68	0.02		2.3	0.6	-1.7	3.8	<0.02				Non-Acid Forming (Barren)
22	30/09/2024	2023072__051	24ESD001	B480643	Sandstone bedded	47.0	47.5	9.2	52	<0.01		2.4	0.2	-2.2	15.7	0				Non-Acid Forming (Barren)
23	30/09/2024	2023072__052	24ESD001	B480644	Standstone bedded	52.5	53.0	9.2	44	<0.01		2.8	0.2	-2.6	18.3	0				Non-Acid Forming (Barren)
24	30/09/2024	2023072__072	24ESD002	B480667	Sandstone bedded	48.0	48.5	9.0	44	<0.01		4.1	0.2	-3.9	26.8	0				Non-Acid Forming (Barren)
25	30/09/2024	2023072__105	24ESD004	B480700	Sandstone bedded	40.0	40.5	8.8	194	0.02		5.4	0.6	-4.8	8.8	0				Non-Acid Forming (Barren)
26	30/09/2024	2023072__106	24ESD004	B480701	Sandstone bedded	45.5	46.0	8.9	91	<0.01		4.1	0.2	-3.9	26.8	0				Non-Acid Forming (Barren)
27	30/09/2024	2023072__107	24ESD004	B480702	Sandstone bedded	51.0	51.5	9.1	102	<0.01		9.3	0.2	-9.1	60.7	0				Non-Acid Forming (Barren)
28	30/09/2024	2023072__108	24ESD004	B480703	Sandstone bedded	56.5	57.0	8.9	95	0.01		7.2	0.3	-6.9	23.5	1				Non-Acid Forming (Barren)
29	30/09/2024	2023072__073	24ESD002	B480668	Siltstone	52.0	52.5	9.3	382	0.05		18.2	1.5	-16.7	11.9	1				Non-Acid Forming (Barren)
30	30/09/2024	2023072__086	24ESMD001	B480681	Siltstone	57.0	57.5	9.1	393	0.07		14.3	2.1	-12.2	6.7	1				Non-Acid Forming (Barren)
31	30/09/2024	2023072__087	24ESMD001	B480682	Siltstone	60.0	60.5	8.4	76	0.02		9.9	0.6	-9.3	16.2	1				Non-Acid Forming (Barren)
32	30/09/2024	2023072__109	24ESD004	B480704	Siltstone	58.0	58.5	9.0	356	0.08		15.5	2.5	-13.1	6.3	1				Non-Acid Forming (Barren)
33	30/09/2024	2023072__090	24ESMD001	B480685	Dolerite	99.0	99.5	9.7	156	<0.01		28.4	0.2	-28.2	185.5	0				Non-Acid Forming (Barren)
34	30/09/2024	2023072__078	24ESMD002	B480673	Metasediments	124.0	124.5	9.6	236	0.02		36.6	0.6	-36.0	59.8	1				Non-Acid Forming (Barren)
35	30/09/2024	2023072__111	24ESD004	B480706	Metasediments	64.0	64.5	8.6	117	0.01		12.5	0.3	-12.2	40.8	1				Non-Acid Forming (Barren)
36	30/09/2024	2023072__112	24ESD004	B480707	Metasediments	69.5	70.0	9.1	95	<0.01		7.4	0.2	-7.2	48.3	0				Non-Acid Forming (Barren)
37	30/09/2024	2023072__113	24ESD004	B480708	Metasediments	82.0	82.5	9.3	161	<0.01		22.2	0.2	-22.0	145.0	0				Non-Acid Forming (Barren)
38	30/09/2024	2023072__054	24ESD001B	B480648	Granite	89.5	90.0	8.8	182	0.05		8.3	1.5	-6.8	5.4	2				Non-Acid Forming (Barren)
39	30/09/2024	2023072__079	24ESMD002	B480674	Granite	132.0	132.5	9.3	104	0.05		22.3	1.5	-20.8	14.6	3				Non-Acid Forming (Barren)
40	30/09/2024	2023072__088	24ESMD001	B480683	Granite	70.5	71.0	8.9	171	0.02		17.7	0.6	-17.1	28.9	0				Non-Acid Forming (Barren)
41	30/09/2024	2023072__089	24ESMD001	B480684	Granite	86.0	86.5	9.4	120	<0.01		15.6	0.2	-15.4	101.9	0				Non-Acid Forming (Barren)
42	30/09/2024	2023072__091	24ESMD001	B480686	Granite	101.5	102.0	9.6	134	<0.01		9.3	0.2	-9.1	60.7	0				Non-Acid Forming (Barren)
43	30/09/2024	2023072__095	24ESMD001	B480690	Granite	163.5	164.0	9.1	116	0.07		24.0	2.1	-21.9	11.2	1				Non-Acid Forming (Barren)
44	30/09/2024	2023072__063	24ESD001B	B480657	Granite	198.0	198.5	8.6	64	0.99	0.120	9.6	3.7	-5.9	2.6	2				Non-Acid Forming
45	30/09/2024	2023072__053	24ESD001B	B480647	Granite	74.0	74.5	6.4	577	1.05	1.010	2.4	30.9	28.5	0.1	3				Potentially Acid Forming
46	30/09/2024	2023072__074	24ESMD002	B480669	Granite	70.0	70.5	9.0	194	0.03		113.0	0.9	-112.1	123.0	8				Non-Acid Forming (Barren)
47	30/09/2024	2023072__075	24ESMD002	B480670	Granite	85.5	86.0	6.2	1,760	0.16	0.180	12.9	5.5	-7.4	2.3	2				Non-Acid Forming
48	30/09/2024	2023072__077	24ESMD002	B480672	Granite	116.5	117.0	9.0	139	0.07		19.5	2.1	-17.4	9.1	8				Non-Acid Forming (Barren)
49	30/09/2024	2023072__081	24ESMD002	B480676	Granite	163.0	163.5	9.0	83	0.27	0.277	10.0	8.5	-1.5	1.2	6				Uncertain
50	30/09/2024	2023072__114	24ESD004	B480709	Granite	92.0	92.5	9.2	233	<0.01		57.1	0.2	-56.9	372.9	4				Non-Acid Forming (Barren)
51	30/09/2024	2023072__115	24ESD004	B480710	Granite	102.5	103.0	9.4	258	<0.01		33.5	0.2	-33.3	218.8	20				Non-Acid Forming (Barren)
52	30/09/2024	2023072__055	24ESD001B	B480649	Metasediments	98.6	99.1	9.0	124	0.17	0.180	8.1	5.5	-2.6	1.5	11				Uncertain
53	30/09/2024	2023072__062	24ESD001B	B480656	Metasediments	184.3	184.8	9.2	112	0.11	0.114	16.5	3.5	-13.0	4.7	4				Non-Acid Forming

Table B1: Acid Base Account Results for mine materials and tailings from the Graphinex Project

Sample No.	Date	RGS Sample ID	Drill Hole ID	Client Sample ID	Sample Lithology	From (m)	To (m)	$pH_{(1:5)}$	$EC_{(1:5)}$ (µS/cm)	Total S* (%)	S_{CR}[1] (%)	ANC^{1}* (kg H_2SO_4/t)	MPA^{1} (kg H_2SO_4/t)	$NAPP^{1}$ (kg H_2SO_4/t)	ANC: MPA Ratio	TC (% C)	NAG_{pH}	NAG Capacity (pH 4.5) (kg H_2SO_4/t)	NAG Capacity (pH 7) (kg H_2SO_4/t)	Sample Classification[2]
54	30/09/2024	2023072__120	24ESD004	B480715	Granite	180.0	180.5	9.0	197	0.68	0.685	14.0	21.0	7.0	0.7	2				Potentially Acid Forming - Low Capacity
55	30/09/2024	2023072__092	24ESMD001	B480687	Granite	117.0	117.5	9.0	137	0.66	0.764	14.9	23.4	8.5	0.6	7				Potentially Acid Forming - Low Capacity
56	30/09/2024	2023072__080	24ESMD002	B480675	Granite	147.5	148.0	8.7	140	0.91	0.904	11.1	27.7	16.6	0.4	3				Potentially Acid Forming
57	30/09/2024	2023072__098	24ESMD001	B480693	Granite	210.0	210.5	8.9	167	0.90	0.908	12.5	27.8	15.3	0.4	4				Potentially Acid Forming
58	30/09/2024	2023072__093	24ESMD001	B480688	Granite	132.5	133.0	9.0	104	0.85	0.934	10.4	28.6	18.2	0.4	5				Potentially Acid Forming
59	30/09/2024	2023072__076	24ESMD002	B480671	Granite	101.0	101.5	7.2	376	1.41	1.200	7.9	36.8	28.9	0.2	7				Potentially Acid Forming
60	30/09/2024	2023072__057	24ESD001B	B480651	Granite	120.5	121.0	8.5	95	1.22	1.220	7.7	37.4	29.7	0.2	8				Potentially Acid Forming
61	30/09/2024	2023072__083	24ESMD002	B480678	Granite	194.0	194.5	7.5	171	1.35	1.323	13.1	40.5	27.4	0.3	5				Potentially Acid Forming
62	30/09/2024	2023072__121	24ESD004	B480716	Granite	195.5	196.0	8.4	104	1.28	1.340	8.9	41.0	32.1	0.2	4				Potentially Acid Forming
63	30/09/2024	2023072__056	24ESD001B	B480650	Granite	105.0	105.5	7.7	287	1.36	1.440	8.2	44.1	35.9	0.2	7				Potentially Acid Forming
64	30/09/2024	2023072__117	24ESD004	B480712	Granite	133.5	134.0	8.6	175	1.44	1.490	13.1	45.6	32.5	0.3	5				Potentially Acid Forming
65	30/09/2024	2023072__061	24ESD001B	B480655	Granite	182.5	183.0	8.9	140	1.46	1.540	11.6	47.2	35.6	0.2	5				Potentially Acid Forming
66	30/09/2024	2023072__097	24ESMD001	B480692	Granite	194.5	195.0	8.3	171	1.49	1.600	12.0	49.0	37.0	0.2	4				Potentially Acid Forming
67	30/09/2024	2023072__116	24ESD004	B480711	Granite	118.0	118.5	8.4	78	1.54	1.600	8.6	49.0	40.4	0.2	8				Potentially Acid Forming
68	30/09/2024	2023072__060	24ESD001B	B480654	Granite	167.0	167.5	8.5	83	1.69	1.620	8.0	49.6	41.6	0.2	7				Potentially Acid Forming
69	30/09/2024	2023072__096	24ESMD001	B480691	Granite	179.0	179.5	8.9	116	1.64	1.640	9.3	50.2	40.9	0.2	8				Potentially Acid Forming
70	30/09/2024	2023072__085	24ESMD002	B480680	Granite	225.0	225.5	7.5	129	1.71	1.720	9.4	52.7	43.3	0.2	6				Potentially Acid Forming
71	30/09/2024	2023072__082	24ESMD002	B480677	Granite	178.5	179.0	8.0	90	1.79	1.770	9.3	54.2	44.9	0.2	8				Potentially Acid Forming
72	30/09/2024	2023072__084	24ESMD002	B480679	Granite	209.5	210.0	7.4	92	1.78	1.800	8.7	55.1	46.4	0.2	7				Potentially Acid Forming
73	30/09/2024	2023072__066	24ESD001B	B480660	Granite	244.5	245.0	8.2	71	1.70	1.900	8.1	58.2	50.1	0.1	5				Potentially Acid Forming
74	30/09/2024	2023072__064	24ESD001B	B480658	Granite	213.5	214.0	8.3	68	2.00	1.910	9.2	58.5	49.3	0.2	7				Potentially Acid Forming
75	30/09/2024	2023072__119	24ESD004	B480714	Granite	164.5	165.0	8.3	95	1.74	1.940	8.7	59.4	50.7	0.1	7				Potentially Acid Forming
76	30/09/2024	2023072__118	24ESD004	B480713	Granite	149.0	149.5	8.0	107	2.00	1.990	10.4	60.9	50.5	0.2	8				Potentially Acid Forming
77	30/09/2024	2023072__059	24ESD001B	B480653	Granite	151.5	152.0	8.3	71	2.03	2.020	3.2	61.9	58.7	0.1	6				Potentially Acid Forming
78	30/09/2024	2023072__122	24ESD004	B480717	Granite	211.0	211.5	7.6	107	2.04	2.020	10.3	61.9	51.6	0.2	9				Potentially Acid Forming
79	30/09/2024	2023072__058	24ESD001B	B480652	Granite	136.0	136.5	8.3	92	2.12	2.120	2.4	64.9	62.5	0.0	12				Potentially Acid Forming
80	30/09/2024	2023072__094	24ESMD001	B480689	Granite	148.0	148.5	8.2	90	2.44	2.820	7.8	86.4	78.6	0.1	11				Potentially Acid Forming
81	30/09/2024	2023072__065	24ESD001B	B480659	Granite	229.0	229.5	7.4	103	3.53	3.520	11.3	107.8	96.5	0.1	3				Potentially Acid Forming
82	17/10/2024	2023072_C101	Tailings	P80 0.3mm Sighter Float #14				8.7	112	1.42	1.420	6.7	43.5	36.8	0.2	1	2.7	31.8	43.2	Potentially Acid Forming
83	17/10/2024	2023072_C102	Tailings	P80 0.3mm Sighter Float #15				8.5	135	1.51	1.490	6.9	45.6	38.7	0.2	2	2.7	35.7	43.0	Potentially Acid Forming
84	17/10/2024	2023072_C103	Tailings	P80 0.3mm Sighter Float #16				8.6	146	1.50	1.500	6.4	45.9	39.5	0.1	2	2.7	32.7	39.9	Potentially Acid Forming
85	17/10/2024	2023072_C104	Tailings	P80 0.3mm Sighter Float #17				8.4	160	1.47	1.460	5.7	44.7	39.0	0.1	1	2.7	29.4	39.8	Potentially Acid Forming
86	17/10/2024	2023072_C105	Tailings	P80 0.3mm Sighter Float #18				8.7	135	1.48	1.480	5.4	45.3	39.9	0.1	2	2.6	32.4	42.7	Potentially Acid Forming
87	9/04/2025	2024066_001	Tailings	Tailings Solids - Tank 1				8.2	392	1.96	1.800	13.1	55.1	42.0	0.2	1	2.3	29.3	38.6	Potentially Acid Forming
88	9/04/2025	2024066_002	Tailings	Tailings Solids - Tank 2				8.3	341	1.89	0.608	16.7	18.6	1.9	0.9	1	2.5	29.3	38.5	Uncertain
89	9/04/2025	2024066_003	Tailings	Tailings Solids - Tank 3				8.2	390	1.91	1.800	14.6	55.1	40.5	0.3	1	2.4	29.4	37.0	Potentially Acid Forming
90	05/12/2024	2023072_C01	Composite	Soil				7.1	63					-2.0			5.5	<0.1	26.3	Non-Acid Forming
91	05/12/2024	2023072_C02	Composite	Overburden - Claystone				9.2	451					-5.5			6.5	<0.1	5.2	Non-Acid Forming
92	05/12/2024	2023072_C03	Composite	Overburden - Sandstone				7.7	110					-7.2			7.1	<0.1	<0.1	Non-Acid Forming
93	05/12/2024	2023072_C04	Composite	Overburden - Siltstone				8.1	270					-22.4			6.3	<0.1	3.0	Non-Acid Forming
94	05/12/2024	2023072_C05	Composite	Waste Rock - Dolerite + Metased				9.1	176					-14.8			8.1	<0.1	<0.1	Non-Acid Forming
95	05/12/2024	2023072_C06	Composite	Low Grade Ore - NAF-B				8.6	128					-22.7			7.2	<0.1	<0.1	Non-Acid Forming
96	05/12/2024	2023072_C07	Composite	Low Grade Ore - PAF				7.2	417					-12.4			2.8	21.1	30.9	Uncertain
97	05/12/2024	2023072_C08	Composite	Ore Body - NAF-B/ NAF/ Uncertain				8.3	198					-9.4			3.9	2.2	5.4	Uncertain
98	05/12/2024	2023072_C09	Composite	Ore Body - PAF-LC/ Low Sulfur				7.6	416					30.3			2.9	21.1	29.0	Potentially Acid Forming
99	05/12/2024	2023072_C10	Composite	Ore Body - PAF/ Moderate Sulfur				7.6	154					49.2			2.6	39.3	48.4	Potentially Acid Forming
100	05/12/2024	2023072_C11	Composite	Ore Body - PAF/ High Sulfur				6.8	128					58.0			2.6	38.6	45.3	Potentially Acid Forming

Notes:

2. Sample classification criteria detail provided in report text.

* Where total sulfur or ANC results are less than the laboratory LoR a value of half of the LoR is used .

Table B2: Multi-Element Results for mine materials and tailings from the Graphinex Project

	RGS Sample Number →		2023072_C01	2023072_C02	2023072_C03	2023072_C04	2023072_C05	2023072_C06	2023072_C07
	Sampling Date →		07/11/2024	07/11/2024	07/11/2024	07/11/2024	07/11/2024	07/11/2024	07/11/2024
	ALS Laboratory ID →		EB2438700001	EB2438700002	EB2438700003	EB2438700004	EB2438700005	EB2438700006	EB2438700007
Parameters	**Limit of Reporting**	NEPC[1] Health-Based Investigation Level (HILs)-C	Soil	Overburden: Claystone	Overburden: Sandstone	Overburden: Siltstone	Waste Rock: Dolerite + Metasediments	Low Grade Ore: NAF - B	Low Grade Ore: PAF
Major Cations	All units mg/kg		All units mg/kg						
Calcium (Ca)	50	-	900	1,000	1,200	2,200	5,600	7,100	2,500
Magnesium (Mg)	50	-	600	1,900	2,300	3,900	5,400	4,400	2,800
Potassium (K)	50	-	200	1,800	2,100	2,800	4,400	2,100	1,500
Sodium (Na)	50	-	200	1,900	1,100	1,400	400	300	300
Aluminium (Al)	50	-	3,100	11,900	10,100	20,900	20,000	19,200	13,600
Iron (Fe)	50	-	9,300	17,000	18,200	37,800	42,900	43,300	43,200
Minor and Trace Elements	All units mg/kg		All units in mg/kg						
Antimony (Sb)	0.05	-	0.14	0.18	0.11	0.17	0.19	0.67	0.59
Arsenic (As)	0.1	300	2.0	4.1	6.1	5.9	1.6	16.4	31.9
Barium (Ba)	10	-	30	150	140	60	60	30	30
Beryllium (Be)	0.05	90	0.15	0.78	0.78	2.06	1.87	1.36	0.59
Bismuth (Bi)	0.01	-	0.04	0.11	0.09	0.34	0.17	0.17	0.16
Boron (B)	10	20,000	<10	<10	<10	<10	<10	<10	<10
Cadmium (Cd)	0.01	90	<0.01	<0.01	0.03	0.18	0.06	0.45	0.79
Caesium (Cs)	0.05	-	0.39	2.01	2.32	5.37	6.83	6.36	1.29
Cerium (Ce)	0.02	-	13.8	26.5	28.3	75.9	92.6	105.0	87.4
Chromium (Cr)	1	300	17	21	22	16	21	15	15
Cobalt (Co)	0.1	300	1.7	34.9	13.6	20.3	12.9	14.7	27.6
Copper (Cu)	0.2	17,000	4.2	25.2	11.3	29.8	39.9	39.3	140.5
Gallium (Ga)	0.05	-	1.36	4.42	4.08	10.05	9.34	11.25	7.37
Germanium (Ge)	0.05	-	<0.05	0.07	0.10	0.14	0.13	0.17	0.15
Gold (Au)	0.02	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Hafnium (Hf)	0.02	-	0.05	0.23	0.17	0.25	0.17	0.29	0.15
Indium (In)	0.005	-	0.009	0.025	0.024	0.092	0.044	0.061	0.058
Lanthanum (La)	0.2	-	6.0	9.9	12.0	28.9	46.7	50.9	39.6
Lead (Pb)	0.2	600	3.3	8.2	7.1	26.9	30.4	48.3	43.0
Lithium (Li)	0.1	-	1.4	9.1	11.5	35.2	28.2	25.7	21.5
Manganese (Mn)	5	19,000	65	192	986	1,210	800	626	483
Mercury (Hg)	0.01	80	<0.01	<0.01	0.01	0.02	<0.01	<0.01	0.01
Molybdenum (Mo)	0.05	-	0.7	0.6	1.2	1.3	3.7	4.1	12.9
Nickel (Ni)	0.2	1,200	5.5	11.8	18.2	18.3	23.2	22.4	45.2
Niobium (Nb)	0.05	-	0.07	<0.05	0.06	<0.05	<0.05	0.11	0.25
Phosphorus (P)	10	-	30	60	160	340	590	620	500
Rhenium (Re)	0.001	-	<0.001	<0.001	<0.001	0.007	0.001	0.002	0.004
Rubidium (Rb)	0.1	-	3.9	19.8	18.1	27.6	51.8	24.6	14.5
Scandium (Sc)	0.1	-	0.8	3.3	3.2	9.8	5.5	7.1	6.6
Selenium (Se)	0.2	700	<0.2	<0.2	0.3	0.3	<0.2	0.2	0.8
Silver (Ag)	0.01	-	0.03	0.06	0.04	0.13	0.08	0.19	0.20
Strontium (Sr)	0.2	-	5.8	23.6	35.4	40.0	19.2	13.5	6.8
Sulfur (S)	0.01	-	100	100	200	600	200	400	1,200
Tantalum (Ta)	0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Tellurium (Te)	0.01	-	0.01	0.01	0.01	0.06	0.03	0.08	0.19
Thallium (Tl)	0.02	-	0.03	0.14	0.20	0.26	0.56	0.24	0.18
Thorium (Th)	0.2	-	2.3	4.7	4.5	11.5	16.2	19.2	17.9
Tin (Sn)	0.2	-	0.3	4.5	1.4	1.8	1.4	2.9	1.5
Titanium (Ti)	0.005	-	60	90	110	80	130	420	320
Tungsten (W)	0.05	-	0.35	0.64	0.86	<0.05	0.13	0.22	0.37
Uranium (U)	0.05	-	0.33	0.61	0.47	1.30	1.93	3.26	4.27
Vanadium (V)	1	-	15	40	27	51	29	24	19
Yttrium (Y)	0.05	-	2.6	7.5	7.4	27.8	22.9	34.6	29.4
Zinc (Zn)	2	30,000	43	25	40	142	129	194	141
Zirconium (Zr)	0.5	-	2.0	8.6	5.4	6.5	5.6	9.2	4.4

Notes: < indicates less than the laboratory limit of reporting. Shaded cells exceed applied guideline limit. ** Guideline level for Cr(VI) = 300 mg/kg.

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

Table B2: Multi-Element Results for mine materials and tailings from the Graphinex Project

	RGS Sample Number →		2023072_C08	2023072_C09	2023072_C10	2023072_C11	2023072_C101	2023072_C102
	Sampling Date →		07/11/2024	07/11/2024	07/11/2024	07/11/2024	17/10/2024	17/10/2024
	ALS Laboratory ID →		EB2438700008	EB2438700009	EB2438700010	EB2438700011	EB2435821001	EB2435821002
Parameters	**Limit of Reporting**	NEPC[1] Health-Based Investigation Level (HILs)- C	Ore Body: NAF - B/ NAF/ Unc	Ore Body: PAF - LC/ Low S	Ore Body: PAF/ Mod S	Ore Body: PAF/ High S	Master Comp P80 0.3mm Sighter Float #14 (Batch 1)	Master Comp P80 0.3mm Sighter Float #15 (Batch 1)
Major Cations	All units mg/kg		All units mg/kg					
Calcium (Ca)	50	-	9,700	4,300	3,500	3,300	3,600	3,800
Magnesium (Mg)	50	-	6,400	3,200	2,300	2,800	2,300	2,500
Potassium (K)	50	-	2,200	1,900	1,800	1,400	1,400	1,400
Sodium (Na)	50	-	400	300	300	300	300	300
Aluminium (Al)	50	-	23,000	14,900	13,000	12,500	11,300	12,500
Iron (Fe)	50	-	58,000	47,600	56,600	67,800	48,700	52,500
Minor and Trace Elements	All units mg/kg		All units mg/kg					
Antimony (Sb)	0.05	-	0.62	1.29	1.06	1.18	0.92	0.88
Arsenic (As)	0.1	300	26.2	39.2	40.8	43.3	28.1	28.7
Barium (Ba)	10	-	40	30	30	20	20	20
Beryllium (Be)	0.05	90	1.53	0.93	0.90	0.69	0.86	0.92
Bismuth (Bi)	0.01	-	0.24	0.37	0.25	0.26	0.26	0.23
Boron (B)	10	20,000	<10	<10	<10	<10	<10	<10
Cadmium (Cd)	0.01	90	0.97	0.30	0.36	0.33	0.46	0.44
Caesium (Cs)	0.05	-	4.62	2.36	2.32	1.68	2.55	2.69
Cerium (Ce)	0.02	-	89.7	75.5	65.0	59.2	65.5	63.0
Chromium (Cr)	1	300	28	17	15	13	236	228
Cobalt (Co)	0.1	300	22.4	24.6	26.8	38.6	26.9	27.3
Copper (Cu)	0.2	17,000	119.0	194.5	206.0	267.0	147.0	176.0
Gallium (Ga)	0.05	-	14.05	8.44	6.80	6.53	6.24	6.78
Germanium (Ge)	0.05	-	0.14	0.15	0.16	0.17	0.19	0.18
Gold (Au)	0.02	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Hafnium (Hf)	0.02	-	0.15	0.20	0.22	0.20	0.21	0.21
Indium (In)	0.005	-	0.084	0.057	0.051	0.051	0.055	0.056
Lanthanum (La)	0.2	-	44.0	35.6	30.4	27.9	30.3	29.9
Lead (Pb)	0.2	600	40.0	38.9	37.2	35.2	38.1	38.2
Lithium (Li)	0.1	-	48.5	29.0	27.5	23.5	23.5	26.4
Manganese (Mn)	5	19,000	760	538	472	464	496	510
Mercury (Hg)	0.01	80	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum (Mo)	0.05	-	11.7	16.4	22.5	23.7	31.4	34.5
Nickel (Ni)	0.2	1,200	56.7	51.3	56.8	71.5	183.5	184.0
Niobium (Nb)	0.05	-	0.05	0.48	0.93	1.01	0.84	0.75
Phosphorus (P)	10	-	930	640	560	540	540	560
Rhenium (Re)	0.001	-	0.007	0.006	0.006	0.006	0.007	0.006
Rubidium (Rb)	0.1	-	25.3	19.3	19.7	15.0	15.9	16.2
Scandium (Sc)	0.1	-	8.5	7.6	7.5	7.8	5.6	5.9
Selenium (Se)	0.2	700	0.4	1.0	1.4	1.7	1.1	1.2
Silver (Ag)	0.01	-	0.36	0.27	0.23	0.28	0.21	0.23
Strontium (Sr)	0.2	-	14.7	6.4	6.1	4.4	5.7	5.9
Sulfur (S)	0.01	-	1,200	11,600	18,600	25,200	15,400	15,700
Tantalum (Ta)	0.01	-	<0.01	0.01	0.02	0.02	0.02	0.02
Tellurium (Te)	0.01	-	0.20	0.30	0.36	0.37	0.24	0.26
Thallium (Tl)	0.02	-	0.26	0.41	0.22	0.27	0.26	0.28
Thorium (Th)	0.2	-	16.6	17.3	16.1	14.9	15.5	15.4
Tin (Sn)	0.2	-	4.5	2.0	1.7	1.7	1.8	1.9
Titanium (Ti)	0.005	-	220	680	730	930	520	550
Tungsten (W)	0.05	-	0.23	0.77	0.94	1.01	1.62	1.62
Uranium (U)	0.05	-	5.03	6.26	6.28	5.43	4.72	4.87
Vanadium (V)	1	-	51	24	18	20	19	21
Yttrium (Y)	0.05	-	49.4	33.3	30.7	27.8	28.6	28.6
Zinc (Zn)	2	30,000	262	134	157	141	166	175
Zirconium (Zr)	0.5	-	4.4	5.4	6.1	5.0	5.2	5.3

Notes: < indicates less than the laboratory limit of reporting. Shaded cells exceed applied guideline limit. ** Guideline level for Cr(VI) = 300 mg/kg.

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

Table B2: Multi-Element Results for mine materials and tailings from the Graphinex Project

		RGS Sample Number →	2023072_C103	2023072_C104	2023072_C105	2024066_001	2024066_002	2024066_003
		Sampling Date →	17/10/2024	17/10/2024	17/10/2024	10/04/2025	10/04/2025	10/04/2025
		ALS Laboratory ID →	EB2435821003	EB2435821004	EB2435821005	EB2512414001	EB2512414002	EB2512414003
Parameters	**Limit of Reporting**	NEPC[1] Health-Based Investigation Level (HILs)- C	Master Comp P80 0.3mm Sighter Float #16 (Batch 1)	Master Comp P80 0.3mm Sighter Float #17 (Batch 1)	Master Comp P80 0.3mm Sighter Float #18 (Batch 1)	Tailings Solid - Tank 1 (Batch 2)	Tailings Solid - Tank 2 (Batch 2)	Tailings Solid - Tank 3 (Batch 2)
Major Cations	All units mg/kg		All units mg/kg					
Calcium (Ca)	50	-	3,700	3,700	3,800	4,900	4,900	4,800
Magnesium (Mg)	50	-	2,500	2,500	2,600	2,600	2,500	2,500
Potassium (K)	50	-	1,300	1,400	1,300	2,000	1,800	2,100
Sodium (Na)	50	-	300	300	300	300	300	300
Aluminium (Al)	50	-	12,200	12,400	12,600	13,100	12,800	13,200
Iron (Fe)	50	-	50,500	50,400	52,500	58,600	58,200	58,700
Minor and Trace Elements	All units mg/kg		All units mg/kg					
Antimony (Sb)	0.05	-	0.85	0.88	0.89	1.08	1.00	1.02
Arsenic (As)	0.1	300	27.4	26.4	27.1	24.8	23.8	22.6
Barium (Ba)	10	-	20	30	20	60	60	60
Beryllium (Be)	0.05	90	0.91	0.92	0.92	0.88	0.86	0.88
Bismuth (Bi)	0.01	-	0.24	0.23	0.23	0.22	0.21	0.21
Boron (B)	10	20,000	<10	<10	<10	<10	<10	<10
Cadmium (Cd)	0.01	90	0.45	0.44	0.44	0.38	0.41	0.39
Caesium (Cs)	0.05	-	2.69	2.72	2.74	2.28	2.21	2.25
Cerium (Ce)	0.02	-	65.7	63.7	64.0	60.8	57.8	57.9
Chromium (Cr)	1	300	221	174	187	24	24	27
Cobalt (Co)	0.1	300	26.8	26.7	26.9	31.4	30.0	30.4
Copper (Cu)	0.2	17,000	169.5	159.0	173.5	137.5	136.5	125.0
Gallium (Ga)	0.05	-	6.71	6.76	6.91	6.71	6.39	6.55
Germanium (Ge)	0.05	-	0.18	0.18	0.19	0.16	0.17	0.14
Gold (Au)	0.02	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Hafnium (Hf)	0.02	-	0.22	0.22	0.21	0.21	0.22	0.23
Indium (In)	0.005	-	0.058	0.057	0.056	0.054	0.052	0.051
Lanthanum (La)	0.2	-	31.1	30.0	30.6	28	27	28
Lead (Pb)	0.2	600	36.6	38.2	37.3	32.6	32.0	32.3
Lithium (Li)	0.1	-	26.1	25.9	26.8	22.9	22.6	22.7
Manganese (Mn)	5	19,000	475	466	484	494	491	485
Mercury (Hg)	0.01	80	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum (Mo)	0.05	-	34.5	24.4	31.4	2.5	2.3	2.3
Nickel (Ni)	0.2	1,200	178.5	149.5	159.5	68.2	67.4	68.1
Niobium (Nb)	0.05	-	0.76	0.79	0.80	0.71	0.74	0.69
Phosphorus (P)	10	-	560	550	550	570	570	560
Rhenium (Re)	0.001	-	0.008	0.005	0.006	0.001	0.002	0.001
Rubidium (Rb)	0.1	-	15.9	17.0	16.0	20.7	18.7	21.0
Scandium (Sc)	0.1	-	6.0	5.9	6.0	6.6	6.2	6.4
Selenium (Se)	0.2	700	1.1	1.2	1.2	1.3	1.2	1.3
Silver (Ag)	0.01	-	0.22	0.22	0.23	0.27	0.25	0.26
Strontium (Sr)	0.2	-	5.9	5.9	5.9	12.0	11.1	11.4
Sulfur (S)	0.01	-	15,300	15,400	16,000	18,600	19,000	19,200
Tantalum (Ta)	0.01	-	0.02	0.02	0.02	0.01	0.02	0.02
Tellurium (Te)	0.01	-	0.24	0.22	0.26	0.19	0.19	0.19
Thallium (Tl)	0.02	-	0.26	0.26	0.27	0.35	0.32	0.35
Thorium (Th)	0.2	-	15.7	15.6	15.4	12.6	12.8	12.8
Tin (Sn)	0.2	-	1.9	1.8	1.9	2.0	1.9	1.9
Titanium (Ti)	0.005	-	540	550	580	590	600	600
Tungsten (W)	0.05	-	1.67	1.33	1.46	0.60	0.59	0.58
Uranium (U)	0.05	-	4.86	4.76	4.83	4.00	4.08	4.00
Vanadium (V)	1	-	21	20	21	21	21	21
Yttrium (Y)	0.05	-	29.3	28.8	29.0	27.6	26.8	27.2
Zinc (Zn)	2	30,000	170	170	173	157	161	155
Zirconium (Zr)	0.5	-	5.3	5.3	5.4	6.1	5.7	6.0

Notes: < indicates less than the laboratory limit of reporting. Shaded cells exceed applied guideline limit. ** Guideline level for Cr(VI) = 300 mg/kg.

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

Table B3: Geochemical Abundance Index (GAI) Results for mine materials and tailings from the Graphinex Project

	RGS Sample Number →		2023072_C01	2023072_C02	2023072_C03	2023072_C04	2023072_C05	2023072_C06	2023072_C07
	Sampling Date →		07/11/2024	07/11/2024	07/11/2024	07/11/2024	07/11/2024	07/11/2024	07/11/2024
	ALS Laboratory ID →		EB2438700001	EB2438700002	EB2438700003	EB2438700004	EB2438700005	EB2438700006	EB2438700007
Parameters	**Limit of Reporting**	Median Crustal Abundance[1,2,3]	Soil	Overburden: Claystone	Overburden: Sandstone	Overburden: Siltstone	Waste Rock: Dolerite + Metasediments	Low Grade Ore: NAF - B	Low Grade Ore: PAF
Major Cations	(All units in mg/kg)		Geochemical Abundance Index						
Calcium (Ca)	50	15,000	0	0	0	0	0	0	0
Magnesium (Mg)	50	5,000	0	0	0	0	0	0	0
Potassium (K)	50	14,000	0	0	0	0	0	0	0
Sodium (Na)	50	5,000	0	0	0	0	0	0	0
Aluminium (Al)	50	71,000	0	0	0	0	0	0	0
Iron (Fe)	50	40,000	0	0	0	0	0	0	0
Minor and Trace Elements	(All units in mg/kg)		Geochemical Abundance Index						
Antimony (Sb)	0.05	1	0	0	0	0	0	0	0
Arsenic (As)	0.1	6	0	0	0	0	0	1	2
Barium (Ba)	10	500	0	0	0	0	0	0	0
Beryllium (Be)	0.05	0.3	0	1	1	2	2	2	0
Bismuth (Bi)	0.01	0.2	0	0	0	0	0	0	0
Boron (B)	10	20	0	0	0	0	0	0	0
Cadmium (Cd)	0.01	0.35	0	0	0	0	0	0	1
Caesium (Cs)	0.05	4	0	0	0	0	0	0	0
Cerium (Ce)	0.02	50	0	0	0	0	0	0	0
Chromium (Cr)	1	70	0	0	0	0	0	0	0
Cobalt (Co)	0.1	8	0	2	0	1	0	0	1
Copper (Cu)	0.2	30	0	0	0	0	0	0	2
Gallium (Ga)	0.05	20	0	0	0	0	0	0	0
Germanium (Ge)	0.05	1	0	0	0	0	0	0	0
Hafnium (Hf)	0.02	6	0	0	0	0	0	0	0
Indium (In)	0.005	1	0	0	0	0	0	0	0
Lanthanum (La)	0.2	40	0	0	0	0	0	0	0
Lead (Pb)	0.2	35	0	0	0	0	0	0	0
Lithium (Li)	0.1	25	0	0	0	0	0	0	0
Manganese (Mn)	5	1000	0	0	0	0	0	0	0
Mercury (Hg)	0.01	0.06	0	0	0	0	0	0	0
Molybdenum (Mo)	0.05	1.2	0	0	0	0	1	1	3
Nickel (Ni)	0.2	50	0	0	0	0	0	0	0
Niobium (Nb)	0.05	10	0	0	0	0	0	0	0
Phosphorus (P)	10	800	0	0	0	0	0	0	0
Rhenium (Re)	0.001	0.0007	0	0	0	3	0	1	2
Rubidium (Rb)	0.1	150	0	0	0	0	0	0	0
Scandium (Sc)	0.1	7	0	0	0	0	0	0	0
Selenium (Se)	0.2	0.4	0	0	0	0	0	0	0
Silver (Ag)	0.01	0.05	0	0	0	1	0	1	1
Strontium (Sr)	0.2	250	0	0	0	0	0	0	0
Sulfur (S)	0.01	700	0	0	0	0	0	0	0
Tantalum (Ta)	0.01	2	0	0	0	0	0	0	0
Tellurium (Te)	0.01	0.001	3	3	3	5	4	6	6
Thallium (Tl)	0.02	0.2	0	0	0	0	1	0	0
Thorium (Th)	0.2	9	0	0	0	0	0	1	0
Tin (Sn)	0.2	4	0	0	0	0	0	0	0
Titanium (Ti)	0.005	5000	0	0	0	0	0	0	0
Tungsten (W)	0.05	1.5	0	0	0	0	0	0	0
Uranium (U)	0.05	2	0	0	0	0	0	0	1
Vanadium (V)	1	90	0	0	0	0	0	0	0
Yttrium (Y)	0.05	40	0	0	0	0	0	0	0
Zinc (Zn)	2	90	0	0	0	0	0	1	0
Zirconium (Zr)	0.5	400	0	0	0	0	0	0	0

Notes: GAI's greater than or equal to 3 are highlighted. Apparent gold enrichment is an artifact of the laboratory Limit of Reporting (LoR)

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

2. When no GARD Guide value is available for particular element, then values are taken from Bowen (1979) Environmental Chemistry of the Elements, p 60-61.

3. If no guide value from GARD or Bowen H.J.M. (1979) exists, up to date, curated data is provided by CRC Handbook of Chemistry and Physics (2000).

Table B3: Geochemical Abundance Index (GAI) Results for mine materials and tailings from the Graphinex Project

	RGS Sample Number →		2023072_C08	2023072_C09	2023072_C10	2023072_C11	2023072_C101	2023072_C102
	Sampling Date →		07/11/2024	07/11/2024	07/11/2024	07/11/2024	17/10/2024	17/10/2024
	ALS Laboratory ID →		EB2438700008	EB2438700009	EB2438700010	EB2438700011	EB2435821001	EB2435821002
Parameters	**Limit of Reporting**	Median Crustal Abundance[1,2,3]	Ore Body: NAF - B/ NAF/ Unc	Ore Body: PAF - LC/ Low S	Ore Body: PAF/ Mod S	Ore Body: PAF/ High S	Master Comp P80 0.3mm Sighter Float #14	Master Comp P80 0.3mm Sighter Float #15
Major Cations	(All units in mg/kg)		Geochemical Abundance Index					
Calcium (Ca)	50	15,000	0	0	0	0	0	0
Magnesium (Mg)	50	5,000	0	0	0	0	0	0
Potassium (K)	50	14,000	0	0	0	0	0	0
Sodium (Na)	50	5,000	0	0	0	0	0	0
Aluminium (Al)	50	71,000	0	0	0	0	0	0
Iron (Fe)	50	40,000	0	0	0	0	0	0
Minor and Trace Elements	(All units in mg/kg)		Geochemical Abundance Index					
Antimony (Sb)	0.05	1	0	0	0	0	0	0
Arsenic (As)	0.1	6	2	2	2	2	2	2
Barium (Ba)	10	500	0	0	0	0	0	0
Beryllium (Be)	0.05	0.3	2	1	1	1	1	1
Bismuth (Bi)	0.01	0.2	0	0	0	0	0	0
Boron (B)	10	20	0	0	0	0	0	0
Cadmium (Cd)	0.01	0.35	1	0	0	0	0	0
Caesium (Cs)	0.05	4	0	0	0	0	0	0
Cerium (Ce)	0.02	50	0	0	0	0	0	0
Chromium (Cr)	1	70	0	0	0	0	1	1
Cobalt (Co)	0.1	8	1	1	1	2	1	1
Copper (Cu)	0.2	30	1	2	2	3	2	2
Gallium (Ga)	0.05	20	0	0	0	0	0	0
Germanium (Ge)	0.05	1	0	0	0	0	0	0
Hafnium (Hf)	0.02	6	0	0	0	0	0	0
Indium (In)	0.005	1	0	0	0	0	0	0
Lanthanum (La)	0.2	40	0	0	0	0	0	0
Lead (Pb)	0.2	35	0	0	0	0	0	0
Lithium (Li)	0.1	25	0	0	0	0	0	0
Manganese (Mn)	5	1000	0	0	0	0	0	0
Mercury (Hg)	0.01	0.06	0	0	0	0	0	0
Molybdenum (Mo)	0.05	1.2	3	3	4	4	4	4
Nickel (Ni)	0.2	50	0	0	0	0	1	1
Niobium (Nb)	0.05	10	0	0	0	0	0	0
Phosphorus (P)	10	800	0	0	0	0	0	0
Rhenium (Re)	0.001	0.0007	3	3	3	3	3	3
Rubidium (Rb)	0.1	150	0	0	0	0	0	0
Scandium (Sc)	0.1	7	0	0	0	0	0	0
Selenium (Se)	0.2	0.4	0	1	1	2	1	1
Silver (Ag)	0.01	0.05	2	2	2	2	1	2
Strontium (Sr)	0.2	250	0	0	0	0	0	0
Sulfur (S)	0.01	700	0	3	4	5	4	4
Tantalum (Ta)	0.01	2	0	0	0	0	0	0
Tellurium (Te)	0.01	0.001	6	6	6	6	6	6
Thallium (Tl)	0.02	0.2	0	0	0	0	0	0
Thorium (Th)	0.2	9	0	0	0	0	0	0
Tin (Sn)	0.2	4	0	0	0	0	0	0
Titanium (Ti)	0.005	5000	0	0	0	0	0	0
Tungsten (W)	0.05	1.5	0	0	0	0	0	0
Uranium (U)	0.05	2	1	1	1	1	1	1
Vanadium (V)	1	90	0	0	0	0	0	0
Yttrium (Y)	0.05	40	0	0	0	0	0	0
Zinc (Zn)	2	90	1	0	0	0	0	0
Zirconium (Zr)	0.5	400	0	0	0	0	0	0

Notes: GAI's greater than or equal to 3 are highlighted. Apparent gold enrichment is an artifact of the laboratory Limit of Reporting (LoR)

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

2. When no GARD Guide value is available for particular element, then values are taken from Bowen (1979) Environmental Chemistry of the Elements, p 60-61.

3. If no guide value from GARD or Bowen H.J.M. (1979) exists, up to date, curated data is provided by CRC Handbook of Chemistry and Physics (2000).

Table B3: Geochemical Abundance Index (GAI) Results for mine materials and tailings from the Graphinex Project

	RGS Sample Number →		2023072_C103	2023072_C104	2023072_C105	2024066_001	2024066_002	2024066_003
	Sampling Date →		17/10/2024	17/10/2024	17/10/2024	10/04/2025	10/04/2025	10/04/2025
	ALS Laboratory ID →		EB2435821003	EB2435821004	EB2435821005	EB2512414001	EB2512414002	EB2512414003
Parameters	**Limit of Reporting**	Median Crustal Abundance[1,2,3]	Master Comp P80 0.3mm Sighter Float #16	Master Comp P80 0.3mm Sighter Float #17	Master Comp P80 0.3mm Sighter Float #18	Tailings Solid - Tank 1 (Batch 2)	Tailings Solid - Tank 2 (Batch 2)	Tailings Solid - Tank 3 (Batch 2)
Major Cations	(All units in mg/kg)		Geochemical Abundance Index					
Calcium (Ca)	50	15,000	0	0	0	0	0	0
Magnesium (Mg)	50	5,000	0	0	0	0	0	0
Potassium (K)	50	14,000	0	0	0	0	0	0
Sodium (Na)	50	5,000	0	0	0	0	0	0
Aluminium (Al)	50	71,000	0	0	0	0	0	0
Iron (Fe)	50	40,000	0	0	0	0	0	0
Minor and Trace Elements	(All units in mg/kg)		Geochemical Abundance Index					
Antimony (Sb)	0.05	1	0	0	0	0	0	0
Arsenic (As)	0.1	6	2	2	2	1	1	1
Barium (Ba)	10	500	0	0	0	0	0	0
Beryllium (Be)	0.05	0.3	1	1	1	1	1	1
Bismuth (Bi)	0.01	0.2	0	0	0	0	0	0
Boron (B)	10	20	0	0	0	0	0	0
Cadmium (Cd)	0.01	0.35	0	0	0	0	0	0
Caesium (Cs)	0.05	4	0	0	0	0	0	0
Cerium (Ce)	0.02	50	0	0	0	0	0	0
Chromium (Cr)	1	70	1	1	1	0	0	0
Cobalt (Co)	0.1	8	1	1	1	1	1	1
Copper (Cu)	0.2	30	2	2	2	2	2	1
Gallium (Ga)	0.05	20	0	0	0	0	0	0
Germanium (Ge)	0.05	1	0	0	0	0	0	0
Hafnium (Hf)	0.02	6	0	0	0	0	0	0
Indium (In)	0.005	1	0	0	0	0	0	0
Lanthanum (La)	0.2	40	0	0	0	0	0	0
Lead (Pb)	0.2	35	0	0	0	0	0	0
Lithium (Li)	0.1	25	0	0	0	0	0	0
Manganese (Mn)	5	1000	0	0	0	0	0	0
Mercury (Hg)	0.01	0.06	0	0	0	0	0	0
Molybdenum (Mo)	0.05	1.2	4	4	4	0	0	0
Nickel (Ni)	0.2	50	1	1	1	0	0	0
Niobium (Nb)	0.05	10	0	0	0	0	0	0
Phosphorus (P)	10	800	0	0	0	0	0	0
Rhenium (Re)	0.001	0.0007	3	2	3	0	1	0
Rubidium (Rb)	0.1	150	0	0	0	0	0	0
Scandium (Sc)	0.1	7	0	0	0	0	0	0
Selenium (Se)	0.2	0.4	1	1	1	1	1	1
Silver (Ag)	0.01	0.05	2	2	2	2	2	2
Strontium (Sr)	0.2	250	0	0	0	0	0	0
Sulfur (S)	0.01	700	4	4	4	4	4	4
Tantalum (Ta)	0.01	2	0	0	0	0	0	0
Tellurium (Te)	0.01	0.001	6	6	6	6	6	6
Thallium (Tl)	0.02	0.2	0	0	0	0	0	0
Thorium (Th)	0.2	9	0	0	0	0	0	0
Tin (Sn)	0.2	4	0	0	0	0	0	0
Titanium (Ti)	0.005	5000	0	0	0	0	0	0
Tungsten (W)	0.05	1.5	0	0	0	0	0	0
Uranium (U)	0.05	2	1	1	1	0	0	0
Vanadium (V)	1	90	0	0	0	0	0	0
Yttrium (Y)	0.05	40	0	0	0	0	0	0
Zinc (Zn)	2	90	0	0	0	0	0	0
Zirconium (Zr)	0.5	400	0	0	0	0	0	0

Notes: GAI's greater than or equal to 3 are highlighted. Apparent gold enrichment is an artifact of the laboratory Limit of Reporting (LoR)

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

2. When no GARD Guide value is available for particular element, then values are taken from Bowen (1979) Environmental Chemistry of the Elements, p 60-61.

3. If no guide value from GARD or Bowen H.J.M. (1979) exists, up to date, curated data is provided by CRC Handbook of Chemistry and Physics (2000).

Table B4: Multi-Element Test Results for Water Extracts from mine materials and tailings from the Graphinex Project

		RGS Sample Number →		2023072_C01	2023072_C02	2023072_C03	2023072_C04
		Sample Date →		07/11/2024	07/11/2024	07/11/2024	07/11/2024
		ALS Laboratory ID →		EB2438700001	EB2438700002	EB2438700003	EB2438700004
Parameters	**Limit of Reporting**	Aquatic Ecosystems (freshwater)[1]	Livestock Drinking Water[2]	Soil	Overburden: Claystone	Overburden: Sandstone	Overburden: Siltstone
pH	0.01 pH unit	6 to 9	-	7.07	9.21	7.70	8.08
Electrical Conductivity	1 µS/cm	<1,000#	3,580	63	451	110	270
Carbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	<1	36	<1	<1
Bicarbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	14	89	26	87
Total Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	14	124	26	87
Net Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	14	124	26	87
Major Ions	All units mg/L			All units mg/L			
Calcium (Ca)	1	-	1,000	<1	<1	<1	<1
Magnesium (Mg)	1	-	-	<1	<1	<1	<1
Potassium (K)	1	-	-	<1	1.0	<1	2.0
Sodium (Na)	1	-	-	12.0	83.0	20.0	52.0
Chloride (Cl)	1	-	-	6.0	53.0	6.0	3.0
Fluoride (F)	0.1	-	2	0.4	7.8	3.4	3.6
Sulfate (SO_4^{2-})	1	-	1,000	7.0	11.0	9.0	31.0
Trace Metals/Metalloids	All units mg/L			All units mg/L			
Aluminium (Al)	0.01	0.055	5	<0.01	0.21	0.15	0.14
Antimony (Sb)	0.001	-	-	0.002	<0.001	0.002	0.007
Arsenic (As)	0.001	0.024*	0.5	0.001	0.037	0.055	0.086
Barium (Ba)	0.001	-	-	0.009	0.003	0.102	0.394
Beryllium (Be)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Boron (B)	0.05	0.37	5	<0.05	0.07	0.38	0.6
Cadmium (Cd)	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	<0.0001
Caesium (Cs)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Cerium (Ce)	0.001	-	-	0.002	<0.001	<0.001	<0.001
Chromium (Cr)	0.001	0.001**	1***	<0.001	0.003	0.002	<0.001
Cobalt (Co)	0.001	-	1	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	0.001	0.0014	1	0.006	<0.001	<0.001	<0.001
Dysprosium (Dy)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Erbium (Er)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Europium (Eu)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Gadolinium (Gd)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Gallium (Ga)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Hafnium (Hf)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Holmium (Ho)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Indium (In)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	0.05	-	-	<0.05	0.12	0.14	<0.05
Lanthanum (La)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Lead (Pb)	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001
Lithium (Li)	0.001	-	-	0.002	0.003	0.003	0.006
Lutetium (Lu)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Manganese (Mn)	0.001	1.9	-	0.002	0.001	0.017	0.006
Mercury (Hg)	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum (Mo)	0.001	-	0.15	0.002	0.006	0.048	0.182
Neodymium (Nd)	0.001	-	-	0.001	<0.001	<0.001	<0.001
Nickel (Ni)	0.001	0.011	1	0.001	<0.001	<0.001	<0.001
Praseodymium (Pr)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Rubidium (Rb)	0.001	-	-	<0.001	<0.001	<0.001	0.002
Samarium (Sm)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.01	0.011	0.02	<0.01	<0.01	<0.01	0.02
Silver (Ag)	0.001	0.00005	-	<0.001	<0.001	<0.001	<0.001
Strontium (Sr)	0.001	-	-	0.004	0.001	0.006	0.022
Tellurium (Te)	0.005	-	-	<0.005	<0.005	<0.005	<0.005
Terbium (Tb)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thallium (Tl)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thorium (Th)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thulium (Tm)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Tin (Sn)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	0.01	-	-	<0.01	<0.01	0.02	0.01
Uranium (U)	0.001	-	0.1	<0.001	<0.001	<0.001	<0.001
Vanadium (V)	0.01	-	-	<0.01	0.16	0.04	0.04
Ytterbium (Yb)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Yttrium (Y)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	0.005	0.008	20	0.026	<0.005	0.009	0.009
Zirconium (Zr)	0.005	-	-	<0.005	<0.005	<0.005	<0.005
Total Petroleum Hydrocrabons	All units mg/L			All units mg/L			
C10 - C14 Fraction	50	-	-	90	70	60	<50
C15 - C28 Fraction	100	-	-	<100	<100	<100	<100
C29 - C36 Fraction	50	-	-	<50	<50	<50	<50
C10 - C36 Fraction (sum)	50	-	-	90	70	60	<50
Total Recoverable Hydrocrabons	All units mg/L			All units mg/L			
>C10 - C16 Fraction	100	-	-	<100	<100	<100	<100
>C16 - C34 Fraction	100	-	-	<100	<100	<100	<100
>C34 - C40 Fraction	100	-	-	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	100	-	-	<100	<100	<100	<100

Notes: < indicates concentration less than the detection limit. Shaded cells exceed applied guideline values. * 0.013 mg/L for pentavalent Arsenic (V). 0.024 mg/L for trivalent Arsenic (III). ** Cr (VI) = hexavalent. *** Total Cr

for still water bodies only, moving rivers at low flow rates should not exceed 2,200 µS/cm.

1. ANZG (2018). Trigger values for freshwater aquatic ecosystems (95 % species protection level)
2. ANZG (2018). Recommended guideline limits for Livestock Drinking Water.

Table B4: Multi-Element Test Results for Water Extracts from mine materials and tailings from the Graphinex Project

		RGS Sample Number →		2023072_C05	2023072_C06	2023072_C07	2023072_C08
		Sample Date →		07/11/2024	07/11/2024	07/11/2024	07/11/2024
		ALS Laboratory ID →		EB2438700005	EB2438700006	EB2438700007	EB2438700008
Parameters	**Limit of Reporting**	Aquatic Ecosystems (freshwater)[1]	Livestock Drinking Water[2]	Waste Rock: Dolerite + Metasediments	Low Grade Ore: NAF - B	Low Grade Ore: PAF	Ore Body: NAF - B/ NAF/ Unc
pH	0.01 pH unit	6 to 9	-	9.07	8.62	7.17	8.28
Electrical Conductivity	1 µS/cm	<1,000#	3,580	176	128	417	198
Carbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	18	8	<1	<1
Bicarbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	59	43	43	65
Total Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	78	51	43	65
Net Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	78	51	43	65
Major Ions	All units mg/L			All units mg/L			
Calcium (Ca)	1	-	1,000	<1	4	52	8
Magnesium (Mg)	1	-	-	<1	<1	5.0	<1
Potassium (K)	1	-	-	10.0	10.0	9.0	9.0
Sodium (Na)	1	-	-	31.0	17.0	12.0	27.0
Chloride (Cl)	1	-	-	2.0	3.0	6.0	5.0
Fluoride (F)	0.1	-	2	1.4	1.8	1.7	1.2
Sulfate (SO_4^{2-})	1	-	1,000	7.0	4.0	150.0	27.0
Trace Metals/Metalloids	All units mg/L			All units mg/L			
Aluminium (Al)	0.01	0.055	5	0.37	0.26	<0.01	0.1
Antimony (Sb)	0.001	-	-	0.003	0.018	0.002	0.02
Arsenic (As)	0.001	0.024*	0.5	0.01	0.138	0.001	0.036
Barium (Ba)	0.001	-	-	0.339	0.532	0.532	0.566
Beryllium (Be)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Boron (B)	0.05	0.37	5	0.21	0.17	0.2	0.18
Cadmium (Cd)	0.0001	0.0002	0.01	<0.0001	<0.0001	0.0002	<0.0001
Caesium (Cs)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Cerium (Ce)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	0.001	0.001**	1***	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	0.001	-	1	<0.001	<0.001	0.034	<0.001
Copper (Cu)	0.001	0.0014	1	<0.001	<0.001	<0.001	<0.001
Dysprosium (Dy)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Erbium (Er)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Europium (Eu)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Gadolinium (Gd)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Gallium (Ga)	0.001	-	-	0.003	0.003	<0.001	0.002
Hafnium (Hf)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Holmium (Ho)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Indium (In)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	0.05	-	-	<0.05	<0.05	<0.05	<0.05
Lanthanum (La)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Lead (Pb)	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001
Lithium (Li)	0.001	-	-	0.003	0.004	0.018	0.007
Lutetium (Lu)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Manganese (Mn)	0.001	1.9	-	0.001	0.002	1.07	0.005
Mercury (Hg)	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum (Mo)	0.001	-	0.15	0.022	0.006	0.002	0.038
Neodymium (Nd)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Nickel (Ni)	0.001	0.011	1	<0.001	<0.001	0.048	<0.001
Praseodymium (Pr)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Rubidium (Rb)	0.001	-	-	0.016	0.02	0.026	0.021
Samarium (Sm)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.01	0.011	0.02	<0.01	<0.01	<0.01	0.01
Silver (Ag)	0.001	0.00005	-	<0.001	<0.001	<0.001	<0.001
Strontium (Sr)	0.001	-	-	0.015	0.029	0.103	0.058
Tellurium (Te)	0.005	-	-	<0.005	<0.005	<0.005	<0.005
Terbium (Tb)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thallium (Tl)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thorium (Th)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thulium (Tm)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Tin (Sn)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Uranium (U)	0.001	-	0.1	<0.001	<0.001	<0.001	<0.001
Vanadium (V)	0.01	-	-	0.02	<0.01	<0.01	<0.01
Ytterbium (Yb)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Yttrium (Y)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	0.005	0.008	20	0.007	0.01	0.226	0.032
Zirconium (Zr)	0.005	-	-	<0.005	<0.005	<0.005	<0.005
Total Petroleum Hydrocrabons	All units mg/L			All units mg/L			
C10 - C14 Fraction	50	-	-	70	100	70	60
C15 - C28 Fraction	100	-	-	<100	<100	<100	<100
C29 - C36 Fraction	50	-	-	<50	<50	<50	<50
C10 - C36 Fraction (sum)	50	-	-	70	100	70	60
Total Recoverable Hydrocrabons	All units mg/L			All units mg/L			
>C10 - C16 Fraction	100	-	-	<100	<100	<100	<100
>C16 - C34 Fraction	100	-	-	<100	<100	<100	<100
>C34 - C40 Fraction	100	-	-	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	100	-	-	<100	<100	<100	<100

Notes: < indicates concentration less than the detection limit. Shaded cells exceed applied guideline values. * 0.013 mg/L for pentavalent Arsenic (V). 0.024 mg/L for trivalent Arsenic (III). ** Cr (VI) = hexavalent. *** Total Cr

for still water bodies only, moving rivers at low flow rates should not exceed 2,200 µS/cm.

1. ANZG (2018). Trigger values for freshwater aquatic ecosystems (95 % species protection level)
2. ANZG (2018). Recommended guideline limits for Livestock Drinking Water.

Table B4: Multi-Element Test Results for Water Extracts from mine materials and tailings from the Graphinex Project

		RGS Sample Number →		2023072_C09	2023072_C10	2023072_C11	2023072_C101
		Sample Date →		07/11/2024	07/11/2024	07/11/2024	17/10/2024
		ALS Laboratory ID →		EB2438700009	EB2438700010	EB2438700011	EB2435821001
Parameters	**Limit of Reporting**	Aquatic Ecosystems (freshwater)[1]	Livestock Drinking Water[2]	Ore Body: PAF - LC/ Low S	Ore Body: PAF/ Mod S	Ore Body: PAF/ High S	Master Comp P80 0.3mm Sighter Float #14 (Batch 1)
pH	0.01 pH unit	6 to 9	-	7.62	7.60	6.81	8.70
Electrical Conductivity	1 µS/cm	<1,000#	3,580	416	154	128	112
Carbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	<1	<1	<1	<1
Bicarbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	71	35	11	22
Total Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	71	35	11	22
Net Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	71	35	11	22
Major Ions	All units mg/L			All units mg/L			
Calcium (Ca)	1	-	1,000	60	11	6	13
Magnesium (Mg)	1	-	-	4.0	<1	1.0	<1
Potassium (K)	1	-	-	11.0	11.0	9.0	5.0
Sodium (Na)	1	-	-	10.0	10.0	9.0	3.0
Chloride (Cl)	1	-	-	9.0	<1	11.0	14.0
Fluoride (F)	0.1	-	2	2.0	2.1	3.5	1.2
Sulfate (SO_4^{2-})	1	-	1,000	124.0	25.0	27.0	21.0
Trace Metals/Metalloids	All units mg/L			All units mg/L			
Aluminium (Al)	0.01	0.055	5	<0.01	0.06	<0.01	0.21
Antimony (Sb)	0.001	-	-	0.008	0.005	0.002	0.042
Arsenic (As)	0.001	0.024*	0.5	0.002	0.001	<0.001	0.003
Barium (Ba)	0.001	-	-	0.671	0.498	0.507	0.007
Beryllium (Be)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Boron (B)	0.05	0.37	5	0.17	0.16	0.15	<0.05
Cadmium (Cd)	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	<0.0001
Caesium (Cs)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Cerium (Ce)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	0.001	0.001**	1***	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	0.001	-	1	0.001	<0.001	<0.001	<0.001
Copper (Cu)	0.001	0.0014	1	<0.001	<0.001	<0.001	<0.001
Dysprosium (Dy)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Erbium (Er)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Europium (Eu)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Gadolinium (Gd)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Gallium (Ga)	0.001	-	-	<0.001	<0.001	<0.001	0.001
Hafnium (Hf)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Holmium (Ho)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Indium (In)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	0.05	-	-	<0.05	<0.05	<0.05	<0.05
Lanthanum (La)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Lead (Pb)	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001
Lithium (Li)	0.001	-	-	0.017	0.013	0.016	0.004
Lutetium (Lu)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Manganese (Mn)	0.001	1.9	-	0.608	0.027	0.13	0.04
Mercury (Hg)	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum (Mo)	0.001	-	0.15	0.005	0.007	0.004	0.003
Neodymium (Nd)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Nickel (Ni)	0.001	0.011	1	0.007	<0.001	<0.001	<0.001
Praseodymium (Pr)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Rubidium (Rb)	0.001	-	-	0.03	0.03	0.022	0.008
Samarium (Sm)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.01	0.011	0.02	<0.01	<0.01	<0.01	<0.01
Silver (Ag)	0.001	0.00005	-	<0.001	<0.001	<0.001	<0.001
Strontium (Sr)	0.001	-	-	0.078	0.043	0.035	0.038
Tellurium (Te)	0.005	-	-	<0.005	<0.005	<0.005	<0.005
Terbium (Tb)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thallium (Tl)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thorium (Th)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thulium (Tm)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Tin (Sn)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Uranium (U)	0.001	-	0.1	<0.001	<0.001	<0.001	<0.001
Vanadium (V)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Ytterbium (Yb)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Yttrium (Y)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	0.005	0.008	20	0.23	0.06	0.066	<0.005
Zirconium (Zr)	0.005	-	-	<0.005	<0.005	<0.005	<0.005
Total Petroleum Hydrocrabons	All units mg/L			All units mg/L			
C10 - C14 Fraction	50	-	-	60	50	60	80
C15 - C28 Fraction	100	-	-	<100	<100	<100	140
C29 - C36 Fraction	50	-	-	<50	<50	<50	<50
C10 - C36 Fraction (sum)	50	-	-	60	50	60	220
Total Recoverable Hydrocrabons	All units mg/L			All units mg/L			
>C10 - C16 Fraction	100	-	-	<100	<100	<100	140
>C16 - C34 Fraction	100	-	-	<100	<100	<100	<100
>C34 - C40 Fraction	100	-	-	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	100	-	-	<100	<100	<100	140

Notes: < indicates concentration less than the detection limit. Shaded cells exceed applied guideline values. * 0.013 mg/L for pentavalent Arsenic (V). 0.024 mg/L for trivalent Arsenic (III). ** Cr (VI) = hexavalent. *** Total Cr

for still water bodies only, moving rivers at low flow rates should not exceed 2,200 µS/cm.

1. ANZG (2018). Trigger values for freshwater aquatic ecosystems (95 % species protection level)
2. ANZG (2018). Recommended guideline limits for Livestock Drinking Water.

Table B4: Multi-Element Test Results for Water Extracts from mine materials and tailings from the Graphinex Project

		RGS Sample Number →		2023072_C102	2023072_C103	2023072_C104	2023072_C105
		Sample Date →		17/10/2024	17/10/2024	17/10/2024	17/10/2024
		ALS Laboratory ID →		EB2435821002	EB2435821003	EB2435821004	EB2435821005
Parameters	**Limit of Reporting**	Aquatic Ecosystems (freshwater)[1]	Livestock Drinking Water[2]	Master Comp P80 0.3mm Sighter Float #15 (Batch 1)	Master Comp P80 0.3mm Sighter Float #16 (Batch 1)	Master Comp P80 0.3mm Sighter Float #16 (Batch 1)	Master Comp P80 0.3mm Sighter Float #16 (Batch 1)
pH	0.01 pH unit	6 to 9	-	8.50	8.60	8.40	8.70
Electrical Conductivity	1 µS/cm	<1,000#	3,580	135	146	160	135
Carbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	<1	<1	<1	<1
Bicarbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	26	27	28	27
Total Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	26	27	28	27
Net Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	26	27	28	27
Major Ions	All units mg/L			All units mg/L			
Calcium (Ca)	1	-	1,000	18	16	20	14
Magnesium (Mg)	1	-	-	1.0	<1	<1	<1
Potassium (K)	1	-	-	6.0	5.0	6.0	6.0
Sodium (Na)	1	-	-	3.0	3.0	3.0	3.0
Chloride (Cl)	1	-	-	16.0	14.0	13.0	18.0
Fluoride (F)	0.1	-	2	1.0	1.2	1.2	1.2
Sulfate (SO_4^{2-})	1	-	1,000	30.0	31.0	40.0	22.0
Trace Metals/Metalloids	All units mg/L			All units mg/L			
Aluminium (Al)	0.01	0.055	5	0.16	0.16	0.12	0.19
Antimony (Sb)	0.001	-	-	0.002	0.002	0.002	0.002
Arsenic (As)	0.001	0.024*	0.5	0.003	0.003	0.002	0.003
Barium (Ba)	0.001	-	-	0.007	0.005	0.006	0.004
Beryllium (Be)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Bismuth (Bi)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Boron (B)	0.05	0.37	5	<0.05	<0.05	<0.05	<0.05
Cadmium (Cd)	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	<0.0001
Caesium (Cs)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Cerium (Ce)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Chromium (Cr)	0.001	0.001**	1***	<0.001	<0.001	<0.001	<0.001
Cobalt (Co)	0.001	-	1	<0.001	<0.001	<0.001	<0.001
Copper (Cu)	0.001	0.0014	1	<0.001	<0.001	<0.001	<0.001
Dysprosium (Dy)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Erbium (Er)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Europium (Eu)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Gadolinium (Gd)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Gallium (Ga)	0.001	-	-	<0.001	<0.001	<0.001	0.001
Hafnium (Hf)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Holmium (Ho)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Indium (In)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	0.05	-	-	<0.05	<0.05	<0.05	<0.05
Lanthanum (La)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Lead (Pb)	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001
Lithium (Li)	0.001	-	-	0.006	0.005	0.006	0.004
Lutetium (Lu)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Manganese (Mn)	0.001	1.9	-	0.076	0.069	0.136	0.043
Mercury (Hg)	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum (Mo)	0.001	-	0.15	0.004	0.003	0.003	0.004
Neodymium (Nd)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Nickel (Ni)	0.001	0.011	1	<0.001	<0.001	<0.001	<0.001
Praseodymium (Pr)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Rubidium (Rb)	0.001	-	-	0.009	0.009	0.01	0.008
Samarium (Sm)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Selenium (Se)	0.01	0.011	0.02	<0.01	<0.01	<0.01	<0.01
Silver (Ag)	0.001	0.00005	-	<0.001	<0.001	<0.001	<0.001
Strontium (Sr)	0.001	-	-	0.05	0.046	0.054	0.041
Tellurium (Te)	0.005	-	-	<0.005	<0.005	<0.005	<0.005
Terbium (Tb)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thallium (Tl)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thorium (Th)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Thulium (Tm)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Tin (Sn)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Titanium (Ti)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Uranium (U)	0.001	-	0.1	<0.001	<0.001	<0.001	<0.001
Vanadium (V)	0.01	-	-	<0.01	<0.01	<0.01	<0.01
Ytterbium (Yb)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Yttrium (Y)	0.001	-	-	<0.001	<0.001	<0.001	<0.001
Zinc (Zn)	0.005	0.008	20	<0.005	<0.005	<0.005	<0.005
Zirconium (Zr)	0.005	-	-	<0.005	<0.005	<0.005	<0.005
Total Petroleum Hydrocrabons	All units mg/L			All units mg/L			
C10 - C14 Fraction	50	-	-	100	100	70	150
C15 - C28 Fraction	100	-	-	230	150	140	240
C29 - C36 Fraction	50	-	-	<50	<50	<50	<50
C10 - C36 Fraction (sum)	50	-	-	330	250	210	390
Total Recoverable Hydrocrabons	All units mg/L			All units mg/L			
>C10 - C16 Fraction	100	-	-	190	170	120	290
>C16 - C34 Fraction	100	-	-	140	<100	<100	<100
>C34 - C40 Fraction	100	-	-	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	100	-	-	330	170	120	290

Notes: < indicates concentration less than the detection limit. Shaded cells exceed applied guideline values. * 0.013 mg/L for pentavalent Arsenic (V). 0.024 mg/L for trivalent Arsenic (III). ** Cr (VI) = hexavalent. *** Total Cr

for still water bodies only, moving rivers at low flow rates should not exceed 2,200 µS/cm.

1. ANZG (2018). Trigger values for freshwater aquatic ecosystems (95 % species protection level)
2. ANZG (2018). Recommended guideline limits for Livestock Drinking Water.

Table B4: Multi-Element Test Results for Water Extracts from mine materials and tailings from the Graphinex Project

		RGS Sample Number →		2024066_T1	2024066_T2	2024066_T3
		Sample Date →		01/04/2025	01/04/2025	01/04/2025
		ALS Laboratory ID →		EB2510944001	EB2510944002	EB2510944003
Parameters	**Limit of Reporting**	Aquatic Ecosystems (freshwater)[1]	Livestock Drinking Water[2]	Graphinex tailings supernatant Batch 2 - Tank 1	Graphinex tailings supernatant Batch 2 - Tank 2	Graphinex tailings supernatant Batch 2 - Tank 3
pH	0.01 pH unit	6 to 9	-	7.51	7.79	7.85
Electrical Conductivity	1 µS/cm	<1,000#	3,580	1,740	1,450	1,440
Carbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	<1	<1	<1
Bicarbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	150	154	149
Total Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	150	154	149
Net Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	143	149	145
Major Ions	All units mg/L			All units mg/L		
Calcium (Ca)	1	-	1,000	131	126	126
Magnesium (Mg)	1	-	-	66	57	58
Potassium (K)	1	-	-	47	35	35
Sodium (Na)	1	-	-	82	68	69
Chloride (Cl)	1	-	-	134	114	113
Fluoride (F)	0.1	-	2	1.8	2.3	2.4
Sulfate (SO_4^{2-})	1	-	1,000	526	449	459
Trace Metals/Metalloids	All units mg/L			All units mg/L		
Aluminium (Al)	0.01	0.055	5	<0.01	0.01	0.01
Antimony (Sb)	0.001	-	-	<0.001	<0.001	0.001
Arsenic (As)	0.001	0.024*	0.5	0.001	0.002	0.003
Barium (Ba)	0.001	-	-	0.096	0.104	0.111
Beryllium (Be)	0.001	-	-	<0.001	<0.001	<0.001
Bismuth (Bi)	0.001	-	-	<0.001	<0.001	<0.001
Boron (B)	0.05	0.37	5	<0.05	<0.05	<0.05
Cadmium (Cd)	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001
Caesium (Cs)	0.001	-	-	<0.001	<0.001	<0.001
Cerium (Ce)	0.001	-	-	<0.001	<0.001	<0.001
Chromium (Cr)	0.001	0.001**	1***	<0.001	<0.001	<0.001
Cobalt (Co)	0.001	-	1	<0.001	<0.001	<0.001
Copper (Cu)	0.001	0.0014	1	<0.001	<0.001	<0.001
Dysprosium (Dy)	0.001	-	-	<0.001	<0.001	<0.001
Erbium (Er)	0.001	-	-	<0.001	<0.001	<0.001
Europium (Eu)	0.001	-	-	<0.001	<0.001	<0.001
Gadolinium (Gd)	0.001	-	-	<0.001	<0.001	<0.001
Gallium (Ga)	0.001	-	-	<0.001	<0.001	<0.001
Hafnium (Hf)	0.01	-	-	<0.01	<0.01	<0.01
Holmium (Ho)	0.001	-	-	<0.001	<0.001	<0.001
Indium (In)	0.001	-	-	<0.001	<0.001	<0.001
Iron (Fe)	0.05	-	-	<0.05	<0.05	<0.05
Lanthanum (La)	0.001	-	-	<0.001	<0.001	<0.001
Lead (Pb)	0.001	0.0034	0.1	<0.001	<0.001	<0.001
Lithium (Li)	0.001	-	-	0.031	0.014	0.014
Lutetium (Lu)	0.001	-	-	<0.001	<0.001	<0.001
Manganese (Mn)	0.001	1.9	-	0.708	1.04	1.06
Mercury (Hg)	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001
Molybdenum (Mo)	0.001	-	0.15	0.019	0.019	0.018
Neodymium (Nd)	0.001	-	-	<0.001	<0.001	<0.001
Nickel (Ni)	0.001	0.011	1	0.003	0.004	0.005
Praseodymium (Pr)	0.001	-	-	<0.001	<0.001	<0.001
Rubidium (Rb)	0.001	-	-	0.149	0.104	0.1
Samarium (Sm)	0.001	-	-	<0.001	<0.001	<0.001
Selenium (Se)	0.01	0.011	0.02	<0.01	<0.01	<0.01
Silver (Ag)	0.001	0.00005	-	<0.001	<0.001	<0.001
Strontium (Sr)	0.001	-	-	0.458	0.427	0.426
Tellurium (Te)	0.005	-	-	<0.005	<0.005	<0.005
Terbium (Tb)	0.001	-	-	<0.001	<0.001	<0.001
Thallium (Tl)	0.001	-	-	<0.001	<0.001	<0.001
Thorium (Th)	0.001	-	-	<0.001	<0.001	<0.001
Thulium (Tm)	0.001	-	-	<0.001	<0.001	<0.001
Tin (Sn)	0.001	-	-	<0.001	<0.001	<0.001
Titanium (Ti)	0.01	-	-	<0.01	<0.01	<0.01
Uranium (U)	0.001	-	0.1	0.001	0.002	0.002
Vanadium (V)	0.01	-	-	<0.01	<0.01	<0.01
Ytterbium (Yb)	0.001	-	-	<0.001	<0.001	<0.001
Yttrium (Y)	0.001	-	-	<0.001	<0.001	<0.001
Zinc (Zn)	0.005	0.008	20	<0.005	<0.005	<0.005
Zirconium (Zr)	0.005	-	-	<0.005	<0.005	<0.005
Total Petroleum Hydrocrabons	All units mg/L			All units mg/L		
C10 - C14 Fraction	50	-	-	3,950	4,620	4,230
C15 - C28 Fraction	100	-	-	8,560	8,960	7,370
C29 - C36 Fraction	50	-	-	90	90	100
C10 - C36 Fraction (sum)	50	-	-	12,600	13,700	11,700
Total Recoverable Hydrocrabons	All units mg/L			All units mg/L		
>C10 - C16 Fraction	100	-	-	7,860	8,290	6,690
>C16 - C34 Fraction	100	-	-	2,740	2,800	2,470
>C34 - C40 Fraction	100	-	-	<100	<100	<100
>C10 - C40 Fraction (sum)	100	-	-	10,600	11,100	9,160

Notes: < indicates concentration less than the detection limit. Shaded cells exceed applied guideline values. * 0.013 mg/L for pentavalent Arsenic (V). 0.024 mg/L for trivalent Arsenic (III). ** Cr (VI) = hexavalent. *** Total Cr

for still water bodies only, moving rivers at low flow rates should not exceed 2,200 µS/cm.

1. ANZG (2018). Trigger values for freshwater aquatic ecosystems (95 % species protection level)
2. ANZG (2018). Recommended guideline limits for Livestock Drinking Water.

Table B4: Multi-Element Test Results for Water Extracts from mine materials and tailings from the Graphinex Project

		RGS Sample Number →		2024066_001	2024066_002	2024066_003
		Sample Date →		10/04/2025	10/04/2025	10/04/2025
		ALS Laboratory ID →		EB2512414001	EB2512414002	EB2512414003
Parameters	**Limit of Reporting**	Aquatic Ecosystems (freshwater)[1]	Livestock Drinking Water[2]	Tailings Solid - Tank 1 (Batch 2)	Tailings Solid - Tank 2 (Batch 2)	Tailings Solid - Tank 3 (Batch 2)
pH	0.01 pH unit	6 to 9	-	8.20	8.40	8.30
Electrical Conductivity	1 µS/cm	<1,000#	3,580	397	333	394
Carbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	<1	<1	<1
Bicarbonate Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	31	29	30
Total Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	31	29	30
Net Alkalinity (mg $CaCO_3$/L)	1 mg/L	-	-	31	29	30
Major Ions	All units mg/L			All units mg/L		
Calcium (Ca)	1	-	1,000	50	44	48
Magnesium (Mg)	1	-	-	5	4	4
Potassium (K)	1	-	-	6	6	6
Sodium (Na)	1	-	-	7	6	6
Chloride (Cl)	1	-	-	34	35	24
Fluoride (F)	0.1	-	2	1.2	1.3	1.3
Sulfate (SO_4^{2-})	1	-	1,000	122	95	112
Trace Metals/Metalloids	All units mg/L			All units mg/L		
Aluminium (Al)	0.01	0.055	5	0.07	0.07	0.07
Antimony (Sb)	0.001	-	-	0.001	0.001	0.001
Arsenic (As)	0.001	0.024*	0.5	<0.001	<0.001	<0.001
Barium (Ba)	0.001	-	-	0.054	0.048	0.043
Beryllium (Be)	0.001	-	-	<0.001	<0.001	<0.001
Bismuth (Bi)	0.001	-	-	<0.001	<0.001	<0.001
Boron (B)	0.05	0.37	5	0.11	0.08	0.07
Cadmium (Cd)	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001
Caesium (Cs)	0.001	-	-	<0.001	<0.001	<0.001
Cerium (Ce)	0.001	-	-	<0.001	<0.001	<0.001
Chromium (Cr)	0.001	0.001**	1***	<0.001	<0.001	<0.001
Cobalt (Co)	0.001	-	1	<0.001	<0.001	<0.001
Copper (Cu)	0.001	0.0014	1	<0.001	<0.001	<0.001
Dysprosium (Dy)	0.001	-	-	<0.001	<0.001	<0.001
Erbium (Er)	0.001	-	-	<0.001	<0.001	<0.001
Europium (Eu)	0.001	-	-	<0.001	<0.001	<0.001
Gadolinium (Gd)	0.001	-	-	<0.001	<0.001	<0.001
Gallium (Ga)	0.001	-	-	<0.001	<0.001	<0.001
Hafnium (Hf)	0.01	-	-	<0.01	<0.01	<0.01
Holmium (Ho)	0.001	-	-	<0.001	<0.001	<0.001
Indium (In)	0.001	-	-	<0.001	<0.001	<0.001
Iron (Fe)	0.05	-	-	<0.05	<0.05	<0.05
Lanthanum (La)	0.001	-	-	<0.001	<0.001	<0.001
Lead (Pb)	0.001	0.0034	0.1	<0.001	<0.001	<0.001
Lithium (Li)	0.001	-	-	0.003	0.002	0.003
Lutetium (Lu)	0.001	-	-	<0.001	<0.001	<0.001
Manganese (Mn)	0.001	1.9	-	0.056	0.049	0.074
Mercury (Hg)	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001
Molybdenum (Mo)	0.001	-	0.15	0.004	0.005	0.004
Neodymium (Nd)	0.001	-	-	<0.001	<0.001	<0.001
Nickel (Ni)	0.001	0.011	1	<0.001	<0.001	<0.001
Praseodymium (Pr)	0.001	-	-	<0.001	<0.001	<0.001
Rubidium (Rb)	0.001	-	-	0.017	0.02	0.019
Samarium (Sm)	0.001	-	-	<0.001	<0.001	<0.001
Selenium (Se)	0.01	0.011	0.02	<0.01	<0.01	<0.01
Silver (Ag)	0.001	0.00005	-	<0.001	<0.001	<0.001
Strontium (Sr)	0.001	-	-	0.118	0.11	0.116
Tellurium (Te)	0.005	-	-	<0.005	<0.005	<0.005
Terbium (Tb)	0.001	-	-	<0.001	<0.001	<0.001
Thallium (Tl)	0.001	-	-	<0.001	<0.001	<0.001
Thorium (Th)	0.001	-	-	<0.001	<0.001	<0.001
Thulium (Tm)	0.001	-	-	<0.001	<0.001	<0.001
Tin (Sn)	0.001	-	-	<0.001	<0.001	<0.001
Titanium (Ti)	0.01	-	-	<0.01	<0.01	<0.01
Uranium (U)	0.001	-	0.1	<0.001	<0.001	<0.001
Vanadium (V)	0.01	-	-	<0.01	<0.01	<0.01
Ytterbium (Yb)	0.001	-	-	<0.001	<0.001	<0.001
Yttrium (Y)	0.001	-	-	<0.001	<0.001	<0.001
Zinc (Zn)	0.005	0.008	20	<0.005	<0.005	<0.005
Zirconium (Zr)	0.005	-	-	<0.005	<0.005	<0.005
Total Petroleum Hydrocrabons	All units mg/L			All units mg/L		
C10 - C14 Fraction	50	-	-	80	60	<50
C15 - C28 Fraction	100	-	-	280	280	220
C29 - C36 Fraction	50	-	-	<50	<50	<50
C10 - C36 Fraction (sum)	50	-	-	360	340	220
Total Recoverable Hydrocrabons	All units mg/L			All units mg/L		
>C10 - C16 Fraction	100	-	-	190	190	120
>C16 - C34 Fraction	100	-	-	170	150	130
>C34 - C40 Fraction	100	-	-	<100	<100	<100
>C10 - C40 Fraction (sum)	100	-	-	360	340	250

Notes: < indicates concentration less than the detection limit. Shaded cells exceed applied guideline values. * 0.013 mg/L for pentavalent Arsenic (V). 0.024 mg/L for trivalent Arsenic (III). ** Cr (VI) = hexavalent. *** Total Cr

for still water bodies only, moving rivers at low flow rates should not exceed 2,200 µS/cm.

1. ANZG (2018). Trigger values for freshwater aquatic ecosystems (95 % species protection level)
2. ANZG (2018). Recommended guideline limits for Livestock Drinking Water.

Table B5: NORM Results for Mine Materials and Tailings from the Graphinex Project

	RGS Sample Number →		2026029_C101	2026029_C102	2026029_C103	2026029_C104	2026029_C105	2026029_C106
	Sampling Date →		27/03/2026	27/03/2026	27/03/2026	27/03/2026	27/03/2026	27/03/2026
	ALS Laboratory ID →		EB2611215001	EB2611215002	EB2611215003	EB2611215004	EB2611215005	EB2611215006
	Client ID →		Soil	Overburden	Low Grade Ore	Waste rock	Ore body	Tailings - Batch 2
Parameters	Units	LOR						
Solid Fraction								
Actinium 227 (Ac-227)	Bq/kg DW	1	<1.8	<2.3	<4.5	7.1	<8.8	<2.9
Lead 210 (Pb-210)	Bq/kg DW	50	<50	<50	60	84	72	56
Potassium 40 (K-40)	Bq/kg DW	10	54	485	973	1350	1200	1320
Protactinium 231 (Pa-231)	Bq/kg DW	5	<7.5	<11.0	<16.0	<20.0	<28.0	<13.0
Radium 223 (Ra-223)	Bq/kg DW	1	<2.1	<2.8	<3.8	7.2	<11.0	<3.5
Radium 226 (Ra-226)	Bq/kg DW	1	14.1	25.2	86.4	125	96.7	73.6
Radium 228 (Ra-228)	Bq/kg DW	1	18.5	36	95.3	85.5	83.2	69.7
Thorium 227 (Th-227)	Bq/kg DW	1	<1.8	<2.3	<4.5	7.1	<8.8	<2.9
Thorium 228 (Th-228)	Bq/kg DW	50	19.8	36.9	94.2	82.1	83	70.2
Thorium 230 (Th-230)	Bq/kg DW	10	<70	<95	<150	135	<140	<130
Thorium 234 (Th-234)	Bq/kg DW	1	17	27	79	126	95	67
Uranium 235 (U-235)	Bq/kg DW	1	1.1	1.9	3.9	7.1	5.1	4.1
Uranium 238 (U-238)	Bq/kg DW	10	17	27	79	126	95	67
Soluble Fraction (TCLP)								
Gross alpha	Bq/L	0.04	<0.08	0.23	0.56	0.74	0.34	0.48
Gross beta	Bq/L	0.1	<0.26	0.32	0.71	0.47	0.66	0.72

Notes: < indicates less than the laboratory limit of reporting.

Attachment C: KLC data and plots

KLC 1 Soil: NAF - Barren (Free Leach)

Weight (kg)	4.00	Total S (%)	0.01	ANC	0.80	
pH (1:5)	5.45	Scr (%)	----	NAPP	-0.49	
EC (µS/cm)	42.00	MPA	0.31	ANC:MPA	2.61	

Date			17-Apr-25	15-May-25	11-Jun-25	09-Jul-25	07-Aug-25	03-Sep-25	02-Oct-25
Number of Weeks			0	4	8	12	16	20	24
Leach Number			1	2	3	4	5	6	7
ALS Laboratory Number			EB2513490001	EB2516624001	EB2520078001	EB2523737001	EB2527411001	EB2530773001	EB2534609001
Volume On (L)			2.2	1.0	1.0	1.2	1.0	1.0	1.0
Volume Off (L)			1.011	0.534	0.425	0.563	0.575	0.651	0.872
Cum. Volume (L)			1.01	1.55	1.97	2.53	3.11	3.76	4.63
pH (RGS Measurement)	6 to 9	-	6.39	6.52	6.23	6.72	6.95	6.77	6.89
pH (ALS Measurement)			6.14	5.99	6.74	6.67	6.58	6.66	5.82
pH (deionised water used in test)		-	7.05	5.45	6.41	7.02	5.86	6.63	5.83
EC (RGS Measurement) (µS/cm)	<1,000 #	3,580^	249	138	98	75	54	44	37
EC (ALS Measurement) (µS/cm)			286	155	89	101	50	47	61
Acidity (mg/L as $CaCO_3$)*	-	-	21	12	16	14	9	10	14.0
Hydroxide Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-	-	26	8	25	14	14	14	5
Total Alkalinity (mg/L as CaCO)*	-	-	26	8	25	14	14	14	5
Net Alkalinity (mg/L as CaCO)*	-	-	5	-4	9	0	5	4	-9

Major Ions (mg/L)	Elements	LoR	Aquatic Ecosystems (Freshwater)[1]	Livestock Drinking Water[2]						
Calcium	Ca	1	-	1000	1	<1	2	2	<1	2	1
Magnesium	Mg	1	-	-	<1	<1	1	2	<1	2	<1
Sodium	Na	1	-	-	50	27	22	22	14	16	13
Potassium	K	1	-	-	2	<1	1	1	<1	1	<1
Chloride	Cl	1	-	-	39	15	6	<5	1	<1	1
Fluoride	F[4]	0.1	-	2	0.2	0.3	0.2	0.3	0.4	0.4	0.5
Sulfate	SO	1	-	1000	20	17	11	7	5	2	16
Total Organic Carbon	Org_C	1	-	-	40	27	82	26	17	16	13
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**						
Aluminium	Al	0.01	0.055	5	1.16	0.84	1.27	2.03	1.64	1.48	0.45
Antimony	Sb	0.001	-	-	0.001	0.005	0.001	0.001	0.002	<0.001	0.002
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.002	0.001	0.001	0.001	0.001	0.001	<0.001
Barium	Ba	0.001	-	-	0.049	0.029	0.147	0.173	0.09	0.18	0.12
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001
Boron	B	0.05	0.37	5	0.06	0.12	0.09	0.06	0.06	0.06	<0.05
Cadmium	Cd	0.0001	0.0002	0.01	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	Cr	0.001	0.001 (hex)*	1	0.002	0.003	0.003	0.110	0.003	0.003	0.001
Cobalt	Co	0.001	-	1	0.007	0.004	0.006	0.006	0.003	0.004	<0.001
Copper	Cu	0.001	0.0014	1	0.018	0.032	0.026	0.026	0.026	0.019	0.015
Iron	Fe	0.05	-	-	0.85	1.08	1.02	1.67	1.06	0.92	0.13
Lead	Pb	0.001	0.0034	0.1	0.003	0.002	0.004	0.004	0.002	0.004	0.001
Manganese	Mn	0.001	1.9	-	0.118	0.04	0.136	0.141	0.056	0.096	0.035
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	<0.001	0.003	<0.001	<0.001	0.001	<0.001	0.002
Nickel	Ni	0.001	0.011	1	0.003	0.006	0.005	0.006	0.004	0.005	0.002
Selenium	Se	0.01	0.011	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	Th	0.001	-	-	<0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	0.255	0.223	0.734	0.825	0.386	0.667	0.293
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	2.04	0.94	0.90	0.42	0.41	0.32	0.46
Total Cations	meq/L	0.01	-	-	2.28	1.17	1.16	1.25	0.61	0.98	0.62
Ionic Balance	%	0.01	-	-	----	----	----	----	----	----	----

Calculations**	Elements								
SO_4 Release Rate	SO[4]	5	2	1	1	1	0	3
Cumulative SO Release	Cum. SO	5	7	8	9	10	11	14
Ca Release Rate	Ca	0.3	0.1	0.2	0.3	0.1	0.3	0.2
Cumulative Ca Release	Cum. Ca	0.3	0.3	0.5	0.8	0.9	1.2	1.4
Mg Release Rate	Mg	12.6	3.6	2.3	3.1	2.0	2.6	2.8
Cumulative Mg Release	Cum. Mg	12.6	16.2	18.6	21.7	23.7	26.3	29.1
Residual ANC (%)	Res. ANC	93.6	91.7	90.5	88.8	87.8	86.4	84.9
Residual Sulfur (%)	Res. S[4]	98.3	97.6	97.2	96.8	96.6	96.5	95.3
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)	0.1	0.2	0.1	0.1	0.1	0.0	0.3

Notes:

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KLC 1 Soil: NAF - Barren (Free Leach)

Weight (kg)											
pH (1:5)											
EC (µS/cm)											
Date					17-Dec-25	21-Jan-26	18-Feb-26	18-Mar-26	15-Apr-26	13-May-26	10-Jun-26
Number of Weeks					35	40	44	48	52	56	60
Leach Number					8	9	10	11	12	13	14
ALS Laboratory Number					EB2545238001	EB2602305001	EB2606057001	EB2609975001	EB2613493001	EB2617014001	EB2621399001
Volume On (L)					1.0	1.5	1.5	1.5	1.2	1.5	1.5
Volume Off (L)					0.533	0.770	0.811	0.864	0.644	0.945	0.918
Cum. Volume (L)					5.17	5.94	6.75	7.61	8.25	9.20	10.12
pH (RGS Measurement)		6 to 9		-	6.72	6.58	6.99	6.91	7.50	7.28	6.95
pH (ALS Measurement)					6.54	6.73	6.55	6.93	7.02	6.86	7.02
pH (deionised water used in test)				-	6.11	5.85	6.88	6.80	6.43	6.57	6.14
EC (RGS Measurement) (µS/cm)		<1,000 #		3,580^	57	44	37	28	32	26	21
EC (ALS Measurement) (µS/cm)					59	45	41	29	27	23	22
Acidity (mg/L as $CaCO_3$)*		-		-	11	17	5	6	9	6	4
Hydroxide Alkalinity (mg/L as CaCO)*		-		-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*		-		-	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*		-		-	17	13	10	11	15	12	9
Total Alkalinity (mg/L as CaCO)*		-		-	17	13	10	11	15	12	9
Net Alkalinity (mg/L as CaCO)*		-		-	6	-4	5	5	6	6	5
Major Ions (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Calcium	Ca	1	-	1000	1	2	<1	<1	<1	<1	<1
Magnesium	Mg	1	-	-	<1	2	<1	<1	<1	<1	<1
Sodium	Na	1	-	-	17	15	10	7	6	6	5
Potassium	K	1	-	-	<1	1	<1	<1	<1	<1	<1
Chloride	Cl	1	-	-	5	<5	<1	<1	2	<1	<1
Fluoride	F [4]	0.1	-	2	0.5	0.3	0.3	0.4	0.3	0.4	0.4
Sulfate	SO	1	-	1000	44	26	4	4	<1	2	2
Total Organic Carbon	Org_C	1	-	-	23	17	13	10	10	8	6
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Aluminium	Al	0.01	0.055	5	1.33	1.53	1.3	0.92	0.9	0.77	0.65
Antimony	Sb	0.001	-	-	0.002	<0.001	0.001	0.001	0.002	0.001	0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	Ba	0.001	-	-	0.125	0.257	0.059	0.04	0.026	0.026	0.02
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	B	0.05	0.37	5	0.09	0.06	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	Cd	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	Cr	0.001	0.001 (hex)*	1	0.004	0.002	0.002	<0.001	0.001	0.001	0.001
Cobalt	Co	0.001	-	1	0.003	0.004	0.001	0.001	<0.001	<0.001	<0.001
Copper	Cu	0.001	0.0014	1	0.02	0.015	0.012	0.011	0.016	0.008	0.008
Iron	Fe	0.05	-	-	0.82	0.8	0.85	0.48	0.44	0.44	0.41
Lead	Pb	0.001	0.0034	0.1	0.002	0.004	0.002	0.002	0.001	0.001	<0.001
Manganese	Mn	0.001	1.9	-	0.041	0.072	0.02	0.014	0.009	0.008	0.006
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	<0.001	<0.001	0.001	0.001	<0.001	0.002	<0.001
Nickel	Ni	0.001	0.011	1	0.004	0.008	0.002	0.003	0.001	<0.001	<0.001
Selenium	Se	0.01	0.011	0.02	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	0.442	0.777	0.199	0.136	0.094	0.093	0.064
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	1.40	0.80	0.28	0.30	0.36	0.28	0.22
Total Cations	meq/L	0.01	-	-	1.01	0.94	0.43	0.30	0.26	0.26	0.22
Ionic Balance	%	0.01	-	-	----	----	----	----	----	----	----
Calculations**	**Elements**										
SO_4 Release Rate	SO [4]				6	5	1	1	0	0	0
Cumulative SO Release	Cum. SO				20	25	26	27	27	27	28
Ca Release Rate	Ca				0.1	0.4	0.1	0.1	0.1	0.1	0.1
Cumulative Ca Release	Cum. Ca				1.6	1.9	2.0	2.2	2.2	2.4	2.5
Mg Release Rate	Mg				2.3	2.9	2.0	1.5	1.0	1.4	1.1
Cumulative Mg Release	Cum. Mg				31.4	34.3	36.3	37.8	38.8	40.2	41.3
Residual ANC (%)	Res. ANC				83.7	82.1	81.1	80.3	79.8	79.0	78.4
[4] Residual Sulfur (%)	Res. S [4]				93.4	91.7	91.4	91.1	91.1	91.0	90.8
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)				0.6	0.4	0.1	0.1	0.0	0.1	0.1

Notes:

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KLC 2 Overburden: NAF - Barren (Free Leach)

Weight (kg)	4.00	Total S (%)	0.02	ANC	6.50	
pH (1:5)	8.51	Scr (%)	----	NAPP	-5.89	
EC (µS/cm)	257.00	MPA	0.61	ANC:MPA	10.61	

Date			17-Apr-25	15-May-25	11-Jun-25	09-Jul-25	07-Aug-25	03-Sep-25	02-Oct-25
Number of Weeks			0	4	8	12	16	20	24
Leach Number			1	2	3	4	5	6	7
ALS Laboratory Number			EB2513490002	EB2516624002	EB2520078002	EB2523737002	EB2527411002	EB2530773002	EB2534609002
Volume On (L)			2.2	1.5	1.0	1.2	1.0	1.0	1.0
Volume Off (L)			0.907	0.687	0.424	0.589	0.568	0.510	0.508
Cum. Volume (L)			0.91	1.59	2.02	2.61	3.17	3.68	4.19
pH (RGS Measurement)	6 to 9	-	9.24	8.25	8.34	8.66	8.85	8.71	8.65
pH (ALS Measurement)			7.59	7.5	8.09	7.99	8.43	8.49	7.86
pH (deionised water used in test)		-	7.05	5.45	6.41	7.02	5.86	6.63	5.83
EC (RGS Measurement) (µS/cm)	<1,000 #	3,580^	168	488	1,087	1,047	748	637	298
EC (ALS Measurement) (µS/cm)			191	510	1,080	766	686	614	316
Acidity (mg/L as $CaCO_3$)*	-	-	1	1	<1	1	<1	1	1
Hydroxide Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	8	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-	-	25	44	119	95	111	111	62
Total Alkalinity (mg/L as CaCO)*	-	-	25	44	119	95	111	120	62
Net Alkalinity (mg/L as CaCO)*	-	-	24	43	119	94	111	119	61

Major Ions (mg/L)	Elements	LoR	Aquatic Ecosystems (Freshwater)[1]	Livestock Drinking Water[2]						
Calcium	Ca	1	-	1000	<1	<1	<1	<1	<1	<1	<1
Magnesium	Mg	1	-	-	2	<1	<1	<1	<1	<1	<1
Sodium	Na	1	-	-	35	89	215	221	154	148	68
Potassium	K	1	-	-	2	1	3	3	2	2	1
Chloride	Cl	1	-	-	20	81	210	128	91	62	36
Fluoride	F [4]	0.1	-	2	2.4	6.4	15.5	10	10.5	9.7	4.7
Sulfate	SO	1	-	1000	12	37	123	71	46	47	27
Total Organic Carbon	Org_C	1	-	-	3	2	4	4	2	2	2
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**						
Aluminium	Al	0.01	0.055	5	11.40	0.35	0.28	0.29	0.68	0.98	0.84
Antimony	Sb	0.001	-	-	<0.001	0.003	0.008	0.011	0.011	0.01	0.006
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.005	0.006	0.014	0.017	0.015	0.018	0.01
Barium	Ba	0.001	-	-	0.032	0.003	0.007	0.006	0.004	0.006	0.012
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	B	0.05	0.37	5	<0.05	0.07	0.18	0.26	0.2	0.24	0.14
Cadmium	Cd	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	Cr	0.001	0.001 (hex)*	1	0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	0.091	0.004	<0.001	0.001	0.002	0.012	0.019
Copper	Cu	0.001	0.0014	1	0.040	0.004	0.003	0.003	0.005	0.009	0.011
Iron	Fe	0.05	-	-	6.85	0.21	0.2	0.19	0.39	0.61	0.34
Lead	Pb	0.001	0.0034	0.1	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Manganese	Mn	0.001	1.9	-	0.05	0.004	0.002	0.002	0.002	0.006	0.019
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	0.011	0.104	0.376	0.366	0.220	0.217	0.077
Nickel	Ni	0.001	0.011	1	0.007	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Selenium	Se	0.01	0.011	0.02	<0.01	<0.01	0.03	0.03	0.02	0.02	<0.01
Thorium	Th	0.001	-	-	0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001
Uranium	U	0.001	-	0.1	<0.001	<0.001	0.004	0.004	0.003	0.004	0.001
Vanadium	V	0.01	-	-	0.06	0.02	0.04	0.05	0.06	0.06	0.04
Zinc	Zn	0.005	0.008	-	0.033	<0.005	<0.005	<0.005	<0.005	0.006	0.018
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	1.31	3.93	10.90	7.51	5.74	5.63	2.82
Total Cations	meq/L	0.01	-	-	1.74	3.90	9.43	9.69	6.75	6.49	2.98
Ionic Balance	%	0.01	-	-	----	0.48	7.06	16.20	8.06	7.03	----

Calculations**	Elements								
SO_4 Release Rate	SO [4]		3	6	13	10	7	6	3
Cumulative SO Release	Cum. SO		3	9	22	33	39	45	48
Ca Release Rate	Ca		0.1	0.1	0.1	0.1	0.1	0.1	0.1
Cumulative Ca Release	Cum. Ca		0.1	0.2	0.3	0.3	0.4	0.5	0.5
Mg Release Rate	Mg		7.9	15.3	22.8	32.5	21.9	18.9	8.6
Cumulative Mg Release	Cum. Mg		7.9	23.2	46.0	78.5	100.3	119.2	127.8
Residual ANC (%)	Res. ANC		99.5	98.6	97.1	95.1	93.8	92.6	92.0
[4] Residual Sulfur (%)	Res. S		99.5	98.5	96.3	94.6	93.5	92.5	91.9
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)		0.1	0.1	0.1	0.1	0.1	0.1	0.1

Notes:

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KLC 2 Overburden: NAF - Barren (Free Leach)

Weight (kg)											
pH (1:5)											
EC (µS/cm)											
Date					17-Dec-25	21-Jan-26	18-Feb-26	18-Mar-26	15-Apr-26	13-May-26	10-Jun-26
Number of Weeks					35	40	44	48	52	56	60
Leach Number					8	9	10	11	12	13	14
ALS Laboratory Number					EB2545238002	EB2602305002	EB2606057002	EB2609975002	EB2613493002	EB2617014002	EB2621399002
Volume On (L)					1.0	1.5	1.0	1.2	1.2	1.5	1.0
Volume Off (L)					0.446	0.579	0.442	0.717	0.319	0.540	0.702
Cum. Volume (L)					4.64	5.22	5.66	6.38	6.70	7.24	7.94
pH (RGS Measurement)		6 to 9	-		9.28	9.07	8.91	8.99	9.00	9.01	9.02
pH (ALS Measurement)					8.32	8.41	8.47	8.72	8.45	8.60	8.52
pH (deionised water used in test)			-		6.11	5.85	6.88	6.80	6.43	6.57	6.14
EC (RGS Measurement) (µS/cm)		<1,000 #	3,580^		236	235	638	460	538	383	635
EC (ALS Measurement) (µS/cm)					257	226	609	429	566	366	464
Acidity (mg/L as $CaCO_3$)*		-	-		<1	<1	<1	<1	<1	<1	<1
Hydroxide Alkalinity (mg/L as CaCO)*		-	-		<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*		-	-		<1	<1	7	11	10	15	8
Bicarbonate Alkalinity (mg/L as CaCO)*		-	-		60	59	117	80	122	93	214
Total Alkalinity (mg/L as CaCO)*		-	-		60	59	124	92	131	109	222
Net Alkalinity (mg/L as CaCO)*		-	-		60	59	124	92	131	109	222
Major Ions (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Calcium	Ca	1	-	1000	1	2	<1	<1	<1	<1	<1
Magnesium	Mg	1	-	-	1	2	<1	<1	<1	<1	<1
Sodium	Na	1	-	-	55	53	130	91	122	83	82
Potassium	K	1	-	-	2	2	2	1	2	2	1
Chloride	Cl	1	-	-	21	16	47	32	39	21	14
Fluoride	F [4]	0.1	-	2	3.8	3.6	9.1	6	7.2	5.3	3.3
Sulfate	SO	1	-	1000	30	24	88	66	72	38	31
Total Organic Carbon	Org_C	1	-	-	2	2	2	3	3	<1	2
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Aluminium	Al	0.01	0.055	5	2.07	2.53	0.31	0.53	0.66	1.34	0.15
Antimony	Sb	0.001	-	-	0.011	0.008	0.023	0.016	0.041	0.031	0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.018	0.009	0.027	0.016	0.028	0.021	0.009
Barium	Ba	0.001	-	-	0.034	0.053	0.005	0.006	0.007	0.014	0.002
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	B	0.05	0.37	5	0.34	0.27	0.43	0.37	0.68	0.46	0.16
Cadmium	Cd	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	Cr	0.001	0.001 (hex)*	1	0.001	0.001	<0.001	<0.001	0.001	0.002	0.005
Cobalt	Co	0.001	-	1	0.09	0.092	0.003	0.009	0.012	0.026	0.003
Copper	Cu	0.001	0.0014	1	0.048	0.046	0.005	0.007	0.01	0.016	0.025
Iron	Fe	0.05	-	-	0.77	1.11	0.24	0.34	0.44	1.0	0.12
Lead	Pb	0.001	0.0034	0.1	0.001	0.003	<0.001	<0.001	0.001	0.002	<0.001
Manganese	Mn	0.001	1.9	-	0.028	0.06	0.003	0.007	0.008	0.017	0.003
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	0.035	0.008	0.179	0.1	0.113	0.051	0.063
Nickel	Ni	0.001	0.011	1	0.003	0.005	<0.001	<0.001	<0.001	0.002	<0.001
Selenium	Se	0.01	0.011	0.02	0.009	0.007	0.031	0.02	0.026	0.016	0.014
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	<0.001	0.001	0.003	0.002	0.002	0.002	0.001
Vanadium	V	0.01	-	-	0.09	0.08	0.1	0.07	0.1	0.09	0.03
Zinc	Zn	0.005	0.008	-	0.028	0.051	<0.005	0.005	0.01	0.017	<0.005
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	2.42	2.32	5.64	4.11	5.22	3.56	5.48
Total Cations	meq/L	0.01	-	-	2.58	2.62	5.71	3.98	5.36	3.66	3.59
Ionic Balance	%	0.01	-	-	----	----	0.62	1.62	1.34	1.39	20.8
Calculations**	**Elements**										
SO_4 Release Rate	SO [4]				3	3	10	12	6	5	5
Cumulative SO Release	Cum. SO				52	55	65	77	83	88	93
Ca Release Rate	Ca				0.1	0.3	0.1	0.1	0.0	0.1	0.1
Cumulative Ca Release	Cum. Ca				0.6	0.9	1.0	1.1	1.1	1.2	1.3
Mg Release Rate	Mg				6.1	7.7	14.3	16.3	9.7	11.2	14.4
Cumulative Mg Release	Cum. Mg				133.9	141.6	155.9	172.3	182.0	193.2	207.6
Residual ANC (%)	Res. ANC				91.7	91.2	90.3	89.3	88.7	88.0	87.1
Residual Sulfur (%) [4]	Res. S [4]				91.4	90.8	89.2	87.2	86.2	85.4	84.5
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)				0.1	0.1	0.2	0.2	0.1	0.1	0.1

Notes:

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< indicates less than the analytical detection limit. # for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm * Acidity and alkalinity data calculated in mg $CaCO_3$/L. Shaded cells exceed applied guideline values. (tri)* 0.024 g/L for trivalent Arsenic (III). (hex)* Cr (VI) = hexavalent. # for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm. ^ calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water. ** SO4, Ca and Mg release rates calculated in mg/kg/flush. Residual ANC assumes that all leached Mg and Ca is due to dissolution of calcite or dolomite. Total S = Total Sulfur; Scr = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity. MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential.

KLC 3 Waste Rock: NAF - Barren (Free Leach)

Weight (kg)	4.01	Total S (%)	0.01	ANC	11.40	
pH (1:5)	9.07	Scr (%)	----	NAPP	-11.09	
EC (µS/cm)	153.00	MPA	0.31	ANC:MPA	37.22	

Date			17-Apr-25	15-May-25	11-Jun-25	09-Jul-25	07-Aug-25	03-Sep-25	02-Oct-25
Number of Weeks			0	4	8	12	16	20	24
Leach Number			1	2	3	4	5	6	7
ALS Laboratory Number			EB2513490003	EB2516624003	EB2520078003	EB2523737003	EB2527411003	EB2530773003	EB2534609003
Volume On (L)			1.2	1.0	1.0	1.0	1.0	1.0	1.0
Volume Off (L)			0.549	0.612	0.565	0.624	0.637	0.868	0.756
Cum. Volume (L)			0.55	1.16	1.73	2.35	2.99	3.86	4.61
pH (RGS Measurement)	6 to 9	-	9.47	8.98	8.85	8.74	8.70	8.69	8.71
pH (ALS Measurement)			8.52	8.29	8.65	8.37	8.49	8.56	8.12
pH (deionised water used in test)		-	7.05	5.45	6.41	7.02	5.86	6.63	5.83
EC (RGS Measurement) (µS/cm)	<1,000 #	3,580^	461	360	271	289	267	272	214
EC (ALS Measurement) (µS/cm)			484	379	287	315	255	275	219
Acidity (mg/L as $CaCO_3$)*	-	-	<1	<1	<1	<1	<1	<1	1
Hydroxide Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-	-	<1	<1	13	<1	7	11	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-	-	101	107	104	110	98	94	83
Total Alkalinity (mg/L as CaCO)*	-	-	101	107	116	110	105	104	83
Net Alkalinity (mg/L as CaCO)*	-	-	101	107	116	110	105	104	82

Major Ions (mg/L)	Elements	LoR	Aquatic Ecosystems (Freshwater)[1]	Livestock Drinking Water[2]						
Calcium	Ca	1	-	1000	2	1	2	2	2	3	3
Magnesium	Mg	1	-	-	<1	<1	<1	<1	<1	<1	<1
Sodium	Na	1	-	-	92	75	56	64	57	61	43
Potassium	K	1	-	-	4	3	2	3	3	3	3
Chloride	Cl	1	-	-	8	3	1	<1	<1	<1	<1
Fluoride	F	0.1	-	2	4.0	3.6	1.9	1.8	1.2	1.2	1.0
Sulfate	SO	1	-	1000	101	73	33	44	27	33	26
Total Organic Carbon	Org_C	1	-	-	6	2	2	3	2	1	2
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**						
Aluminium	Al	0.01	0.055	5	0.60	0.17	0.56	0.20	0.42	0.3	0.41
Antimony	Sb	0.001	-	-	0.047	0.149	0.102	0.078	0.053	0.038	0.045
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.012	0.022	0.018	0.015	0.012	0.009	0.008
Barium	Ba	0.001	-	-	0.004	0.002	0.002	0.001	0.003	0.002	0.004
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	B	0.05	0.37	5	0.06	0.18	0.18	0.13	0.15	0.15	0.15
Cadmium	Cd	0.0001	0.0002	0.01	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Copper	Cu	0.001	0.0014	1	0.003	0.004	0.003	0.002	0.003	0.003	0.006
Iron	Fe	0.05	-	-	0.15	<0.05	0.11	<0.05	0.09	0.05	0.22
Lead	Pb	0.001	0.0034	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003
Manganese	Mn	0.001	1.9	-	0.004	0.001	0.001	<0.001	0.001	<0.001	0.004
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	0.081	0.044	0.021	0.028	0.03	0.043	0.05
Nickel	Ni	0.001	0.011	1	0.005	0.002	<0.001	<0.001	<0.001	<0.001	0.002
Selenium	Se	0.01	0.011	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	Th	0.001	-	-	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	0.001	0.002	0.001	0.001	0.001	0.001	<0.001
Vanadium	V	0.01	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	4.35	3.74	3.03	3.11	2.66	2.76	2.20
Total Cations	meq/L	0.01	-	-	4.20	3.39	2.71	2.96	2.66	2.88	2.10
Ionic Balance	%	0.01	-	-	1.67	4.96	5.57	2.53	----	----	----

Calculations**	Elements								
SO_4 Release Rate	SO 4	14	11	5	7	4	7	5
Cumulative SO Release	Cum. SO	14	25	30	36	41	48	53
Ca Release Rate	Ca	0.3	0.2	0.3	0.3	0.3	0.6	0.6
Cumulative Ca Release	Cum. Ca	0.3	0.4	0.7	1.0	1.3	2.0	2.6
Mg Release Rate	Mg	12.6	11.4	7.9	10.0	9.1	13.2	8.1
Cumulative Mg Release	Cum. Mg	12.6	24.0	31.9	41.9	50.9	64.1	72.2
Residual ANC (%)	Res. ANC	99.5	99.1	98.9	98.5	98.2	97.7	97.4
4 Residual Sulfur (%)	Res. S	95.4	91.7	90.1	87.8	86.4	84.0	82.4
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)	0.3	0.2	0.1	0.2	0.1	0.1	0.1

Notes:

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KLC 3 Waste Rock: NAF - Barren (Free Leach)

Weight (kg)												
pH (1:5)												
EC (µS/cm)												
Date					17-Dec-25	21-Jan-26	18-Feb-26	18-Mar-26	15-Apr-26	13-May-26	10-Jun-26
Number of Weeks					35	40	44	48	52	56	60
Leach Number					8	9	10	11	12	13	14
ALS Laboratory Number					EB2545238003	EB2602305003	EB2606057003	EB2609975003	EB2613493003	EB2617014003	EB2621399003
Volume On (L)					1.0	1.0	1.0	1.0	1.0	1.0	1.0
Volume Off (L)					0.377	0.579	0.838	0.762	0.701	0.723	0.748
Cum. Volume (L)					4.99	5.57	6.40	7.17	7.87	8.59	9.34
pH (RGS Measurement)	6 to 9		-		8.51	8.32	8.22	8.52	8.49	8.36	8.44
pH (ALS Measurement)					7.88	7.76	8.04	7.93	7.88	7.85	7.05
pH (deionised water used in test)			-		6.11	5.85	6.88	6.80	6.43	6.57	6.14
EC (RGS Measurement) (µS/cm)	<1,000 #		3,580^		216	228	233	188	157	169	133
EC (ALS Measurement) (µS/cm)					243	219	224	174	174	157	129
Acidity (mg/L as $CaCO_3$)*	-		-		3	2	<1	<1	1	1	1
Hydroxide Alkalinity (mg/L as CaCO)*	-		-		<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-		-		<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-		-		70	78	79	59	56	59	46
Total Alkalinity (mg/L as CaCO)*	-		-		70	78	79	59	56	59	46
Net Alkalinity (mg/L as CaCO)*	-		-		67	76	79	59	55	58	45
Major Ions (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Calcium	Ca	1	-	1000	5	5	5	5	5	7	7
Magnesium	Mg	1	-	-	1	1	1	1	1	1	1
Sodium	Na	1	-	-	45	41	39	31	26	24	18
Potassium	K	1	-	-	4	4	3	3	3	3	3
Chloride	Cl	1	-	-	<1	<1	<1	<1	1	<1	<1
Fluoride	F	0.1	-	2	0.8	0.8	0.7	0.6	0.6	0.5	0.4
Sulfate	SO	1	-	1000	45	30	35	28	25	23	17
Total Organic Carbon	Org_C	1	-	-	3	3	2	2	1	<1	<1
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Aluminium	Al	0.01	0.055	5	0.37	0.14	0.07	0.12	0.06	0.06	0.04
Antimony	Sb	0.001	-	-	0.056	0.049	0.038	0.035	0.039	0.035	0.022
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.007	0.005	0.004	0.003	0.003	0.003	0.002
Barium	Ba	0.001	-	-	0.003	0.003	0.003	0.003	0.002	0.002	0.002
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	B	0.05	0.37	5	0.4	0.33	0.24	0.22	0.2	0.17	0.13
Cadmium	Cd	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	Cu	0.001	0.0014	1	0.004	0.003	<0.001	0.002	<0.001	<0.001	<0.001
Iron	Fe	0.05	-	-	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead	Pb	0.001	0.0034	0.1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	Mn	0.001	1.9	-	0.005	0.004	0.003	0.002	0.002	0.002	0.002
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	0.055	0.03	0.029	0.035	0.039	0.032	0.032
Nickel	Ni	0.001	0.011	1	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	Se	0.01	0.011	0.02	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	0.013	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	2.34	2.18	2.31	1.76	1.67	1.66	1.27
Total Cations	meq/L	0.01	-	-	2.39	2.22	2.1	1.76	1.54	1.55	1.29
Ionic Balance	%	0.01	-	-	----	----	----	----	----	----	----
Calculations**	**Elements**										
SO_4 Release Rate	SO				4	4	7	5	4	4	3
Cumulative SO Release	Cum. SO				57	61	69	74	78	82	86
Ca Release Rate	Ca				0.5	0.7	1.0	0.9	0.9	1.3	1.3
Cumulative Ca Release	Cum. Ca				3.0	3.7	4.8	5.7	6.6	7.9	9.2
Mg Release Rate	Mg				4.2	5.9	8.1	5.9	4.5	4.3	3.4
Cumulative Mg Release	Cum. Mg				76.5	82.4	90.5	96.4	101.0	105.3	108.7
Residual ANC (%)	Res. ANC				97.2	97.0	96.7	96.5	96.3	96.1	96.0
Residual Sulfur (%)	Res. S				81.0	79.5	77.1	75.3	73.9	72.5	71.4
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)				0.2	0.2	0.2	0.2	0.2	0.2	0.2

Notes:

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KLC 4 Low Grade Ore: NAF - Barren/ PAF (Free Leach)

Weight (kg)	4.00	Total S (%)	0.28	ANC	13.70	
pH (1:5)	7.30	Scr (%)	----	NAPP	-5.13	
EC (µS/cm)	184.00	MPA	8.58	ANC:MPA	1.60	

Date			17-Apr-25	15-May-25	11-Jun-25	09-Jul-25	07-Aug-25	03-Sep-25	02-Oct-25
Number of Weeks			0	4	8	12	16	20	24
Leach Number			1	2	3	4	5	6	7
ALS Laboratory Number			EB2513490004	EB2516624004	EB2520078004	EB2523737004	EB2527411004	EB2530773004	EB2534609004
Volume On (L)			1.2	1.0	1.0	1.0	1.0	1.0	1.0
Volume Off (L)			0.796	0.575	0.574	0.616	0.655	0.805	0.684
Cum. Volume (L)			0.80	1.37	1.94	2.56	3.22	4.02	4.70
pH (RGS Measurement)	6 to 9	-	6.34	6.43	6.90	7.44	6.98	6.92	5.38
pH (ALS Measurement)			6.49	6.59	6.61	6.74	6.94	6.73	5.45
pH (deionised water used in test)		-	7.05	5.45	6.41	7.02	5.86	6.63	5.83
EC (RGS Measurement) (µS/cm)	<1,000 #	3,580^	949	323	245	223	235	260	414
EC (ALS Measurement) (µS/cm)			1,030	360	257	248	233	268	438
Acidity (mg/L as $CaCO_3$)*	-	-	15	2	3	2	2	3	15
Hydroxide Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-	-	30	7	6	9	10	7	2
Total Alkalinity (mg/L as CaCO)*	-	-	30	7	6	9	10	7	2
Net Alkalinity (mg/L as CaCO)*	-	-	15	5	3	7	8	4	-13

Major Ions (mg/L)	Elements	LoR	Aquatic Ecosystems (Freshwater)[1]	Livestock Drinking Water[2]						
Calcium	Ca	1	-	1000	106	33	27	26	22	24	64
Magnesium	Mg	1	-	-	12	4	3	2	2	3	5
Sodium	Na	1	-	-	72	19	13	18	21	22	12
Potassium	K	1	-	-	5	2	1	1	1	1	1
Chloride	Cl	1	-	-	7	<1	<1	<1	<1	<1	<1
Fluoride	F [4]	0.1	-	2	2.0	2.0	1.4	1.5	1.3	1.2	1.9
Sulfate	SO	1	-	1000	413	142	105	88	93	113	215
Total Organic Carbon	Org_C	1	-	-	8	1	<1	<1	<1	<1	<1
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**						
Aluminium	Al	0.01	0.055	5	0.22	0.04	0.04	0.02	0.02	0.03	1.04
Antimony	Sb	0.001	-	-	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.001	0.004	0.002	0.003	0.003	0.002	0.001
Barium	Ba	0.001	-	-	0.056	0.013	0.01	0.007	0.006	0.007	0.023
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Boron	B	0.05	0.37	5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	Cd	0.0001	0.0002	0.01	0.0032	0.0007	0.0008	0.0003	0.0003	0.0007	0.0054
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	1.400	0.109	0.117	0.041	0.026	0.062	0.329
Copper	Cu	0.001	0.0014	1	0.004	0.008	0.013	0.006	0.004	0.008	0.248
Iron	Fe	0.05	-	-	0.26	<0.05	<0.05	<0.05	<0.05	<0.05	1.25
Lead	Pb	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Manganese	Mn	0.001	1.9	-	3.280	0.533	0.564	0.405	0.323	0.511	1.97
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001
Nickel	Ni	0.001	0.011	1	1.560	0.090	0.107	0.032	0.019	0.049	0.26
Selenium	Se	0.01	0.011	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	0.536	0.093	0.172	0.052	0.033	0.13	1.07
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	9.40	3.10	2.31	2.09	2.14	2.49	4.52
Total Cations	meq/L	0.01	-	-	9.54	2.85	2.18	2.27	2.20	2.43	4.15
Ionic Balance	%	0.01	-	-	0.74	4.08	----	----	----	----	4.19

Calculations**	Elements								
SO_4 Release Rate	SO [4]	82	20	15	14	15	23	37
Cumulative SO Release	Cum. SO	82	103	118	131	146	169	206
Ca Release Rate	Ca	21.1	4.7	3.9	4.0	3.6	4.8	10.9
Cumulative Ca Release	Cum. Ca	21.1	25.8	29.7	33.7	37.3	42.1	53.1
Mg Release Rate	Mg	14.3	2.7	1.9	2.8	3.4	4.4	2.1
Cumulative Mg Release	Cum. Mg	14.3	17.0	18.9	21.7	25.1	29.5	31.6
Residual ANC (%)	Res. ANC	99.2	99.0	98.9	98.8	98.6	98.4	98.1
[4] Residual Sulfur (%)	Res. S	99.0	98.8	98.6	98.4	98.3	98.0	97.5
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)	0.8	0.9	0.9	0.7	0.7	0.8	1.1

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KLC 4 Low Grade Ore: NAF - Barren/ PAF (Free Leach)

Weight (kg)											
pH (1:5)											
EC (µS/cm)											
Date					17-Dec-25	21-Jan-26	18-Feb-26	18-Mar-26	15-Apr-26	13-May-26	10-Jun-26
Number of Weeks					35	40	44	48	52	56	60
Leach Number					8	9	10	11	12	13	14
ALS Laboratory Number					EB2545238004	EB2602305004	EB2606057004	EB2609975004	EB2613493004	EB2617014004	EB2621399004
Volume On (L)					1.0	1.0	1.0	1.0	1.0	1.0	1.0
Volume Off (L)					0.530	0.570	0.843	0.759	0.788	0.795	0.819
Cum. Volume (L)					5.23	5.80	6.65	7.41	8.19	8.99	9.81
pH (RGS Measurement)		6 to 9	-		4.73	5.45	5.73	4.74	4.70	4.69	4.65
pH (ALS Measurement)					3.84	5.21	5.89	4.62	4.51	4.55	5.01
pH (deionised water used in test)			-		6.11	5.85	6.88	6.80	6.43	6.57	6.14
EC (RGS Measurement) (µS/cm)		<1,000 #	3,580^		454	316	213	369	350	368	306
EC (ALS Measurement) (µS/cm)					549	314	205	373	389	358	316
Acidity (mg/L as $CaCO_3$)*		-	-		42	11	5	22	20	20	18
Hydroxide Alkalinity (mg/L as CaCO)*		-	-		<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*		-	-		<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*		-	-		<1	<1	2	2	<1	3	<1
Total Alkalinity (mg/L as CaCO)*		-	-		<1	<1	2	2	<1	3	<1
Net Alkalinity (mg/L as CaCO)*		-	-		-42	-11	-3	-20	-20	-17	-18
Major Ions (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Calcium	Ca	1	-	1000	77	48	26	50	52	50	44
Magnesium	Mg	1	-	-	6	4	2	4	5	5	4
Sodium	Na	1	-	-	5	6	4	5	4	6	4
Potassium	K	1	-	-	2	1	<1	1	1	<1	<1
Chloride	Cl	1	-	-	<1	<1	<1	<1	1	<1	<1
Fluoride	F [4]	0.1	-	2	3.2	1.8	1.2	2.3	2.1	2.4	1.9
Sulfate	SO	1	-	1000	241	147	89	177	174	176	143
Total Organic Carbon	Org_C	1	-	-	1	<1	<1	<1	<1	<1	<1
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Aluminium	Al	0.01	0.055	5	2.69	0.88	0.4	2.07	2.02	2.27	2.05
Antimony	Sb	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.003	0.002	0.001	0.003	0.002	0.002	0.002
Barium	Ba	0.001	-	-	0.036	0.015	0.008	0.02	0.02	0.019	0.016
Beryllium	Be	0.001	-	-	0.003	0.001	<0.001	0.002	0.002	0.002	0.002
Boron	B	0.05	0.37	5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	Cd	0.0001	0.0002	0.01	0.0093	0.0034	0.0017	0.0068	0.0066	0.0069	0.006
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	0.476	0.175	0.078	0.207	0.221	0.224	0.184
Copper	Cu	0.001	0.0014	1	0.608	0.175	0.052	0.481	0.444	0.428	0.394
Iron	Fe	0.05	-	-	5.59	0.52	0.07	2.6	2.22	1.9	1.73
Lead	Pb	0.001	0.0034	0.1	0.019	0.005	<0.001	0.017	0.017	0.018	0.018
Manganese	Mn	0.001	1.9	-	2.69	1.58	0.921	1.87	1.9	2.04	1.68
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001
Nickel	Ni	0.001	0.011	1	0.479	0.164	0.075	0.221	0.238	0.255	0.217
Selenium	Se	0.01	0.011	0.02	0.004	<0.004	<0.004	<0.004	0.004	<0.004	<0.004
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	0.004	0.001	<0.001	0.003	0.003	0.003	0.003
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	1.72	0.522	0.235	1.01	0.928	0.966	0.807
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	5.02	3.06	1.89	3.73	3.65	3.85	2.98
Total Cations	meq/L	0.01	-	-	4.6	3.01	1.75	3.53	3.63	3.61	2.93
Ionic Balance	%	0.01	-	-	4.29	0.82	----	2.75	0.29	3.17	----
Calculations**	**Elements**										
SO_4 Release Rate	SO [4]				32	21	19	34	34	35	29
Cumulative SO Release	Cum. SO				238	259	277	311	345	380	409
Ca Release Rate	Ca				10.2	6.8	5.5	9.5	10.2	9.9	9.0
Cumulative Ca Release	Cum. Ca				63.3	70.1	75.6	85.0	95.3	105.2	114.2
Mg Release Rate	Mg				0.7	0.9	0.8	0.9	0.8	1.2	0.8
Cumulative Mg Release	Cum. Mg				32.3	33.1	34.0	34.9	35.7	36.9	37.7
Residual ANC (%)	Res. ANC				97.9	97.8	97.7	97.5	97.2	97.0	96.9
[4] Residual Sulfur (%)	Res. S [4]				97.2	96.9	96.7	96.3	95.9	95.5	95.1
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)				1.2	1.1	1.1	1.3	1.2	1.2	1.2

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KLC 5 Orebody: NAF/ PAF (Free Leach)

Weight (kg)	4.00	Total S (%)	1.27	ANC	11.40	
pH (1:5)	7.57	Scr (%)	----	NAPP	27.49	
EC (µS/cm)	182.00	MPA	38.89	ANC:MPA	0.29	

Date			17-Apr-25	15-May-25	11-Jun-25	09-Jul-25	07-Aug-25	03-Sep-25	02-Oct-25
Number of Weeks			0	4	8	12	16	20	24
Leach Number			1	2	3	4	5	6	7
ALS Laboratory Number			EB2513490005	EB2516624005	EB2520078005	EB2523737005	EB2527411005	EB2530773005	EB2534609005
Volume On (L)			1.2	1.0	1.0	1.0	1.0	1.0	1.0
Volume Off (L)			0.731	0.695	0.625	0.614	0.638	0.686	0.630
Cum. Volume (L)			0.73	1.43	2.05	2.67	3.30	3.99	4.62
pH (RGS Measurement)	6 to 9	-	5.87	5.29	5.36	5.58	5.37	4.78	4.35
pH (ALS Measurement)			5.81	5.59	5.46	5.48	5.22	4.94	4.63
pH (deionised water used in test)		-	7.05	5.45	6.41	7.02	5.86	6.63	5.83
EC (RGS Measurement) (µS/cm)	<1,000 #	3,580^	879	435	286	229	288	268	259
EC (ALS Measurement) (µS/cm)			974	470	293	245	208	273	284
Acidity (mg/L as $CaCO_3$)*	-	-	50	9	9	9	9	14	18
Hydroxide Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-	-	5	1	2	2	2	<1	3
Total Alkalinity (mg/L as CaCO)*	-	-	5	1	2	2	2	<1	3
Net Alkalinity (mg/L as CaCO)*	-	-	-45	-8	-7	-7	-7	-13.5	-15.0

Major Ions (mg/L)	Elements	LoR	Aquatic Ecosystems (Freshwater)[1]	Livestock Drinking Water[2]						
Calcium	Ca	1	-	1000	81	39	25	23	18	21	25
Magnesium	Mg	1	-	-	11	6	4	4	4	5	5
Sodium	Na	1	-	-	69	31	19	17	14	20	13
Potassium	K	1	-	-	6	3	2	2	2	2	1
Chloride	Cl	1	-	-	9	3	<1	<1	<5	<1	<1
Fluoride	F^4	0.1	-	2	3.2	2.5	1.8	1.7	1.4	1.5	1.5
Sulfate	SO	1	-	1000	374	200	129	101	89	125	111
Total Organic Carbon	Org_C	1	-	-	5	<1	<1	<1	<1	<1	<1

Trace metals/ metalloids (mg/L)	Elements	LoR	Aquatic Ecosystems (Freshwater)[1]	Livestock Drinking Water[2]						
Aluminium	Al	0.01	0.055	5	1.27	0.6	0.57	0.62	0.68	0.94	1.31
Antimony	Sb	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.001	0.002	<0.001	<0.001	<0.001	<0.001	0.001
Barium	Ba	0.001	-	-	0.061	0.02	0.013	0.012	0.014	0.02	0.021
Beryllium	Be	0.001	-	-	0.002	0.001	<0.001	<0.001	<0.001	0.002	0.002
Boron	B	0.05	0.37	5	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	Cd	0.0001	0.0002	0.01	0.001	0.0007	0.0002	0.0002	0.0003	0.0005	0.0007
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	0.365	0.092	0.054	0.048	0.041	0.055	0.057
Copper	Cu	0.001	0.0014	1	<0.001	0.004	0.009	0.016	0.051	0.1	0.102
Iron	Fe	0.05	-	-	17.4	1.64	1.18	1.24	1.51	2.77	2.46
Lead	Pb	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	0.011
Manganese	Mn	0.001	1.9	-	2.56	0.831	0.508	0.481	0.407	0.574	0.62
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001
Nickel	Ni	0.001	0.011	1	0.821	0.196	0.112	0.103	0.094	0.131	0.138
Selenium	Se	0.01	0.011	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	0.002	<0.001	<0.001	<0.001	0.001	0.002	0.003
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	0.204	0.095	0.073	0.078	0.088	0.137	0.169
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	8.14	4.27	2.72	2.14	1.89	2.60	2.37
Total Cations	meq/L	0.01	-	-	8.10	3.86	2.45	2.27	1.89	2.38	2.25
Ionic Balance	%	0.01	-	-	0.24	4.96	----	----	----	----	----

Calculations**	Elements									
SO_4 Release Rate	SO_4		68	35	20	16	14	21	17
Cumulative SO Release	Cum. SO		68	103	123	139	153	174	192
Ca Release Rate	Ca		14.8	6.8	3.9	3.5	2.9	3.6	3.9
Cumulative Ca Release	Cum. Ca		14.8	21.6	25.5	29.0	31.9	35.5	39.4
Mg Release Rate	Mg		12.6	5.4	3.0	2.6	2.2	3.4	2.0
Cumulative Mg Release	Cum. Mg		12.6	18.0	21.0	23.6	25.8	29.2	31.3
Residual ANC (%)	Res. ANC		99.2	98.9	98.7	98.5	98.4	98.2	98.0
Residual Sulfur (%)	Res. S_4		99.8	99.7	99.7	99.6	99.6	99.5	99.5
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)		0.8	0.9	1.0	0.8	0.9	1.0	1.0

Notes:

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< indicates less than the analytical detection limit. # for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm * Acidity and alkalinity data calculated in mg $CaCO_3$/L. Shaded cells exceed applied guideline values. (tri)* 0.024 g/L for trivalent Arsenic (III). (hex)* Cr (VI) = hexavalent. # for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm. ^ calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water. ** SO4, Ca and Mg release rates calculated in mg/kg/flush. Residual ANC assumes that all leached Mg and Ca is due to dissolution of calcite or dolomite. Total S = Total Sulfur; Scr = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity. MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential.

KLC 5 Orebody: NAF/ PAF (Free Leach)

Weight (kg)										
pH (1:5)										
EC (µS/cm)										
Date				17-Dec-25	21-Jan-26	18-Feb-26	18-Mar-26	15-Apr-26	13-May-26	10-Jun-26
Number of Weeks				35	40	44	48	52	56	60
Leach Number				8	9	10	11	12	13	14
ALS Laboratory Number				EB2545238005	EB2602305005	EB2606057005	EB2609975005	EB2613493005	EB2617014005	EB2621399005
Volume On (L)				1.0	1.0	1.0	1.0	1.0	1.0	1.0
Volume Off (L)				0.556	0.580	0.865	0.805	0.797	0.798	0.811
Cum. Volume (L)				5.17	5.76	6.62	7.43	8.22	9.02	9.83
pH (RGS Measurement)			-	3.85	3.86	3.86	3.65	3.63	3.53	3.53
pH (ALS Measurement)	6 to 9			3.77	3.81	3.89	3.57	3.57	3.51	3.77
pH (deionised water used in test)			-	6.11	5.85	6.88	6.80	6.43	6.57	6.14
EC (RGS Measurement) (µS/cm)	<1,000 #		3,580^	757	497	374	626	668	658	554
EC (ALS Measurement) (µS/cm)				826	499	372	630	772	705	540
Acidity (mg/L as $CaCO_3$)*	-		-	195	51	38	108	148	120	82
Hydroxide Alkalinity (mg/L as CaCO)*	-		-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-		-	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-		-	<1	<1	<1	<1	<1	<1	<1
Total Alkalinity (mg/L as CaCO)*	-		-	<1	<1	<1	<1	<1	<1	<1
Net Alkalinity (mg/L as CaCO)*	-		-	-195	-51	-38	-108	-148	-120	-82
Major Ions (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**						
Calcium	Ca	1	-	1000	83	53	33	55	57	57	47
Magnesium	Mg	1	-	-	11	8	7	9	10	12	9
Sodium	Na	1	-	-	8	9	6	5	4	5	3
Potassium	K	1	-	-	3	2	1	1	1	1	<1
Chloride	Cl	1	-	-	<1	<1	<1	<1	1	<1	<1
Fluoride	F	0.1	-	2	6.0	2.5	1.8	3.7	3.9	4	3.4
Sulfate	SO	1	-	1000	430	224	158	291	327	323	240
Total Organic Carbon	Org_C	1	-	-	1	<1	<1	<1	<1	<1	<1
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**						
Aluminium	Al	0.01	0.055	5	10	2.95	2.42	6.04	8.13	7.96	5.75
Antimony	Sb	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.01	0.003	0.002	0.006	0.008	0.007	0.005
Barium	Ba	0.001	-	-	0.057	0.022	0.016	0.025	0.025	0.023	0.018
Beryllium	Be	0.001	-	-	0.012	0.004	0.003	0.007	0.009	0.01	0.007
Boron	B	0.05	0.37	5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	Cd	0.0001	0.0002	0.01	0.0043	0.0015	0.0011	0.0023	0.0028	0.0027	0.0021
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	0.562	0.22	0.156	0.279	0.407	0.41	0.315
Copper	Cu	0.001	0.0014	1	0.2	0.055	0.093	0.37	0.34	0.372	0.386
Iron	Fe	0.05	-	-	73.5	9.79	3.32	24.8	41.8	31.6	19
Lead	Pb	0.001	0.0034	0.1	0.025	0.011	0.01	0.017	0.019	0.02	0.016
Manganese	Mn	0.001	1.9	-	3.11	2.5	2.1	2.37	2.74	3.28	2.71
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	Ni	0.001	0.011	1	1.37	0.561	0.424	0.714	1.12	1.11	0.842
Selenium	Se	0.01	0.011	0.02	0.007	<0.004	<0.004	0.005	0.008	0.006	0.005
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Uranium	U	0.001	-	0.1	0.025	0.004	0.003	0.013	0.018	0.019	0.014
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	0.957	0.33	0.24	0.515	0.636	0.674	0.586
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	8.95	4.66	3.29	6.06	6.84	6.94	5
Total Cations	meq/L	0.01	-	-	9.41	4.79	3.11	5.46	6.44	6.29	5.08
Ionic Balance	%	0.01	-	-	2.49	1.38	2.81	5.20	3.01	4.92	0.79
Calculations**	**Elements**										
SO_4 Release Rate	SO				60	32	34	59	65	64	49
Cumulative SO Release	Cum. SO				252	284	318	377	442	507	555
Ca Release Rate	Ca				11.5	7.7	7.1	11.1	11.4	11.4	9.5
Cumulative Ca Release	Cum. Ca				51.0	58.7	65.8	76.9	88.2	99.6	109.1
Mg Release Rate	Mg				1.1	1.3	1.3	1.0	0.8	1.0	0.6
Cumulative Mg Release	Cum. Mg				32.4	33.7	35.0	36.0	36.8	37.8	38.4
Residual ANC (%)	Res. ANC				97.8	97.5	97.3	97.1	96.8	96.5	96.3
Residual Sulfur (%)	Res. S				99.3	99.3	99.2	99.0	98.8	98.7	98.5
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)				1.9	1.4	1.5	1.9	2.1	2.1	1.9

Notes:

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KLC 6 Tailings: PAF (Free Leach)

Weight (kg)	3.01	Total S (%)	1.92	ANC	14.80	
pH (1:5)	8.26	Scr (%)	1.40	NAPP	28.17	
EC (µS/cm)	374.00	MPA	42.97	ANC:MPA	0.34	

Date			17-Apr-25	15-May-25	11-Jun-25	09-Jul-25	07-Aug-25	03-Sep-25	02-Oct-25
Number of Weeks			0	4	8	12	16	20	24
Leach Number			1	2	3	4	5	6	7
ALS Laboratory Number			EB2513490006	EB2516624006	EB2520078006	EB2523737006	EB2527411006	EB2530773006	EB2534609006
Volume On (L)			2.2	1.0	1.0	1.2	1.0	1.0	1.2
Volume Off (L)			0.993	0.376	0.597	0.547	0.546	0.640	0.827
Cum. Volume (L)			0.99	1.37	1.97	2.51	3.06	3.70	4.53
pH (RGS Measurement)	6 to 9	-	6.67	6.44	7.24	6.78	5.46	4.57	3.72
pH (ALS Measurement)			6.28	6.45	7.29	6.82	4.90	4.65	3.70
pH (deionised water used in test)		-	7.05	5.45	6.41	7.02	5.86	6.63	5.83
EC (RGS Measurement) (µS/cm)	<1,000 #	3,580^	2,480	1,737	1,744	1,840	1,933	2,900	3,460
EC (ALS Measurement) (µS/cm)			2,950	1,910	2,180	1,990	1,900	3,300	4,080
Acidity (mg/L as $CaCO_3$)*	-	-	9	4	5	5	78	475	1400
Hydroxide Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-	-	13	12	38	17	<1	3	<1
Total Alkalinity (mg/L as CaCO)*	-	-	13	12	38	17	<1	3	<1
Net Alkalinity (mg/L as CaCO)*	-	-	4.0	8.0	33.0	12.0	-77.5	-472.0	-1399.5

Major Ions (mg/L)	Elements	LoR	Aquatic Ecosystems (Freshwater)[1]	Livestock Drinking Water[2]						
Calcium	Ca	1	-	1000	470	330	356	409	378	470	433
Magnesium	Mg	1	-	-	67	27	27	32	44	84	104
Sodium	Na	1	-	-	63	18	16	17	20	33	31
Potassium	K	1	-	-	52	22	18	23	27	50	54
Chloride	Cl	1	-	-	507	16	3	2	20	320	540
Fluoride	F	0.1	-	2	1.8	2.3	1.5	1.5	2.4	3.8	3.7
Sulfate	SO	1	-	1000	754	940	1,220	1,230	649	1,920	2,410
Total Organic Carbon	Org_C	1	-	-	12	3	3	2	1	2	5
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**						
Aluminium	Al	0.01	0.055	5	0.01	0.13	<0.01	<0.01	0.94	5.57	48.2
Antimony	Sb	0.001	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.002	0.003	<0.001	<0.001	<0.001	0.003	0.012
Barium	Ba	0.001	-	-	0.073	0.101	0.09	0.076	0.085	0.052	0.041
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	0.027
Boron	B	0.05	0.37	5	0.44	0.73	0.33	0.22	0.28	0.39	0.5
Cadmium	Cd	0.0001	0.0002	0.01	0.0002	0.0004	0.0001	0.0002	0.0013	0.0077	0.0303
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Cobalt	Co	0.001	-	1	0.002	0.013	0.007	0.025	0.592	3.88	9.78
Copper	Cu	0.001	0.0014	1	0.003	0.03	<0.001	<0.001	0.002	0.008	0.035
Iron	Fe	0.05	-	-	<0.05	<0.05	<0.05	<0.05	31.4	245	429
Lead	Pb	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.03
Manganese	Mn	0.001	1.9	-	1.150	2.130	3.960	7.350	18.700	52.1	73.3
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	0.012	0.003	0.002	<0.001	0.005	<0.001	<0.001
Nickel	Ni	0.001	0.011	1	0.006	0.024	0.025	0.087	1.36	8.89	22.6
Selenium	Se	0.01	0.011	0.02	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Uranium	U	0.001	-	0.1	0.005	0.002	0.001	<0.001	<0.001	0.005	0.053
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	0.032	0.112	0.016	0.022	0.26	0.947	3.5
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	30.30	20.30	26.20	26.00	14.10	49.10	65.40
Total Cations	meq/L	0.01	-	-	33.00	20.00	21.40	24.40	24.00	44.80	57.30
Ionic Balance	%	0.01	-	-	4.39	0.56	10.10	3.24	26.10	4.72	6.60

Calculations**	Elements									
SO_4 Release Rate	SO		249	118	242	224	118	409	663
Cumulative SO Release	Cum. SO		249	367	609	833	951	1360	2023
Ca Release Rate	Ca		155.2	41.3	70.8	74.5	68.7	100.1	119.2
Cumulative Ca Release	Cum. Ca		155.2	196.5	267.3	341.8	410.4	510.5	629.7
Mg Release Rate	Mg		20.8	2.3	3.2	3.1	3.6	7.0	8.5
Cumulative Mg Release	Cum. Mg		20.8	23.1	26.2	29.3	33.0	40.0	48.5
Residual ANC (%)	Res. ANC		96.9	96.1	94.9	93.6	92.3	90.5	88.3
Residual Sulfur (%)	Res. S		99.6	99.4	98.9	98.6	98.3	97.6	96.5
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)		0.5	1.1	1.3	1.2	0.7	1.5	2.1

Notes:

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KLC 6 Tailings: PAF (Free Leach)

Weight (kg)											
pH (1:5)											
EC (µS/cm)											
Date					17-Dec-25	21-Jan-26	18-Feb-26	18-Mar-26	15-Apr-26	13-May-26	10-Jun-26
Number of Weeks					35	40	44	48	52	56	60
Leach Number					8	9	10	11	12	13	14
ALS Laboratory Number					EB2545238006	EB2602305006	EB2606057006	EB2609975006	EB2613493006	EB2617014006	EB2621399006
Volume On (L)					2.0	1.6	1.5	1.5	1.2	1.2	1.5
Volume Off (L)					0.841	0.730	0.821	0.860	0.520	0.810	0.681
Cum. Volume (L)					5.37	6.10	6.92	7.78	8.30	9.11	9.79
pH (RGS Measurement)	6 to 9		-		3.24	3.03	3.02	2.95	2.85	2.75	2.83
pH (ALS Measurement)					3.33	3.02	3.07	2.95	2.79	2.78	2.77
pH (deionised water used in test)			-		6.11	5.85	6.88	6.80	6.43	6.57	6.14
EC (RGS Measurement) (µS/cm)	<1,000 #		3,580^		5,040	4,140	3,450	3,560	3,660	3,770	3,400
EC (ALS Measurement) (µS/cm)					5,320	4,360	3,750	3,910	4,400	4,080	3,640
Acidity (mg/L as $CaCO_3$)*	-		-		2,600	1,980	1,520	1,480	1,950	1,820	1,560
Hydroxide Alkalinity (mg/L as CaCO)*	-		-		<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-		-		<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-		-		<1	<1	<1	<1	<1	<1	<1
Total Alkalinity (mg/L as CaCO)*	-		-		<1	<1	<1	<1	<1	<1	<1
Net Alkalinity (mg/L as CaCO)*	-		-		-2600	-1980	-1520	-1480	-1950	-1820	-1560
Major Ions (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Calcium	Ca	1	-	1000	378	529	419	425	458	423	438
Magnesium	Mg	1	-	-	126	111	61	44	48	41	28
Sodium	Na	1	-	-	22	18	9	6	6	5	4
Potassium	K	1	-	-	49	41	24	17	14	12	10
Chloride	Cl	1	-	-	38	329	115	65	54	49	33
Fluoride	F[4]	0.1	-	2	4.4	3.8	2.7	2.2	0.9	0.7	15.2
Sulfate	SO	1	-	1000	3,710	3,050	2,470	2,540	2,700	3,210	2,760
Total Organic Carbon	Org_C	1	-	-	9	6	3	3	3	2	2
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Aluminium	Al	0.01	0.055	5	192	312	195	170	226	242	212
Antimony	Sb	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.039	0.055	0.05	0.058	0.1	0.079	0.066
Barium	Ba	0.001	-	-	0.027	0.021	0.02	0.018	0.017	0.014	0.017
Beryllium	Be	0.001	-	-	0.096	0.159	0.133	0.131	0.146	0.12	0.077
Boron	B	0.05	0.37	5	0.45	0.74	0.48	0.37	0.42	0.27	0.18
Cadmium	Cd	0.0001	0.0002	0.01	0.102	0.192	0.16	0.15	0.152	0.118	0.0809
Chromium	Cr	0.001	0.001 (hex)*	1	0.013	0.018	0.014	0.019	0.045	0.047	0.047
Cobalt	Co	0.001	-	1	14.2	11.3	6.35	4.56	4.88	4.25	2.88
Copper	Cu	0.001	0.0014	1	0.873	3.1	3.84	4.98	7.09	6.54	5.72
Iron	Fe	0.05	-	-	188	54.3	54.1	65.1	49	91.9	48.5
Lead	Pb	0.001	0.0034	0.1	0.096	0.163	0.152	0.186	0.237	0.248	0.242
Manganese	Mn	0.001	1.9	-	83.4	61.7	30.3	16.1	12.6	9.33	5.67
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	Ni	0.001	0.011	1	34.3	27.8	15.6	10.4	10.5	8.99	6.06
Selenium	Se	0.01	0.011	0.02	0.044	0.068	0.063	0.068	0.109	0.07	0.063
Thorium	Th	0.001	-	-	0.01	0.021	0.014	0.017	0.034	0.041	0.03
Uranium	U	0.001	-	0.1	0.447	0.808	0.697	0.617	0.516	0.401	0.262
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	18	51.1	42.4	36.3	37.4	30.1	19.1
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	78.3	72.8	54.7	54.7	57.7	68.2	58.4
Total Cations	meq/L	0.01	-	-	64.4	78.8	53.9	58.9	56.6	57.1	50.8
Ionic Balance	%	0.01	-	-	9.72	3.96	0.74	3.7	0.98	8.93	6.96
Calculations**	**Elements**										
SO_4 Release Rate	SO[4]				1038	741	675	726	467	865	626
Cumulative SO Release	Cum. SO				3061	3802	4477	5204	5671	6536	7161
Ca Release Rate	Ca				105.8	128.4	114.5	121.6	79.3	114.0	99.3
Cumulative Ca Release	Cum. Ca				735.5	863.9	978.4	1100.0	1179.2	1293.2	1392.5
Mg Release Rate	Mg				6.2	4.4	2.5	1.7	1.0	1.3	0.9
Cumulative Mg Release	Cum. Mg				54.7	59.1	61.5	63.2	64.3	65.6	66.5
Residual ANC (%)	Res. ANC				86.4	84.1	82.1	80.1	78.8	76.8	75.2
Residual Sulfur (%)	Res. S				94.7	93.4	92.2	91.0	90.1	88.6	87.6
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)				3.7	2.3	2.4	2.4	2.4	3.1	2.6

Notes:

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< indicates less than the analytical detection limit. # for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm * Acidity and alkalinity data calculated in mg $CaCO_3$/L. Shaded cells exceed applied guideline values. (tri)* 0.024 g/L for trivalent Arsenic (III). (hex)* Cr (VI) = hexavalent. # for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm. ^ calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water. ** SO4, Ca and Mg release rates calculated in mg/kg/flush. Residual ANC assumes that all leached Mg and Ca is due to dissolution of calcite or dolomite. Total S = Total Sulfur; Scr = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity. MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential.

KLC 7 Tailings: PAF (Saturated)

Weight (kg)	3.00	Total S (%)	1.92	ANC	14.80	
pH (1:5)	8.26	Scr (%)	1.40	NAPP	28.17	
EC (µS/cm)	374.00	MPA	42.97	ANC:MPA	0.34	

Date			17-Apr-25	15-May-25	11-Jun-25	09-Jul-25	07-Aug-25	03-Sep-25	02-Oct-25
Number of Weeks			0	4	8	12	16	20	24
Leach Number			1	2	3	4	5	6	7
ALS Laboratory Number			EB2513490007	EB2516624007	EB2520078007	EB2523737007	EB2527411007	EB2530773007	EB2534609007
Volume On (L)			1.0	0.9	1.0	1.1	1.0	1.0	1.0
Volume Off (L)			1.011	0.837	0.975	0.969	0.950	0.952	0.943
Cum. Volume (L)			1.01	1.85	2.82	3.79	4.74	5.69	6.64
pH (RGS Measurement)	6 to 9	-	6.96	7.02	7.27	7.39	7.50	7.39	7.32
pH (ALS Measurement)			7.00	7.70	7.56	7.56	7.62	7.71	7.35
pH (deionised water used in test)		-	6.62	5.45	7.84	6.44	6.75	6.63	5.83
EC (RGS Measurement) (µS/cm)	<1,000 #	3,580^	2,690	1,645	753	527	494	489	459
EC (ALS Measurement) (µS/cm)			3,240	1,740	755	559	488	492	517
Acidity (mg/L as $CaCO_3$)*	-	-	10	5	4	3	4	3	9.0
Hydroxide Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-	-	<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-	-	68	87	108	90	87	85	77
Total Alkalinity (mg/L as CaCO)*	-	-	68	87	108	90	87	85	77
Net Alkalinity (mg/L as CaCO)*	-	-	58	82	104	87	83	82	68

Major Ions (mg/L)	Elements	LoR	Aquatic Ecosystems (Freshwater)[1]	Livestock Drinking Water[2]						
Calcium	Ca	1	-	1000	496	254	119	78	75	76	81
Magnesium	Mg	1	-	-	72	29	12	8	7	6	5
Sodium	Na	1	-	-	61	24	12	9	8	8	7
Potassium	K	1	-	-	51	28	16	14	14	14	13
Chloride	Cl	1	-	-	518	46	3	2	1	1	2
Fluoride	F[4]	0.1	-	2	1.5	2.2	2.6	3.0	2.8	2.9	3.0
Sulfate	SO	1	-	1000	950	816	309	191	152	177	160
Total Organic Carbon	Org_C	1	-	-	10	5	4	4	3	3	2
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**						
Aluminium	Al	0.01	0.055	5	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Antimony	Sb	0.001	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Barium	Ba	0.001	-	-	0.054	0.036	0.029	0.035	0.035	0.039	0.04
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	B	0.05	0.37	5	0.73	0.64	0.4	0.27	0.27	0.25	0.22
Cadmium	Cd	0.0001	0.0002	0.01	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	Cu	0.001	0.0014	1	0.003	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	Fe	0.05	-	-	1.20	0.08	0.92	0.38	0.12	0.24	0.07
Lead	Pb	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	Mn	0.001	1.9	-	4.210	3.140	1.220	0.762	0.595	0.586	0.479
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	0.005	0.007	0.012	0.015	0.016	0.018	0.016
Nickel	Ni	0.001	0.011	1	0.008	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	Se	0.01	0.011	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	0.010	0.005	0.002	0.001	0.001	0.002	0.001
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	0.039	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	35.80	20.00	8.68	5.83	4.93	5.41	4.93
Total Cations	meq/L	0.01	-	-	34.60	16.80	7.86	5.30	5.02	4.99	5.09
Ionic Balance	%	0.01	-	-	1.58	8.69	4.95	4.77	0.94	4.03	1.64

Calculations**	Elements								
SO_4 Release Rate	SO[4]	320	227	100	62	48	56	50
Cumulative SO Release	Cum. SO	320	547	648	709	757	813	864
Ca Release Rate	Ca	167.0	70.8	38.6	25.2	23.7	24.1	25.4
Cumulative Ca Release	Cum. Ca	167.0	237.8	276.4	301.6	325.3	349.4	374.8
Mg Release Rate	Mg	20.5	6.7	3.9	2.9	2.5	2.5	2.2
Cumulative Mg Release	Cum. Mg	20.5	27.2	31.1	34.0	36.6	39.1	41.3
Residual ANC (%)	Res. ANC	96.7	95.3	94.6	94.1	93.6	93.2	92.7
Residual Sulfur (%)	Res. S[4]	99.4	99.0	98.9	98.8	98.7	98.6	98.5
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)	0.7	1.2	0.9	0.9	0.7	0.8	0.7

Notes:

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< indicates less than the analytical detection limit. # for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm * Acidity and alkalinity data calculated in mg $CaCO_3$/L. Shaded cells exceed applied guideline values. (tri)* 0.024 g/L for trivalent Arsenic (III). (hex)* Cr (VI) = hexavalent. # for still water bodies only, moving rivers at low flow rates should not exceed 2,200µS/cm. ^ calculated based on total dissolved solids (TDS) conversion rate of 0.67% of EC. TDS is an approximate measure of inorganic dissolved salts and should not exceed 2,400mg/L for livestock drinking water. ** SO4, Ca and Mg release rates calculated in mg/kg/flush. Residual ANC assumes that all leached Mg and Ca is due to dissolution of calcite or dolomite. Total S = Total Sulfur; Scr = Chromium Reducible Sulfur; and ANC = Acid Neutralising Capacity. MPA = Maximum Potential Acidity, and NAPP = Net Acid Producing Potential.

KLC 7 Tailings: PAF (Saturated)

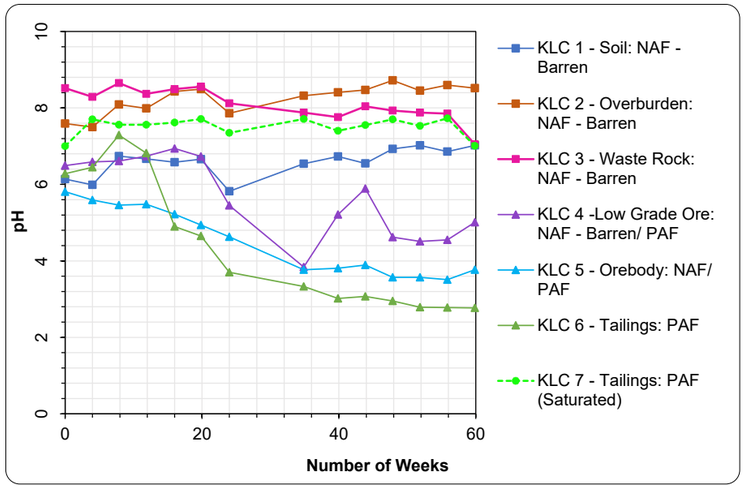
Weight (kg)											
pH (1:5)											
EC (µS/cm)											
Date					17-Dec-25	21-Jan-26	18-Feb-26	18-Mar-26	15-Apr-26	13-May-26	10-Jun-26
Number of Weeks					35	40	44	48	52	56	60
Leach Number					8	9	10	11	12	13	14
ALS Laboratory Number					EB2545238007	EB2602305007	EB2606057007	EB2609975007	EB2613493007	EB2617014007	EB2621399007
Volume On (L)					2.0	1.0	1.0	1.0	1.0	1.0	1.0
Volume Off (L)					1.104	1.030	1.021	0.999	1.005	1.008	0.996
Cum. Volume (L)					7.74	8.77	9.79	10.79	11.80	12.81	13.80
pH (RGS Measurement)	6 to 9		-		7.21	7.03	7.70	7.31	7.63	8.21	7.91
pH (ALS Measurement)					7.71	7.40	7.55	7.70	7.53	7.73	7.01
pH (deionised water used in test)			-		6.11	6.19	6.88	6.80	6.43	6.57	6.14
EC (RGS Measurement) (µS/cm)	<1,000 #		3,580^		490	515	485	458	480	530	510
EC (ALS Measurement) (µS/cm)					571	534	502	491	547	537	535
Acidity (mg/L as $CaCO_3$)*	-		-		7	8	2	8	8	6	5
Hydroxide Alkalinity (mg/L as CaCO)*	-		-		<1	<1	<1	<1	<1	<1	<1
Carbonate Alkalinity (mg/L as CaCO)*	-		-		<1	<1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity (mg/L as CaCO)*	-		-		78	76	76	101	77	82	65
Total Alkalinity (mg/L as CaCO)*	-		-		78	76	76	101	77	82	65
Net Alkalinity (mg/L as CaCO)*	-		-		71	68	74	93	69	76	60
Major Ions (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Calcium	Ca	1	-	1000	94	95	79	80	91	99	106
Magnesium	Mg	1	-	-	5	5	4	4	4	4	4
Sodium	Na	1	-	-	7	7	5	5	5	5	4
Potassium	K	1	-	-	14	13	11	10	11	11	9
Chloride	Cl	1	-	-	2	1	2	2	3	<1	<1
Fluoride	F	0.1	-	2	8.4	3.1	3	3	2.9	2.9	2.7
Sulfate	SO	1	-	1000	186	193	177	176	170	188	189
Total Organic Carbon	Org_C	1	-	-	4	2	2	2	2	<1	2
Trace metals/ metalloids (mg/L)	**Elements**	**LoR**	**Aquatic Ecosystems (Freshwater)[1]**	**Livestock Drinking Water[2]**							
Aluminium	Al	0.01	0.055	5	0.04	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Antimony	Sb	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	As	0.001	0.024 (tri)*	0.5 (total)	0.002	0.001	0.001	0.001	<0.001	<0.001	<0.001
Barium	Ba	0.001	-	-	0.057	0.046	0.044	0.043	0.046	0.046	0.046
Beryllium	Be	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	B	0.05	0.37	5	0.27	0.21	0.17	0.17	0.14	0.18	0.13
Cadmium	Cd	0.0001	0.0002	0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	Cr	0.001	0.001 (hex)*	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	Co	0.001	-	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	Cu	0.001	0.0014	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	Fe	0.05	-	-	0.3	0.35	0.31	0.24	0.11	0.11	0.08
Lead	Pb	0.001	0.0034	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	Mn	0.001	1.9	-	0.523	0.479	0.431	0.408	0.448	0.494	0.507
Mercury	Hg	0.0001	0.0006	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	Mo	0.001	-	0.15	0.012	0.009	0.007	0.006	0.004	0.004	0.003
Nickel	Ni	0.001	0.011	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	Se	0.01	0.011	0.02	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thorium	Th	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	U	0.001	-	0.1	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	V	0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	Zn	0.005	0.008	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ionic Balance			-								
Total Anions	meq/L	0.01	-	-	5.49	5.57	5.26	5.74	5.16	5.55	5.38
Total Cations	meq/L	0.01	-	-	5.76	5.79	4.77	4.79	5.37	5.77	6.02
Ionic Balance	%	0.01	-	-	2.46	1.97	4.88	8.96	1.96	1.9	5.61
Calculations**	**Elements**										
SO_4 Release Rate	SO				68	66	60	59	57	63	63
Cumulative SO Release	Cum. SO				932	998	1058	1117	1174	1237	1299
Ca Release Rate	Ca				34.5	32.6	26.9	26.6	30.4	33.2	35.2
Cumulative Ca Release	Cum. Ca				409.4	441.9	468.8	495.4	525.8	559.1	594.2
Mg Release Rate	Mg				2.6	2.4	1.7	1.7	1.7	1.7	1.3
Cumulative Mg Release	Cum. Mg				43.9	46.3	48.0	49.6	51.3	53.0	54.3
Residual ANC (%)	Res. ANC				92.0	91.4	90.9	90.5	89.9	89.3	88.7
Residual Sulfur (%)	Res. S				98.4	98.3	98.2	98.1	98.0	97.9	97.7
SO /(Ca+Mg) molar ratio	SO /(Ca+Mg)				0.7	0.8	0.8	0.8	0.7	0.7	0.7

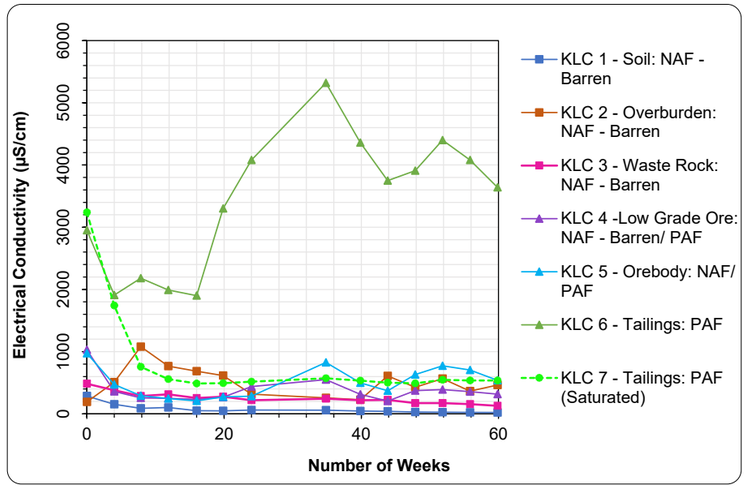
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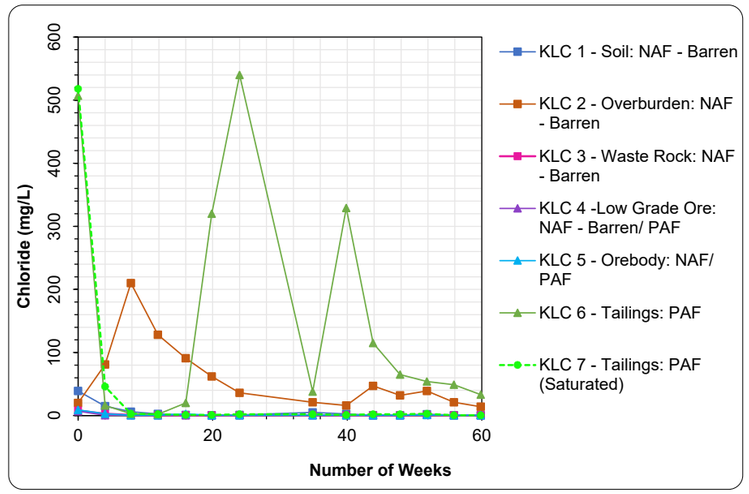
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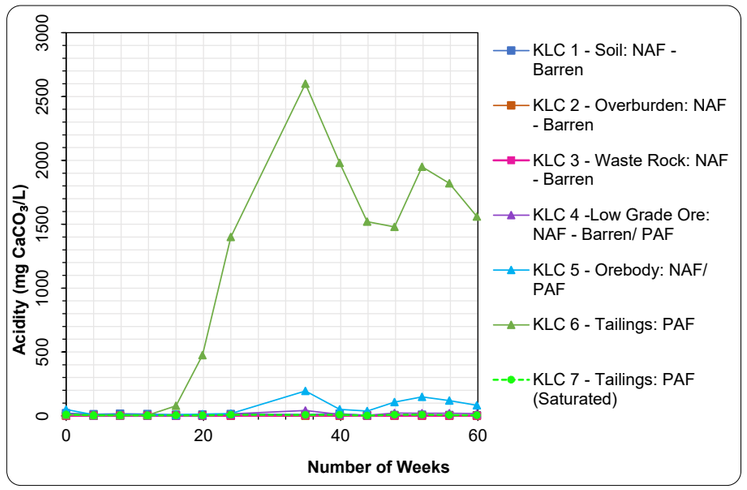
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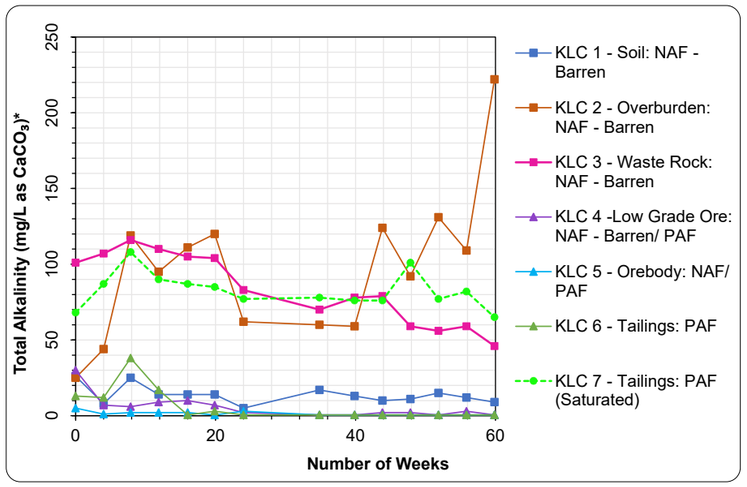
KLC Plots 1

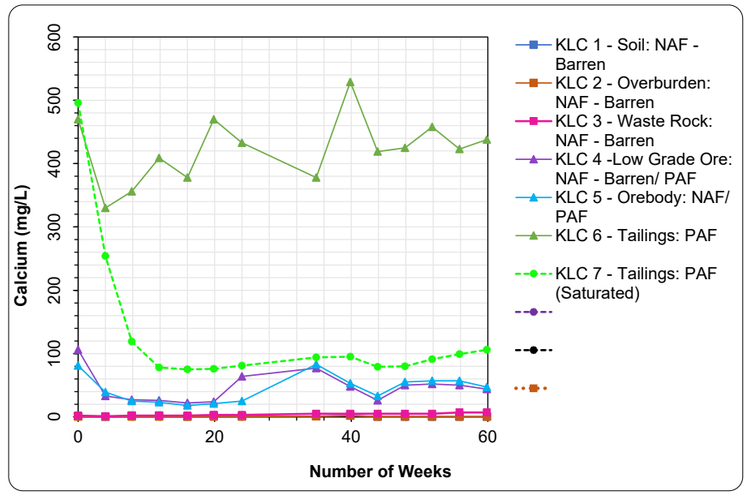

pH
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

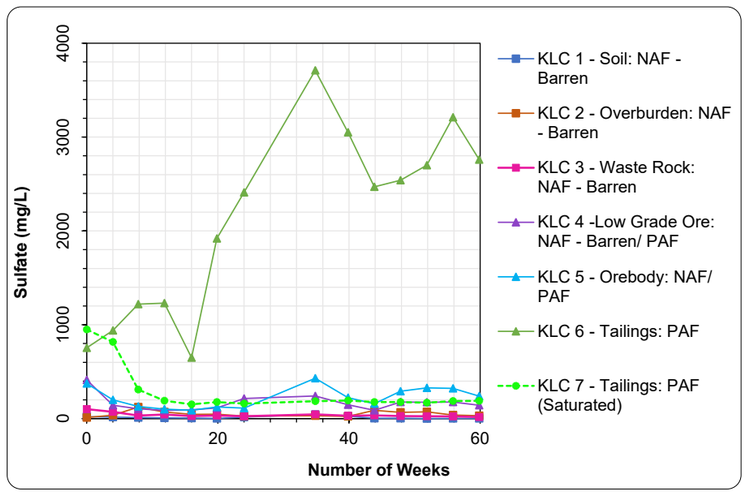

Electrical Conductivity (µS/cm)
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

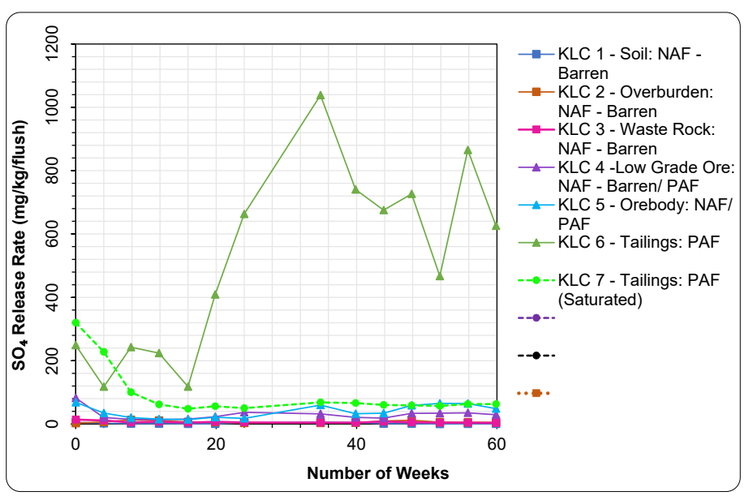

Chloride (mg/L)
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

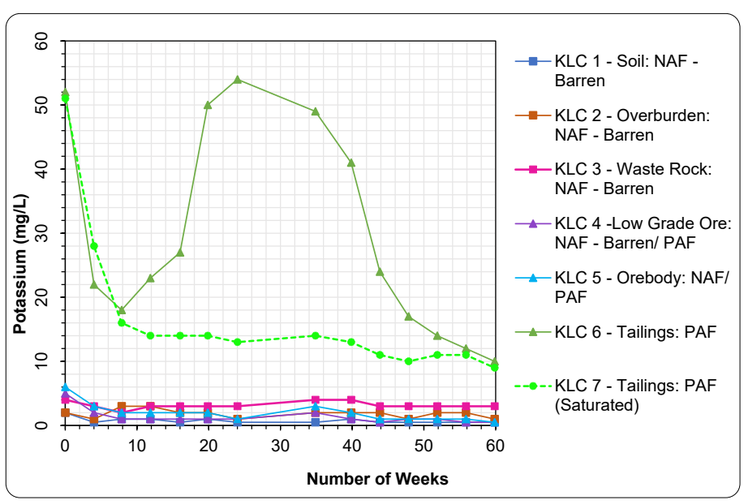

Acidity (mg CaCO3/L)
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)


Total Alkalinity (mg/L as CaCO3)*
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

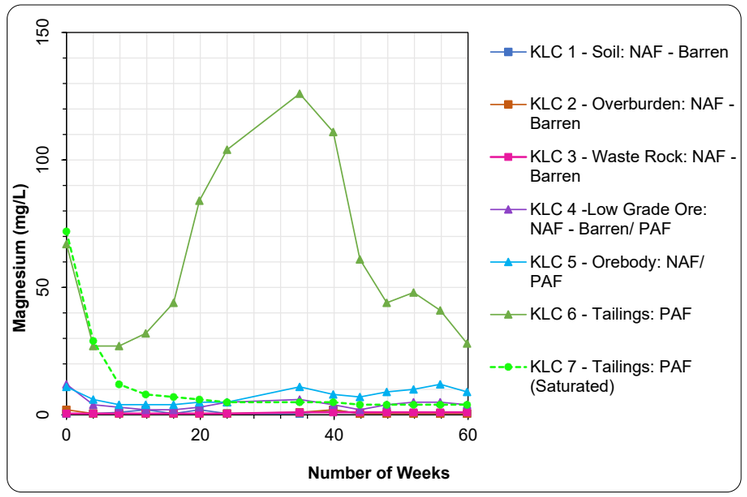

Calcium (mg/L)
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

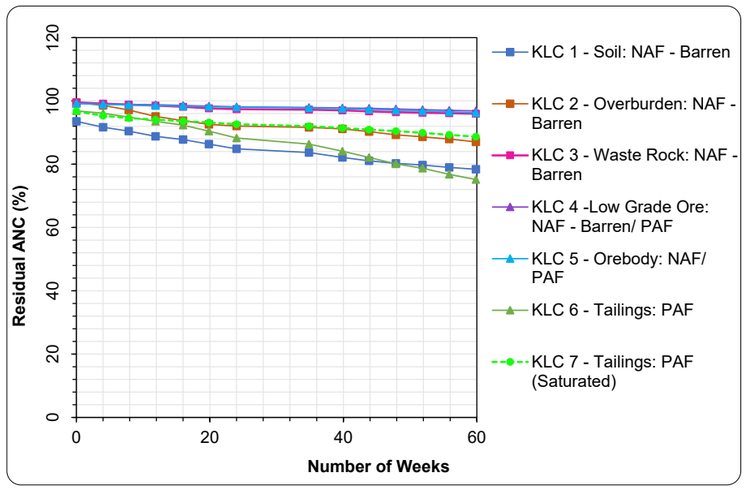

Sulfate (mg/L)
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

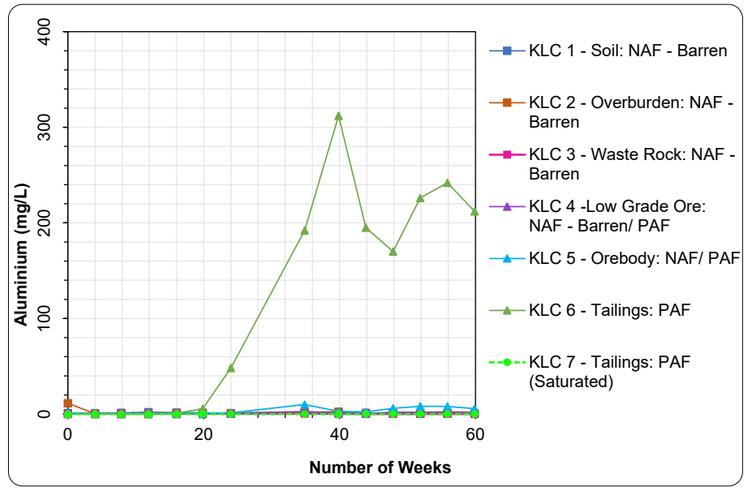

SO4 Release Rate (mg/kg/flush)
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

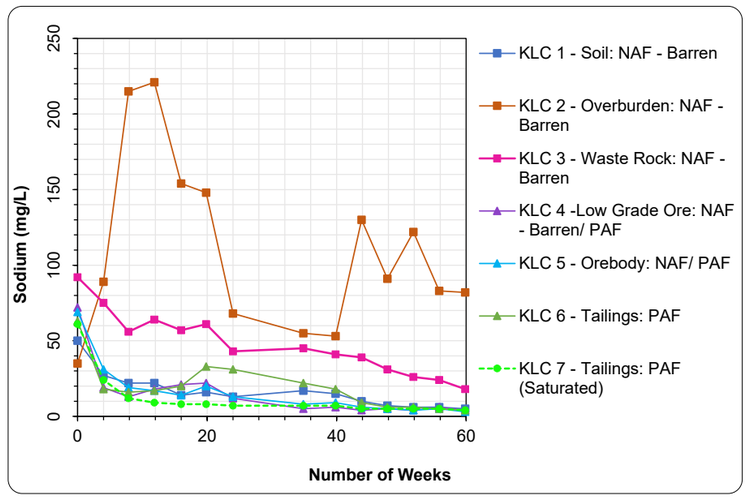

Potassium (mg/L)
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

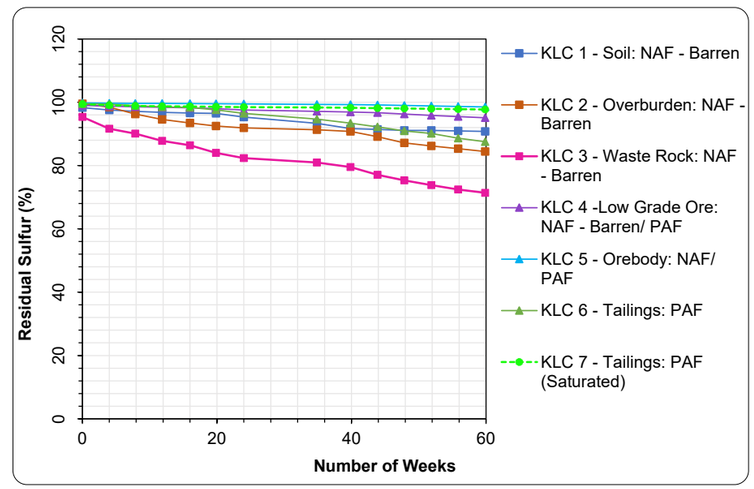
KLC Plots 2

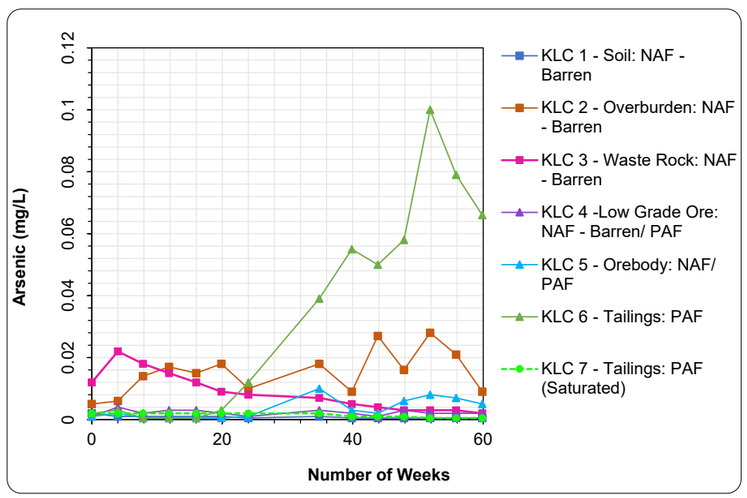

Magnesium (mg/L)
0
50
100
150
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

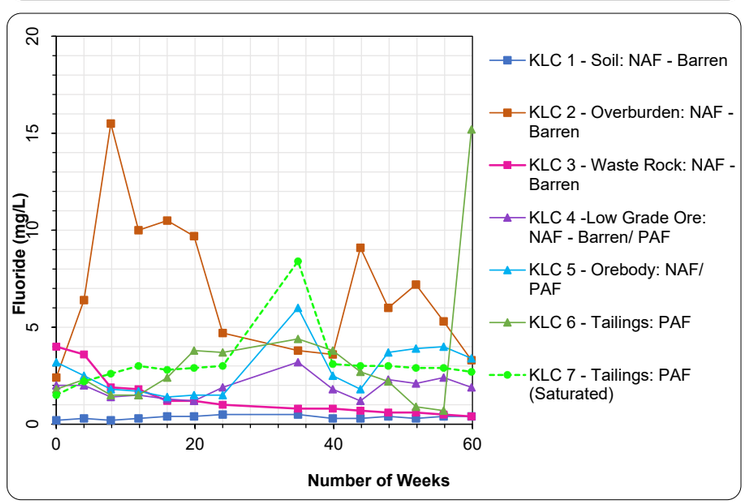

Residual ANC (%)
0
20
40
60
80
100
120
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

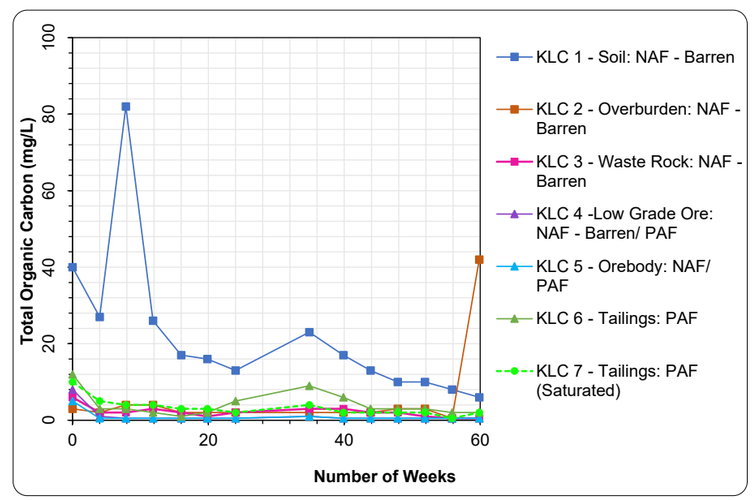

Aluminium (mg/L)
0
100
200
300
400
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

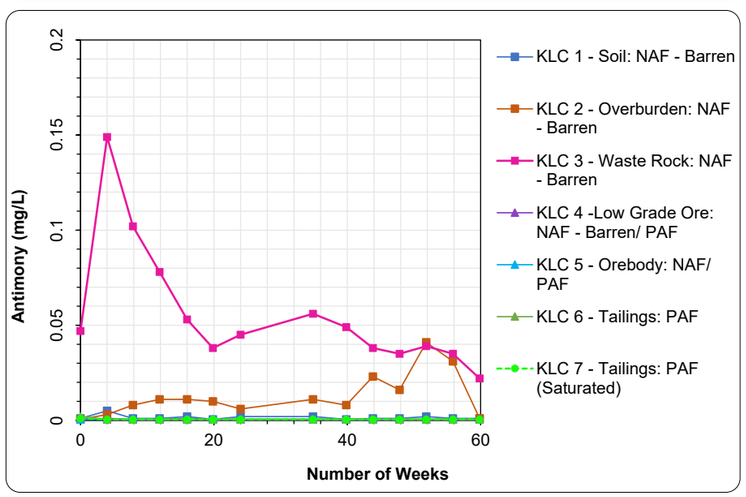

Sodium (mg/L)
0
50
100
150
200
250
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)


Residual Sulfur (%)
0
20
40
60
80
100
120
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

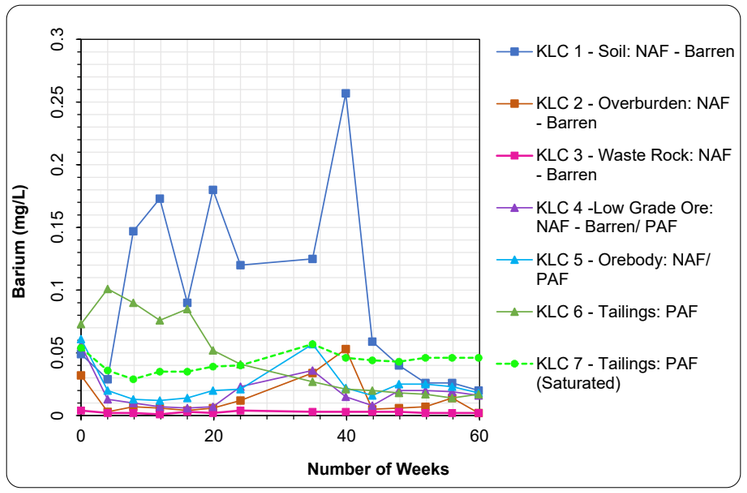

Arsenic (mg/L)
0
0.02
0.04
0.06
0.08
0.1
0.12
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

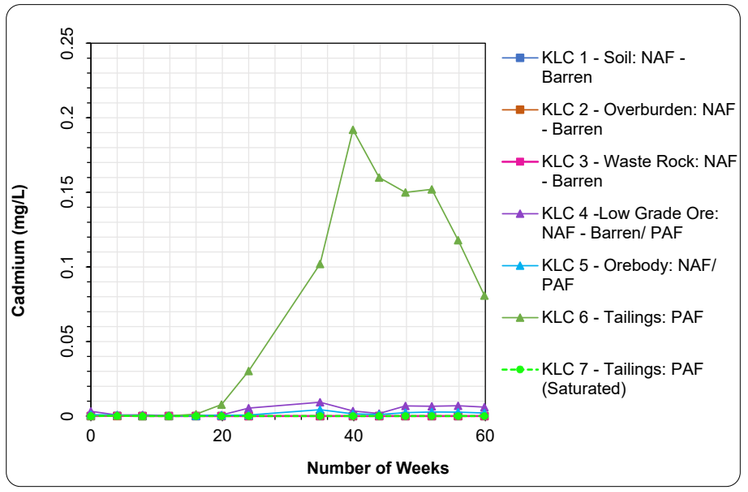

Fluoride (mg/L)
0
5
10
15
20
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

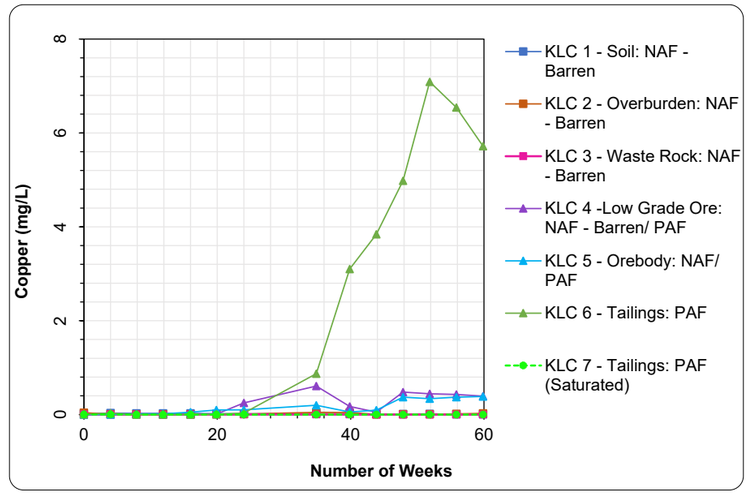

Total Organic Carbon (mg/L)
0
20
40
60
80
100
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

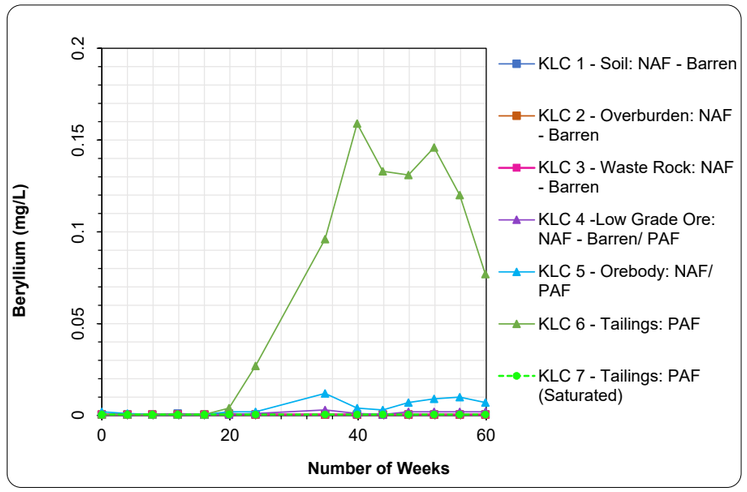

Antimony (mg/L)
0
0.05
0.1
0.15
0.2
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

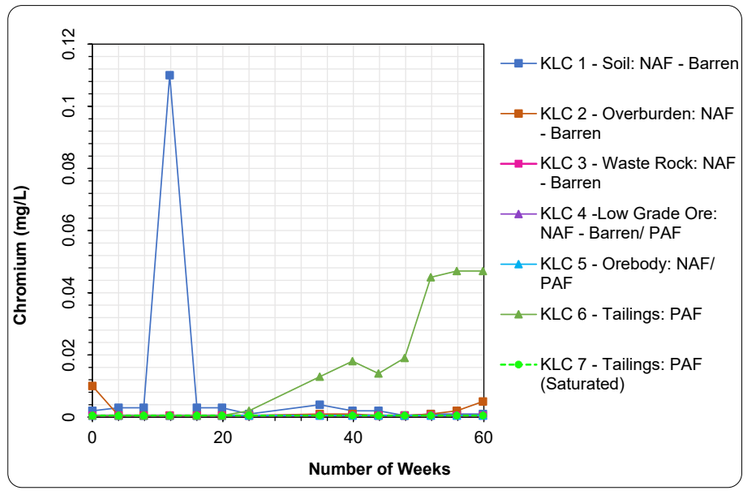
KLC Plots 3

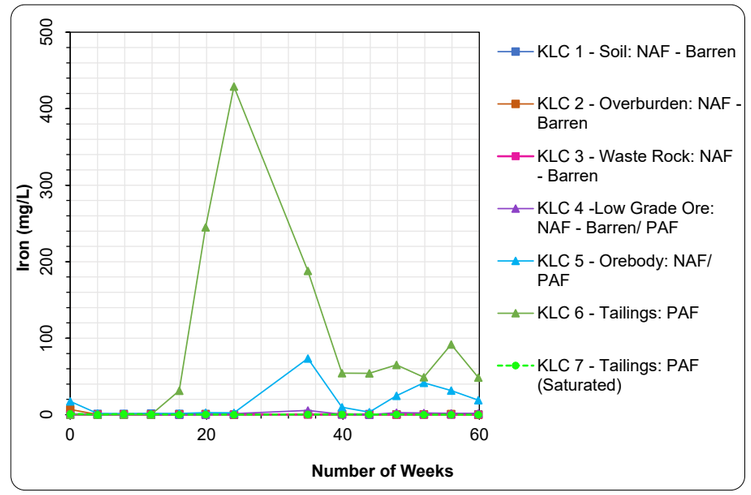

Barium (mg/L)
0
0.05
0.1
0.15
0.2
0.25
0.3
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

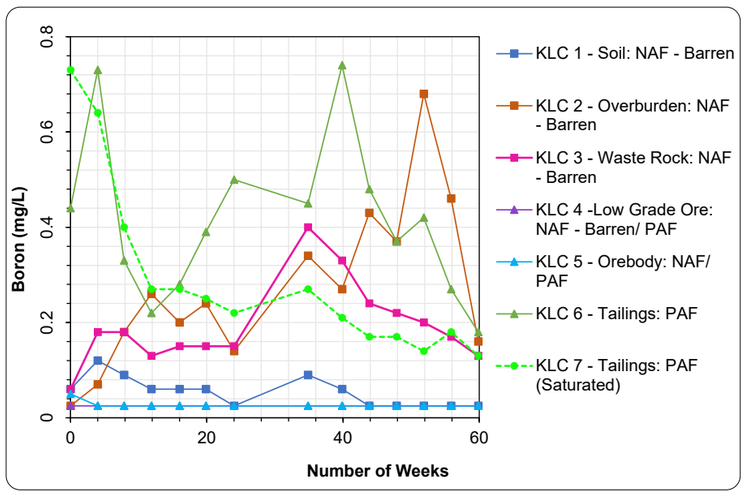

Cadmium (mg/L)
0
0.05
0.1
0.15
0.2
0.25
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

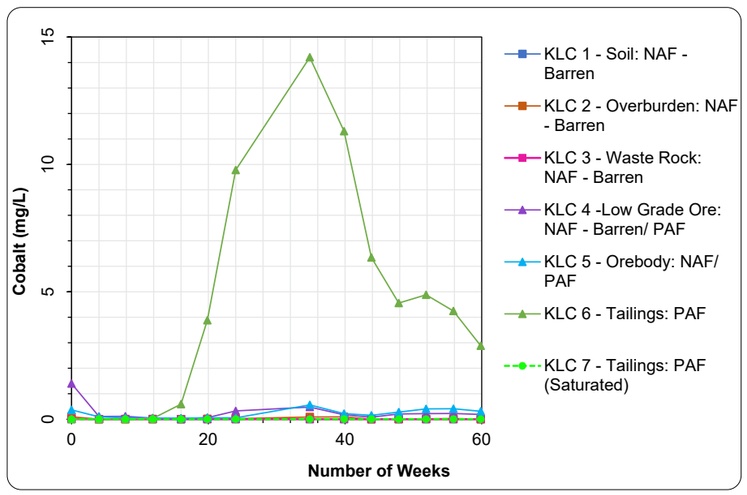

Copper (mg/L)
0
2
4
6
8
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

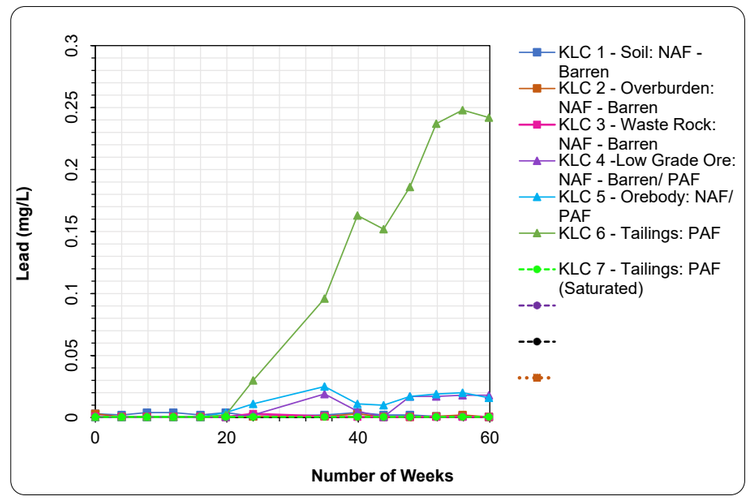

Beryllium (mg/L)
0
0.05
0.1
0.15
0.2
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)


Chromium (mg/L)
0
0.02
0.04
0.06
0.08
0.1
0.12
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

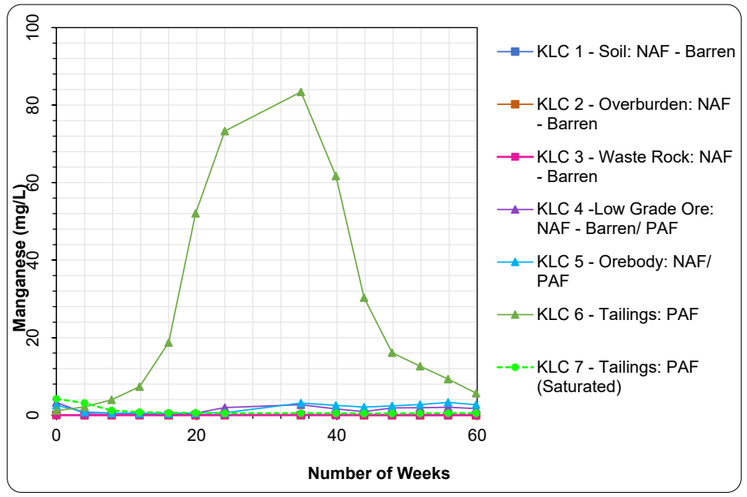

Iron (mg/L)
0
100
200
300
400
500
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

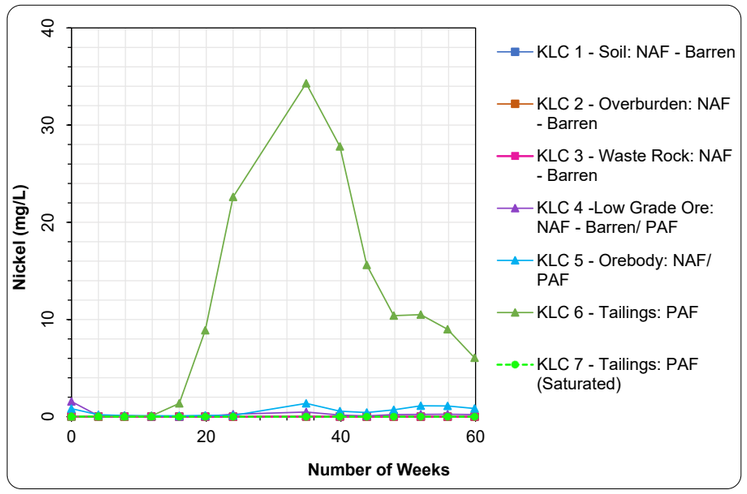

Boron (mg/L)
0
0.2
0.4
0.6
0.8
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

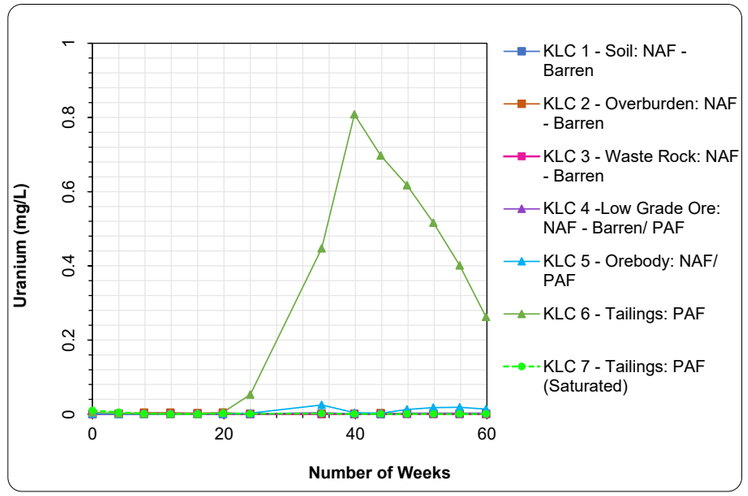

Cobalt (mg/L)
0
5
10
15
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

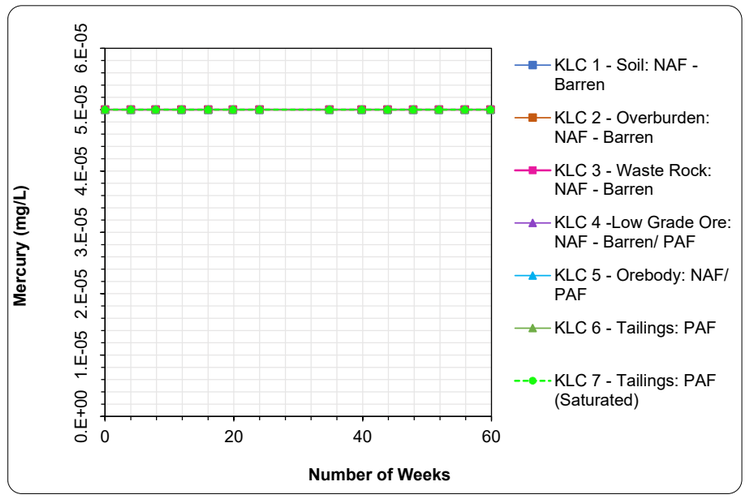

Lead (mg/L)
0
0.05
0.1
0.15
0.2
0.25
0.3
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

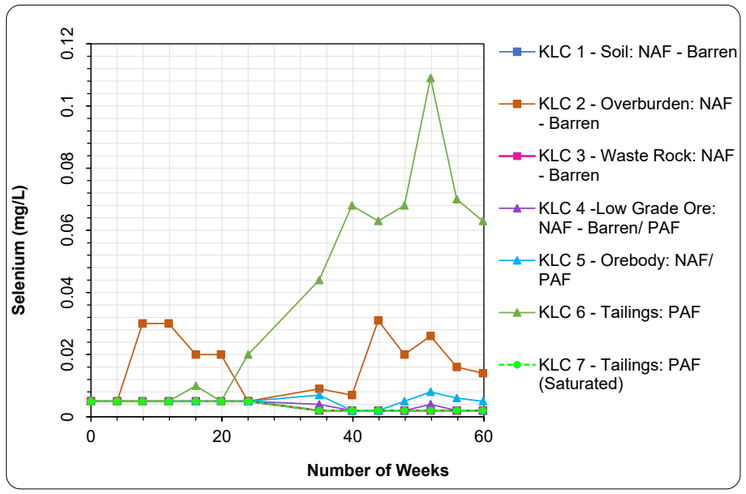
KLC Plots 4

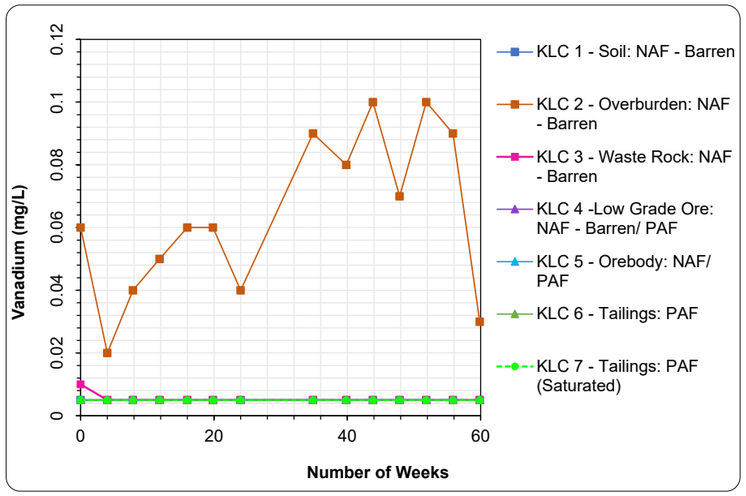

Manganese (mg/L)
0
20
40
60
80
100
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

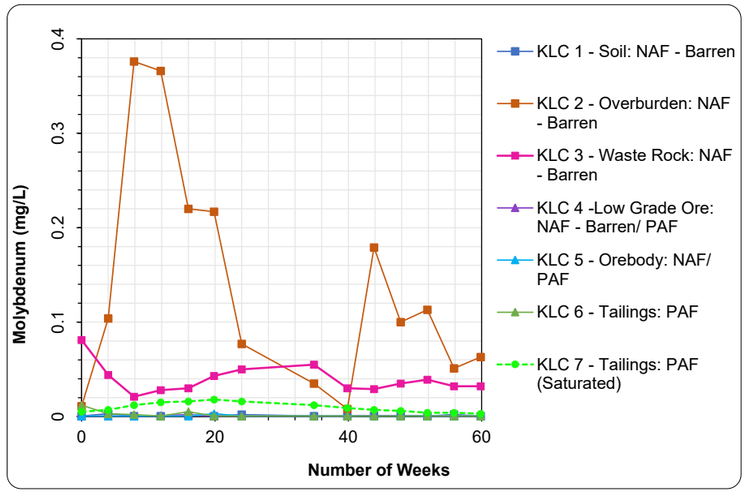

Nickel (mg/L)
0
10
20
30
40
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

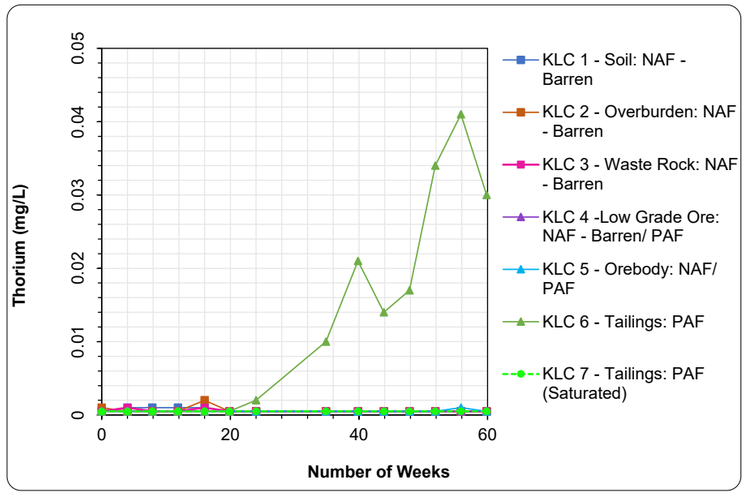

Uranium (mg/L)
0
0.2
0.4
0.6
0.8
1
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

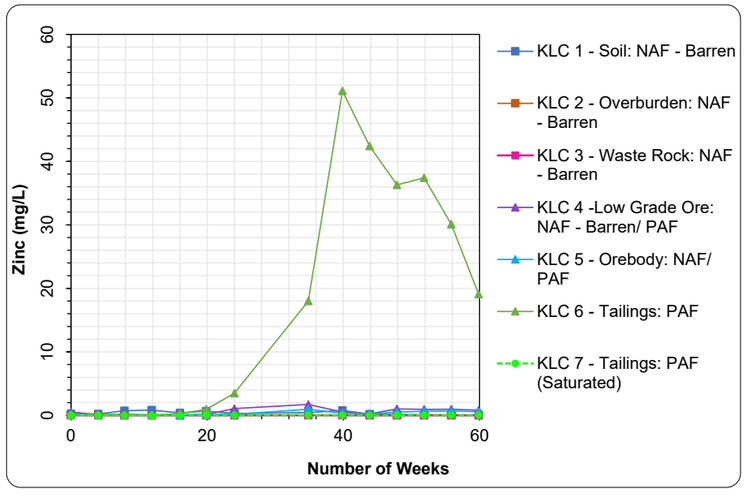

Mercury (mg/L)
0.E+00
1.E-05
2.E-05
3.E-05
4.E-05
5.E-05
6.E-05
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)


Selenium (mg/L)
0
0.02
0.04
0.06
0.08
0.1
0.12
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)


Vanadium (mg/L)
0
0.02
0.04
0.06
0.08
0.1
0.12
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)


Molybdenum (mg/L)
0
0.1
0.2
0.3
0.4
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)


Thorium (mg/L)
0
0.01
0.02
0.03
0.04
0.05
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)


Zinc (mg/L)
0
10
20
30
40
50
60
0
20
40
60
Number of Weeks
KLC 1 - Soil: NAF - Barren
KLC 2 - Overburden: NAF - Barren
KLC 3 - Waste Rock: NAF - Barren
KLC 4 -Low Grade Ore: NAF - Barren/ PAF
KLC 5 - Orebody: NAF/ PAF
KLC 6 - Tailings: PAF
KLC 7 - Tailings: PAF (Saturated)

Attachment D: RGS laboratory certificates

RGS Laboratory

MINE WASTE AND WATER MANAGEMENT

Date issued:	9/04/2025
Project no:	2024066
Revision:	1
From:	RGS Laboratory
	45 Rosedale Street
	Coopers Plains QLD 4108
Phone:	(07) 3344 1222
To:	**RGS Environmental Consultants**
Project name:	**Graphinex**
Attention:	**Melinda Hilton**
Content:	**Laboratory Test Results**

Certificate of Analysis **No: 2504001**

Work order no.:	2504001
Date samples received:	7/04/2025
No. of samples:	3
No. of samples analysed:	3

The Acid Base Account test methods used by RGS align with internationally recognised test methods such as AMIRA (2002)[1] and INAP (2025)[2].
The Total Sulfur analysis method was completed using a CS744 high temperature LECO analyser.
Quality check standards and sample duplicates were analysed for each batch of samples and the results are available on request.

Anna F.

Anna Fourie

Laboratory Supervisor

[1] AMIRA International Limited (2002). *ARD Test Handbook: Project 387A Prediction and Kinetic Control of Acid Mine Drainage.* Australian Minerals Industry Research Association, Ian Wark Research Institute and Environmental Geochemistry International Pty Ltd, May.

[2] International Network on Acid Prevention (2025). *Global Acid Rock Drainage Guide (GARD Guide).* Document prepared by Golder Associates on behalf of the International Network on Acid Prevention. Available at http://www.inap.com.au/.

Project name:	Graphinex	Work Order no.:	2504001
Project no.:	2024066	Date:	9/04/2025

Acid Base Account results

Client Sample ID	Test	$pH_{(1:5)}$	$EC_{(1:5)}$	ANC	Fizz rating	Total Sulfur	NAPP (calc)
	Unit	pH	µS/cm	kg H_2SO_4/t	Fizz score	%	kg H_2SO_4/t
	Limit of Reporting (LOR)	*0.1*	*1*	*1*	*0*	*0.01*	*1*
	RGS Sample ID	**Results**					
Tailings 1	2024066_001	8.23	392	13.1	2	1.96	46.8
Tailings 2	2024066_002	8.34	341	16.7	2	1.89	41.1
Tailings 3	2024066_003	8.23	390	14.6	2	1.91	43.9
-	DI water	5.92	1.1	-	-	-	-

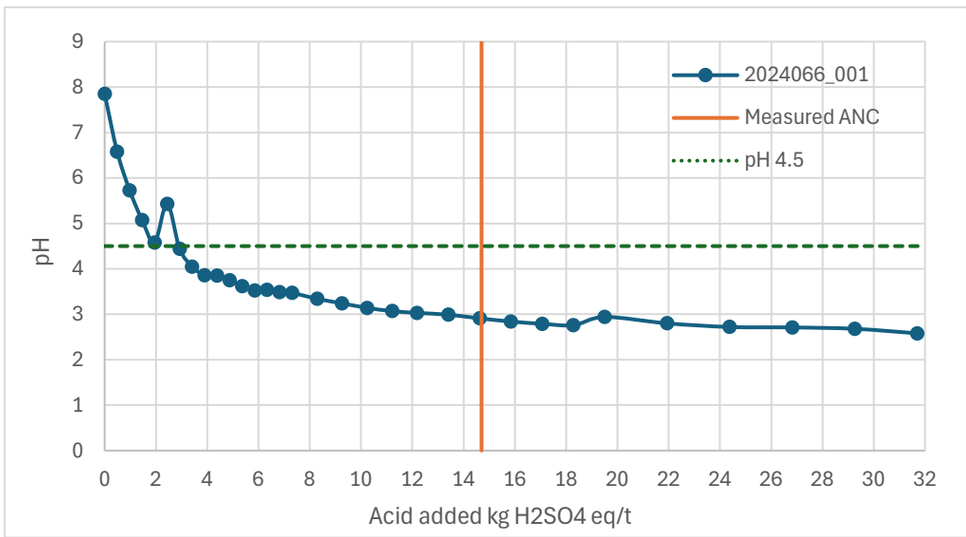
Client Sample ID	Test	NAGpH	NAG pH 4.5	NAG pH 7.0
	Unit	pH	kg H_2SO_4/t	kg H_2SO_4/t
	Limit of Reporting (LOR)	*0.1*	*0.5*	*0.5*
	RGS Sample ID	**Results**		
Tailings 1	2024066_001	2.33	29.3	38.6
Tailings 2	2024066_002	2.48	29.3	38.5
Tailings 3	2024066_003	2.43	29.4	37.0

Client Sample ID	Test	Total Carbon
	Unit	%
	Limit of Reporting (LOR)	*0.1*
	RGS Sample ID	
Tailings 1	2024066_001	0.54
Tailings 2	2024066_002	0.76
Tailings 3	2024066_003	0.59

Acid Base Characteristic Curve (ABCC)

Project name:	Graphinex	Check pH 7	7.00
Project ID:	2024066	Check pH 4	4.00
Date:	10/04/2025	Analyst:	AF
		Mass sample (g):	2.01
Sample ID:	2024066_001	[HCl] M	0.1

Addition	ml HCl added	pH	Total Vol HCl	Acid added kg H_2SO_4/t	Addition	ml HCl added	pH	Total Vol HCl	Acid added kg H_2SO_4/t
0	0	7.85	0.0	0.0	24	0.5	2.79	7.0	17.1
1	0.2	6.58	0.2	0.5	25	0.5	2.76	7.5	18.3
2	0.2	5.73	0.4	1.0	26	0.5	2.94	8.0	19.5
3	0.2	5.07	0.6	1.5	27	1	2.80	9.0	21.9
4	0.2	4.58	0.8	2.0	28	1	2.72	10.0	24.4
5	0.2	5.43	1.0	2.4	29	1	2.71	11.0	26.8
6	0.2	4.44	1.2	2.9	30	1	2.68	12.0	29.3
7	0.2	4.05	1.4	3.4	31	1	2.58	13.0	31.7
8	0.2	3.86	1.6	3.9	32				
9	0.2	3.85	1.8	4.4	33				
10	0.2	3.75	2.0	4.9	34				
11	0.2	3.62	2.2	5.4	35				
12	0.2	3.52	2.4	5.9	36				
13	0.2	3.54	2.6	6.3	37				
14	0.2	3.49	2.8	6.8	38				
15	0.2	3.47	3.0	7.3	39				
16	0.4	3.34	3.4	8.3	40				
17	0.4	3.24	3.8	9.3	41				
18	0.4	3.14	4.2	10.2	42				
19	0.4	3.07	4.6	11.2	43				
20	0.4	3.03	5.0	12.2	44				
21	0.5	2.99	5.5	13.4	45				
22	0.5	2.91	6.0	14.6	46				
23	0.5	2.84	6.5	15.8	47				



$ANC_{4.5}$

~ 3 kg H_2SO_4/t

Attachment E: ALS laboratory certificates

CERTIFICATE OF ANALYSIS

Work Order	: **EB2433615**	Page	: 1 of 20
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 3/30 LENSWORTH STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2023072 AARC Graphinex	Date Samples Received	: 30-Sep-2024 14:35
Order number	: ----	Date Analysis Commenced	: 03-Oct-2024
C-O-C number	: ----	Issue Date	: 16-Oct-2024 15:27
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 82		
No. of samples analysed	: 82		

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.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Acid Sulphate Soils, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, 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.

- Particular samples have been crushed prior to preparation and analysis as per client request on the Chain of Custody. Please refer to SRN for further details.
- 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)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__042 B480634 24ESD001 0.3 - 1 m	2023072__043 B480635 24ESD001 3 - 3.5 m	2023072__044 B480636 24ESD001 8.5 - 9 m	2023072__045 B480637 24ESD001 14 - 14.5 m	2023072__046 B480638 24ESD001 19.5 - 20 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
				EB2433615-001	EB2433615-002	EB2433615-003	EB2433615-004	EB2433615-005	
				Result	Result	Result	Result	Result	
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	**5.0**	**9.3**	**9.4**	**9.4**	**9.2**	
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t	**0.3**	**-0.8**	**-3.5**	**-1.9**	**-2.4**	
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	**5**	**131**	**248**	**356**	**342**	
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	<0.5	**1.1**	**3.5**	**2.2**	**2.7**	
ANC as CaCO3	----	0.1	% CaCO3	<0.1	**0.1**	**0.4**	**0.2**	**0.3**	
Fizz Rating	----	0	Fizz Unit	**0**	**0**	**0**	**0**	**0**	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	**0.01**	**0.01**	<0.01	**0.01**	**0.01**	
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%	**0.19**	**0.05**	**0.04**	**0.04**	**0.04**	

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__047 B480639 24ESD001 25 - 25.5 m	2023072__048 B480640 24ESD001 30.5 - 31 m	2023072__049 B480641 24ESD001 36 - 36.5 m	2023072__050 B480642 24ESD001 41.5 - 42 m	2023072__051 B480643 24ESD001 47 - 47.5 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
					EB2433615-006	EB2433615-007	EB2433615-008	EB2433615-009	EB2433615-010
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		**9.2**	**9.0**	**8.9**	**9.1**	**9.2**
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		**-2.9**	**-2.4**	**-2.8**	**-1.7**	**-2.4**
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		**267**	**149**	**120**	**68**	**52**
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		**2.9**	**2.4**	**2.8**	**2.3**	**2.4**
ANC as CaCO3	----	0.1	% CaCO3		**0.3**	**0.2**	**0.3**	**0.2**	**0.2**
Fizz Rating	----	0	Fizz Unit		**0**	**0**	**0**	**0**	**0**
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	<0.01	<0.01	**0.02**	<0.01
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%		**0.04**	**0.05**	**0.03**	<0.02	**0.02**

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__052 B480644 24ESD001 52.5 - 53 m	2023072__053 B480647 24ESD001B 74 - 74.5 m	2023072__054 B480648 24ESD001B 89.5 - 90 m	2023072__055 B480649 24ESD001B 98.6 - 99.1 m	2023072__056 B480650 24ESD001B 105 - 105.5 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
				EB2433615-011	EB2433615-012	EB2433615-013	EB2433615-014	EB2433615-015	
				Result	Result	Result	Result	Result	
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	**9.2**	**6.4**	**8.8**	**9.0**	**7.7**	
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t	**-2.8**	**29.7**	**-6.8**	**-2.9**	**33.4**	
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	**44**	**577**	**182**	**124**	**287**	
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	**2.8**	**2.4**	**8.3**	**8.1**	**8.2**	
ANC as CaCO3	----	0.1	% CaCO3	**0.3**	**0.2**	**0.8**	**0.8**	**0.8**	
Fizz Rating	----	0	Fizz Unit	**0**	**0**	**1**	**1**	**1**	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	**1.05**	**0.05**	**0.17**	**1.36**	
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%	**0.04**	**2.84**	**2.44**	**10.6**	**6.72**	

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	2023072__057 B480651 24ESD001B 120.5 - 121 m	2023072__058 B480652 24ESD001B 136 - 136.5 m	2023072__059 B480653 24ESD001B 151.5 - 152 m	2023072__060 B480654 24ESD001B 167 - 167.5 m	2023072__061 B480655 24ESD001B 182.5 - 183 m
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2433615-016	EB2433615-017	EB2433615-018	EB2433615-019	EB2433615-020
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	8.5	8.3	8.3	8.5	8.9
EA009: Net Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	29.6	62.5	58.9	43.7	33.1
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	95	92	71	83	140
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	7.7	2.4	3.2	8.0	11.6
ANC as CaCO3	----	0.1	% CaCO3	0.8	0.2	0.3	0.8	1.2
Fizz Rating	----	0	Fizz Unit	1	0	0	1	1
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	1.22	2.12	2.03	1.69	1.46
EP003TC: Total Carbon (TC) in Soil								
Total Carbon	TC	0.02	%	7.63	11.9	6.39	6.64	5.41

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__062 B480656 24ESD001B 184.3 - 184.8 m	2023072__063 B480657 24ESD001B 198 - 198.5 m	2023072__064 B480658 24ESD001B 213.5 - 214 m	2023072__065 B480659 24ESD001B 229 - 229.5 m	2023072__066 B480660 24ESD001B 244.5 - 245 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
				EB2433615-021	EB2433615-022	EB2433615-023	EB2433615-024	EB2433615-025	
				Result	Result	Result	Result	Result	
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	9.2	8.6	8.3	7.4	8.2	
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t	-13.1	20.7	52.0	96.7	43.9	
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	112	64	68	103	71	
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	16.5	9.6	9.2	11.3	8.1	
ANC as CaCO3	----	0.1	% CaCO3	1.7	1.0	0.9	1.2	0.8	
Fizz Rating	----	0	Fizz Unit	1	1	1	1	1	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	0.11	0.99	2.00	3.53	1.70	
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%	3.86	2.34	6.59	3.03	5.28	

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	2023072__067 B480661 24ESD002 0.3 - 1 m	2023072__068 B480662 24ESD002 4 - 4.5 m	2023072__069 B480663 24ESD002 9.5 - 10 m	2023072__070 B480664 24ESD002 20 - 20.5 m	2023072__071 B480666 24ESD002 41 - 41.5 m
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2433615-026	EB2433615-027	EB2433615-028	EB2433615-029	EB2433615-030
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**6.3**	**9.5**	**9.2**	**9.8**	**9.0**
EA009: Net Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	**-0.7**	**-2.6**	**-2.6**	**-7.7**	**-2.4**
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	**12**	**161**	**216**	**643**	**50**
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	**0.7**	**3.2**	**2.6**	**7.7**	**2.4**
ANC as CaCO3	----	0.1	% CaCO3	<0.1	**0.3**	**0.3**	**0.8**	**0.2**
Fizz Rating	----	0	Fizz Unit	**0**	**0**	**0**	**0**	**0**
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	**0.02**	<0.01	<0.01	<0.01
EP003TC: Total Carbon (TC) in Soil								
Total Carbon	TC	0.02	%	**0.11**	**0.03**	**0.03**	**0.06**	<0.02

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__072 B480667 24ESD002 48 - 48.5 m	2023072__073 B480668 24ESD002 52 - 52.5 m	2023072__074 B480669 24ESMD002 70 - 70.5 m	2023072__075 B480670 24ESMD002 85.5 - 86 m	2023072__076 B480671 24ESMD002 101 - 101.5 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
					EB2433615-031	EB2433615-032	EB2433615-033	EB2433615-034	EB2433615-035
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		**9.0**	**9.3**	**9.0**	**6.2**	**7.2**
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		**-4.1**	**-16.7**	**-112**	**-8.0**	**35.2**
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		**44**	**382**	**194**	**1760**	**376**
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		**4.1**	**18.2**	**113**	**12.9**	**7.9**
ANC as CaCO3	----	0.1	% CaCO3		**0.4**	**1.9**	**11.5**	**1.3**	**0.8**
Fizz Rating	----	0	Fizz Unit		**0**	**1**	**3**	**1**	**1**
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	**0.05**	**0.03**	**0.16**	**1.41**
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%		**0.02**	**1.21**	**7.91**	**1.76**	**6.85**

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__077 B480672 24ESMD002 116.5 - 117 m	2023072__078 B480673 24ESMD002 124 - 124.5 m	2023072__079 B480674 24ESMD002 132 - 132.5 m	2023072__080 B480675 24ESMD002 147.5 - 148 m	2023072__081 B480676 24ESMD002 163 - 163.5 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
				EB2433615-036	EB2433615-037	EB2433615-038	EB2433615-039	EB2433615-040	
				Result	Result	Result	Result	Result	
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	9.0	9.6	9.3	8.7	9.0	
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t	-17.4	-36.0	-20.8	16.7	-1.7	
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	139	236	104	140	83	
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	19.5	36.6	22.3	11.1	10.0	
ANC as CaCO3	----	0.1	% CaCO3	2.0	3.7	2.3	1.1	1.0	
Fizz Rating	----	0	Fizz Unit	1	2	1	1	1	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	0.07	0.02	0.05	0.91	0.27	
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%	8.46	1.26	2.95	3.39	6.25	

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__082 B480677 24ESMD002 178.5 - 179 m	2023072__083 B480678 24ESMD002 194 - 194.5 m	2023072__084 B480679 24ESMD002 209.5 - 210 m	2023072__085 B480680 24ESMD002 225 - 225.5 m	2023072__086 B480681 24ESMD001 57 - 57.5 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
				EB2433615-041	EB2433615-042	EB2433615-043	EB2433615-044	EB2433615-045	
				Result	Result	Result	Result	Result	
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	**8.0**	**7.5**	**7.4**	**7.5**	**9.1**	
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t	**45.5**	**28.2**	**45.8**	**42.9**	**-12.2**	
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	**90**	**171**	**92**	**129**	**393**	
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	**9.3**	**13.1**	**8.7**	**9.4**	**14.3**	
ANC as CaCO3	----	0.1	% CaCO3	**1.0**	**1.3**	**0.9**	**1.0**	**1.5**	
Fizz Rating	----	0	Fizz Unit	**1**	**1**	**1**	**1**	**1**	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	**1.79**	**1.35**	**1.78**	**1.71**	**0.07**	
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%	**7.98**	**4.79**	**7.32**	**6.31**	**1.21**	

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__087 B480682 24ESMD001 60 - 60.5 m	2023072__088 B480683 24ESMD001 70.5 - 71 m	2023072__089 B480684 24ESMD001 86 - 86.5 m	2023072__090 B480685 24ESMD001 99 - 99.5 m	2023072__091 B480686 24ESMD001 101.5 - 102 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
					EB2433615-046	EB2433615-047	EB2433615-048	EB2433615-049	EB2433615-050
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		**8.4**	**8.9**	**9.4**	**9.7**	**9.6**
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		**-9.3**	**-17.1**	**-15.6**	**-28.4**	**-9.3**
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		**76**	**171**	**120**	**156**	**134**
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		**9.9**	**17.7**	**15.6**	**28.4**	**9.3**
ANC as CaCO3	----	0.1	% CaCO3		**1.0**	**1.8**	**1.6**	**2.9**	**0.9**
Fizz Rating	----	0	Fizz Unit		**1**	**1**	**1**	**1**	**1**
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		**0.02**	**0.02**	<0.01	<0.01	<0.01
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%		**0.59**	**0.18**	**0.15**	**0.31**	**0.02**

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__092 B480687 24ESMD001 117 - 117.5 m	2023072__093 B480688 24ESMD001 132.5 - 133 m	2023072__094 B480689 24ESMD001 148 - 148.5 m	2023072__095 B480690 24ESMD001 163.5 - 164 m	2023072__096 B480691 24ESMD001 179 - 179.5 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
				EB2433615-051	EB2433615-052	EB2433615-053	EB2433615-054	EB2433615-055	
				Result	Result	Result	Result	Result	
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	**9.0**	**9.0**	**8.2**	**9.1**	**8.9**	
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t	**5.3**	**15.6**	**66.9**	**-21.8**	**40.9**	
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	**137**	**104**	**90**	**116**	**116**	
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	**14.9**	**10.4**	**7.8**	**24.0**	**9.3**	
ANC as CaCO3	----	0.1	% CaCO3	**1.5**	**1.0**	**0.8**	**2.4**	**0.9**	
Fizz Rating	----	0	Fizz Unit	**1**	**1**	**1**	**1**	**1**	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	**0.66**	**0.85**	**2.44**	**0.07**	**1.64**	
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%	**7.45**	**5.10**	**10.5**	**0.83**	**7.62**	

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	2023072__097 B480692 24ESMD001 194.5 - 195 m	2023072__098 B480693 24ESMD001 210 - 210.5 m	2023072__099 B480694 24ESD004 5.4 - 6 m	2023072__100 B480695 24ESD004 8 - 8.5 m	2023072__101 B480696 24ESD004 13.5 - 14 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit		EB2433615-056	EB2433615-057	EB2433615-058	EB2433615-059	EB2433615-060
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.3	8.9	8.8	9.1	9.8
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		33.6	15.0	-1.4	-5.6	-34.6
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		171	167	109	472	966
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		12.0	12.5	1.4	5.6	34.6
ANC as CaCO3	----	0.1	% CaCO3		1.2	1.3	0.1	0.6	3.5
Fizz Rating	----	0	Fizz Unit		1	1	0	0	1
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		1.49	0.90	<0.01	<0.01	<0.01
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%		3.66	3.70	0.06	<0.02	0.36

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	2023072__102 B480697 24ESD004 19 - 19.5 m	2023072__103 B480698 24ESD004 24.5 - 25 m	2023072__104 B480699 24ESD004 30 - 30.5 m	2023072__105 B480700 24ESD004 40 - 40.5 m	2023072__106 B480701 24ESD004 45.5 - 46 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
					EB2433615-061	EB2433615-062	EB2433615-063	EB2433615-064	EB2433615-065
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		**8.8**	**9.2**	**8.6**	**8.8**	**8.9**
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		**-2.2**	**-3.9**	**-2.3**	**-4.8**	**-4.1**
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		**462**	**504**	**261**	**194**	**91**
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		**2.8**	**4.2**	**2.6**	**5.4**	**4.1**
ANC as CaCO3	----	0.1	% CaCO3		**0.3**	**0.4**	**0.3**	**0.5**	**0.4**
Fizz Rating	----	0	Fizz Unit		**0**	**0**	**0**	**0**	**0**
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		**0.02**	**0.01**	**0.01**	**0.02**	<0.01
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%		**0.04**	**0.03**	**0.04**	**0.03**	**0.03**

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__107 B480702 24ESD004 51 - 51.5 m	2023072__108 B480703 24ESD004 56.5 - 57 m	2023072__109 B480704 24ESD004 58 - 58.5 m	2023072__110 B480705 24ESD004 62.85 - 63.1 m	2023072__111 B480706 24ESD004 64 - 64.5 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
					EB2433615-066	EB2433615-067	EB2433615-068	EB2433615-069	EB2433615-070
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		9.1	8.9	9.0	7.2	8.6
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		-9.3	-6.9	-13.0	-7.4	-12.2
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		102	95	356	220	117
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		9.3	7.2	15.5	10.5	12.5
ANC as CaCO3	----	0.1	% CaCO3		0.9	0.7	1.6	1.1	1.3
Fizz Rating	----	0	Fizz Unit		1	1	1	1	1
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		<0.01	0.01	0.08	0.10	0.01
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%		0.04	0.73	0.99	2.30	0.76

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__112 B480707 24ESD004 69.5 - 70 m	2023072__113 B480708 24ESD004 82 - 82.5 m	2023072__114 B480709 24ESD004 92 - 92.5 m	2023072__115 B480710 24ESD004 102.5 - 103 m	2023072__116 B480711 24ESD004 118 - 118.5 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
				EB2433615-071	EB2433615-072	EB2433615-073	EB2433615-074	EB2433615-075	
				Result	Result	Result	Result	Result	
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	**9.1**	**9.3**	**9.2**	**9.4**	**8.4**	
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t	**-7.4**	**-22.2**	**-57.1**	**-33.5**	**38.5**	
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	**95**	**161**	**233**	**258**	**78**	
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	**7.4**	**22.2**	**57.1**	**33.5**	**8.6**	
ANC as CaCO3	----	0.1	% CaCO3	**0.8**	**2.3**	**5.8**	**3.4**	**0.9**	
Fizz Rating	----	0	Fizz Unit	**1**	**1**	**2**	**2**	**1**	
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	<0.01	<0.01	**1.54**	
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%	**0.06**	**0.15**	**4.34**	**19.5**	**7.89**	

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072__117 B480712 24ESD004 133.5 - 134 m	2023072__118 B480713 24ESD004 149 - 149.5 m	2023072__119 B480714 24ESD004 164.5 - 165 m	2023072__120 B480715 24ESD004 180 - 180.5 m	2023072__121 B480716 24ESD004 195.5 - 196 m
				Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
					EB2433615-076	EB2433615-077	EB2433615-078	EB2433615-079	EB2433615-080
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.6	8.0	8.3	9.0	8.4
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		31.0	50.8	44.5	6.8	30.3
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		175	107	95	197	104
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		13.1	10.4	8.7	14.0	8.9
ANC as CaCO3	----	0.1	% CaCO3		1.3	1.1	0.9	1.4	0.9
Fizz Rating	----	0	Fizz Unit		1	1	1	1	1
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		1.44	2.00	1.74	0.68	1.28
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%		5.39	7.97	6.91	1.81	3.87

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	2023072__122 B480717 24ESD004 211 - 211.5 m	----	----	----	----
			Sampling date / time	30-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2433615-081	--------	--------	--------	--------
				Result	----	----	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**7.6**	**----**	**----**	**----**	**----**
EA009: Net Acid Production Potential								
Net Acid Production Potential	----	0.5	kg H2SO4/t	**52.1**	**----**	**----**	**----**	**----**
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	**107**	**----**	**----**	**----**	**----**
EA013: Acid Neutralising Capacity								
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t	**10.3**	**----**	**----**	**----**	**----**
ANC as CaCO3	----	0.1	% CaCO3	**1.0**	**----**	**----**	**----**	**----**
Fizz Rating	----	0	Fizz Unit	**1**	**----**	**----**	**----**	**----**
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	**2.04**	**----**	**----**	**----**	**----**
EP003TC: Total Carbon (TC) in Soil								
Total Carbon	TC	0.02	%	**8.96**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: SOIL)				Sample ID	DI water for 1:5	----	----	----	----
				Sampling date / time	30-Sep-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2433615-082	--------	--------	--------	--------
					Result	----	----	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		**5.4**	**----**	**----**	**----**	**----**
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		<1	**----**	**----**	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **EB2435907**	Page	: 1 of 9
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 3/30 LENSWORTH STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2023072 AARC Graphinex - Stage 2	Date Samples Received	: 17-Oct-2024 16:29
Order number	: ----	Date Analysis Commenced	: 28-Oct-2024
C-O-C number	: ----	Issue Date	: 31-Oct-2024 18:33
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 35		
No. of samples analysed	: 35		

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.

Signatories	*Position*	*Accreditation Category*
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, 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.

- **The samples in this work order have been rebatched from EB2433615.**

Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)			Sample ID	2023072__053 EB2433615012	2023072__055 EB2433615014	2023072__056 EB2433615015	2023072__057 EB2433615016	2023072__058 EB2433615017
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2435907-001	EB2435907-002	EB2435907-003	EB2435907-004	EB2435907-005
				Result	Result	Result	Result	Result
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	**1.01**	**0.180**	**1.44**	**1.22**	**2.12**

Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)			Sample ID	2023072__059 EB2433615018	2023072__060 EB2433615019	2023072__061 EB2433615020	2023072__062 EB2433615021	2023072__063 EB2433615022
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2435907-006	EB2435907-007	EB2435907-008	EB2435907-009	EB2435907-010
				Result	Result	Result	Result	Result
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	**2.02**	**1.62**	**1.54**	**0.114**	**0.120**

Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)			Sample ID	2023072__064 EB2433615023	2023072__065 EB2433615024	2023072__066 EB2433615025	2023072__075 EB2433615034	2023072__076 EB2433615035
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2435907-011	EB2435907-012	EB2435907-013	EB2435907-014	EB2435907-015
				Result	Result	Result	Result	Result
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	**1.91**	**3.52**	**1.90**	**0.180**	**1.20**

Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)			Sample ID	2023072__080 EB2433615039	2023072__081 EB2433615040	2023072__082 EB2433615041	2023072__083 EB2433615042	2023072__084 EB2433615043
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2435907-016	EB2435907-017	EB2435907-018	EB2435907-019	EB2435907-020
				Result	Result	Result	Result	Result
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	**0.904**	**0.277**	**1.77**	**1.33**	**1.80**

Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)			Sample ID	2023072__085 EB2433615044	2023072__092 EB2433615051	2023072__093 EB2433615052	2023072__094 EB2433615053	2023072__096 EB2433615055
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2435907-021	EB2435907-022	EB2435907-023	EB2435907-024	EB2435907-025
				Result	Result	Result	Result	Result
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	**1.72**	**0.764**	**0.932**	**2.82**	**1.64**

Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)			Sample ID	2023072__097 EB2433615056	2023072__098 EB2433615057	2023072__110 EB2433615069	2023072__116 EB2433615075	2023072__117 EB2433615076
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2435907-026	EB2435907-027	EB2435907-028	EB2435907-029	EB2435907-030
				Result	Result	Result	Result	Result
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	**1.60**	**0.908**	**0.106**	**1.60**	**1.49**

Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)			Sample ID	2023072__118 EB2433615077	2023072__119 EB2433615078	2023072__120 EB2433615079	2023072__121 EB2433615080	2023072__122 EB2433615081
			Sampling date / time	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00	30-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	EB2435907-031	EB2435907-032	EB2435907-033	EB2435907-034	EB2435907-035
				Result	Result	Result	Result	Result
EA026 : Chromium Reducible Sulfur								
Chromium Reducible Sulphur	----	0.005	%	**1.99**	**1.94**	**0.685**	**1.34**	**2.02**

CERTIFICATE OF ANALYSIS

Work Order	: **EB2442745**	Page	: 1 of 6
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 3/30 LENSWORTH STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2023072 AARC Graphinex	Date Samples Received	: 05-Dec-2024 17:31
Order number	: ----	Date Analysis Commenced	: 11-Dec-2024
C-O-C number	: ----	Issue Date	: 16-Dec-2024 16:33
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 16		
No. of samples analysed	: 16		

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.

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, 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.

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C02 Overburden - Claystone	2023072_C03 Overburden - Sandstone	2023072_C04 Overburden - Siltstone	2023072_C05 Waste Rock - Dolerite + Metasediments	2023072_C06 Low Grade Ore - NAF-B
				Sampling date / time	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00
					EB2442745-002	EB2442745-003	EB2442745-004	EB2442745-005	EB2442745-006
					Result	Result	Result	Result	Result
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit		**6.5**	**7.1**	**6.3**	**8.1**	**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		**5.2**	<0.1	**3.0**	<0.1	<0.1

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C07 Low Grade Ore - PAF	2023072_C08 Ore Body - NAF-B/ NAF/ Uncertain	2023072_C09 Ore Body - PAF-LC/ Low Sulfur	2023072_C10 Ore Body - PAF/ Moderate Sulfur	2023072_C11 Ore Body - PAF/ High Sulfur
				Sampling date / time	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00
				EB2442745-007	EB2442745-008	EB2442745-009	EB2442745-010	EB2442745-011	
				Result	Result	Result	Result	Result	
EA011: Net Acid Generation									
pH (OX)	----	0.1	pH Unit	**2.8**	**3.9**	**2.9**	**2.6**	**2.6**	
NAG (pH 4.5)	----	0.1	kg H2SO4/t	**21.1**	**2.2**	**21.1**	**39.3**	**38.6**	
NAG (pH 7.0)	----	0.1	kg H2SO4/t	**30.9**	**5.4**	**29.0**	**48.4**	**45.3**	

Analytical Results

Sub-Matrix: PULP (Matrix: SOIL)			Sample ID	2023072_C101 Tailins Float #14	2023072_C102 Tailins Float #15	2023072_C103 Tailins Float #16	2023072_C104 Tailins Float #17	2023072_C105 Tailins Float #18
			Sampling date / time	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00	05-Dec-2024 00:00
Compound	CAS Number	LOR	Unit	EB2442745-012	EB2442745-013	EB2442745-014	EB2442745-015	EB2442745-016
				Result	Result	Result	Result	Result
EA011: Net Acid Generation								
pH (OX)	----	0.1	pH Unit	**2.7**	**2.7**	**2.7**	**2.7**	**2.6**
NAG (pH 4.5)	----	0.1	kg H2SO4/t	**31.8**	**35.7**	**32.7**	**29.4**	**32.4**
NAG (pH 7.0)	----	0.1	kg H2SO4/t	**43.2**	**43.0**	**39.9**	**39.8**	**42.7**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	2023072_C01 Soil	----	----	----	----
			Sampling date / time	05-Dec-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2442745-001	--------	--------	--------	--------
				Result	----	----	----	----
EA011: Net Acid Generation								
pH (OX)	----	0.1	pH Unit	**5.5**	**----**	**----**	**----**	**----**
NAG (pH 4.5)	----	0.1	kg H2SO4/t	<0.1	**----**	**----**	**----**	**----**
NAG (pH 7.0)	----	0.1	kg H2SO4/t	**26.3**	**----**	**----**	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **EB2438700**	Page	: 1 of 18
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 3/30 LENSWORTH STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2023072 AARC Graphinex - Stage 2	Date Samples Received	: 07-Nov-2024 15:45
Order number	: ----	Date Analysis Commenced	: 11-Nov-2024
C-O-C number	: ----	Issue Date	: 26-Nov-2024 12:09
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 12		
No. of samples analysed	: 12		

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

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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.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

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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.

- EK040T-P conducted by ALS Melbourne, NATA accreditation no. 825, site no 13778
- ED045G (Chloride): Sample 2023072_C10 (EB2438700-010) was diluted due to matrix interference. LOR adjusted accordingly.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for some samples due to analytes not quantified in this report.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C01 Soil	2023072_C02 Overburden: Claystone	2023072_C03 Overburden: Sandstone	2023072_C04 Overburden: Siltstone	2023072_C05 Waste Rock: Dolerite + Metasediments
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
					EB2438700-001	EB2438700-002	EB2438700-003	EB2438700-004	EB2438700-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.07	9.21	7.70	8.08	9.07
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		63	451	110	270	176
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	36	<1	<1	18
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		14	89	26	87	59
Total Alkalinity as CaCO3	----	1	mg/L		14	124	26	87	78
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		7	11	9	31	7
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		6	53	6	3	2
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	<1	<1	<1	<1
Magnesium	7439-95-4	1	mg/L		<1	<1	<1	<1	<1
Sodium	7440-23-5	1	mg/L		12	83	20	52	31
Potassium	7440-09-7	1	mg/L		<1	1	<1	2	10
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	0.21	0.15	0.14	0.37
Dysprosium	7429-91-6	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		0.001	0.037	0.055	0.086	0.010
Bismuth	7440-69-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Erbium	7440-52-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L		<0.05	0.07	0.38	0.60	0.21
Europium	7440-53-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C01 Soil	2023072_C02 Overburden: Claystone	2023072_C03 Overburden: Sandstone	2023072_C04 Overburden: Siltstone	2023072_C05 Waste Rock: Dolerite + Metasediments
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
					EB2438700-001	EB2438700-002	EB2438700-003	EB2438700-004	EB2438700-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Strontium	7440-24-6	0.001	mg/L		**0.004**	**0.001**	**0.006**	**0.022**	**0.015**
Barium	7440-39-3	0.001	mg/L		**0.009**	**0.003**	**0.102**	**0.394**	**0.339**
Gadolinium	7440-54-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	7440-32-6	0.01	mg/L		<0.01	<0.01	**0.02**	**0.01**	<0.01
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Gallium	7440-55-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	**0.003**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Hafnium	7440-58-6	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Tellurium	22541-49-7	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Holmium	7440-60-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Caesium	7440-46-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L		<0.001	**0.003**	**0.002**	<0.001	<0.001
Indium	7440-74-6	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		**0.006**	<0.001	<0.001	<0.001	<0.001
Lanthanum	7439-91-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Rubidium	7440-17-7	0.001	mg/L		<0.001	<0.001	<0.001	**0.002**	**0.016**
Lithium	7439-93-2	0.001	mg/L		**0.002**	**0.003**	**0.003**	**0.006**	**0.003**
Lutetium	7439-94-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cerium	7440-45-1	0.001	mg/L		**0.002**	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.002**	**0.001**	**0.017**	**0.006**	**0.001**
Neodymium	7440-00-8	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	<0.001
Molybdenum	7439-98-7	0.001	mg/L		**0.002**	**0.006**	**0.048**	**0.182**	**0.022**
Praseodymium	7440-10-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C01 Soil	2023072_C02 Overburden: Claystone	2023072_C03 Overburden: Sandstone	2023072_C04 Overburden: Siltstone	2023072_C05 Waste Rock: Dolerite + Metasediments
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
					EB2438700-001	EB2438700-002	EB2438700-003	EB2438700-004	EB2438700-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Nickel	7440-02-0	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	<0.001
Samarium	7440-19-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Terbium	7440-27-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		**0.002**	<0.001	**0.002**	**0.007**	**0.003**
Thulium	7440-30-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	**0.02**	<0.01
Ytterbium	7440-64-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Tin	7440-31-5	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Yttrium	7440-65-5	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Thallium	7440-28-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zirconium	7440-67-7	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.16**	**0.04**	**0.04**	**0.02**
Zinc	7440-66-6	0.005	mg/L		**0.026**	<0.005	**0.009**	**0.009**	**0.007**
Iron	7439-89-6	0.05	mg/L		<0.05	**0.12**	**0.14**	<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	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**7.8**	**3.4**	**3.6**	**1.4**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.59**	**4.20**	**0.88**	**2.47**	**1.76**
ø Total Cations	----	0.01	meq/L		**0.52**	**3.64**	**0.87**	**2.31**	**1.60**
ø Ionic Balance	----	0.01	%		**----**	**7.22**	**----**	**----**	**----**
EP071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		**90**	**70**	**60**	<50	**70**
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C01 Soil	2023072_C02 Overburden: Claystone	2023072_C03 Overburden: Sandstone	2023072_C04 Overburden: Siltstone	2023072_C05 Waste Rock: Dolerite + Metasediments
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
				EB2438700-001	EB2438700-002	EB2438700-003	EB2438700-004	EB2438700-005	
				Result	Result	Result	Result	Result	
EP071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	**90**	**70**	**60**	<50	**70**	
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C06 Low Grade Ore: NAF - B	2023072_C07 Low Grade Ore: PAF	2023072_C08 Ore Body: NAF - B/ NAF/ Unc	2023072_C09 Ore Body: PAF - LC/ Low S	2023072_C10 Ore Body: PAF/ Mod S
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
					EB2438700-006	EB2438700-007	EB2438700-008	EB2438700-009	EB2438700-010
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**8.62**	**7.17**	**8.28**	**7.62**	**7.60**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**128**	**417**	**198**	**416**	**154**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		**8**	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**43**	**43**	**65**	**71**	**35**
Total Alkalinity as CaCO3	----	1	mg/L		**51**	**43**	**65**	**71**	**35**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**4**	**150**	**27**	**124**	**25**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**3**	**6**	**5**	**9**	<100
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**4**	**52**	**8**	**60**	**11**
Magnesium	7439-95-4	1	mg/L		<1	**5**	<1	**4**	<1
Sodium	7440-23-5	1	mg/L		**17**	**12**	**27**	**10**	**10**
Potassium	7440-09-7	1	mg/L		**10**	**9**	**9**	**11**	**11**
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.26**	<0.01	**0.10**	<0.01	**0.06**
Dysprosium	7429-91-6	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		**0.138**	**0.001**	**0.036**	**0.002**	**0.001**
Bismuth	7440-69-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Erbium	7440-52-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L		**0.17**	**0.20**	**0.18**	**0.17**	**0.16**
Europium	7440-53-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C06 Low Grade Ore: NAF - B	2023072_C07 Low Grade Ore: PAF	2023072_C08 Ore Body: NAF - B/ NAF/ Unc	2023072_C09 Ore Body: PAF - LC/ Low S	2023072_C10 Ore Body: PAF/ Mod S
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
					EB2438700-006	EB2438700-007	EB2438700-008	EB2438700-009	EB2438700-010
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Strontium	7440-24-6	0.001	mg/L		**0.029**	**0.103**	**0.058**	**0.078**	**0.043**
Barium	7440-39-3	0.001	mg/L		**0.532**	**0.532**	**0.566**	**0.671**	**0.498**
Gadolinium	7440-54-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Titanium	7440-32-6	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Gallium	7440-55-3	0.001	mg/L		**0.003**	<0.001	**0.002**	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	**0.0002**	<0.0001	<0.0001	<0.0001
Hafnium	7440-58-6	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Tellurium	22541-49-7	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L		<0.001	**0.034**	<0.001	**0.001**	<0.001
Holmium	7440-60-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Caesium	7440-46-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Indium	7440-74-6	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Lanthanum	7439-91-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Rubidium	7440-17-7	0.001	mg/L		**0.020**	**0.026**	**0.021**	**0.030**	**0.030**
Lithium	7439-93-2	0.001	mg/L		**0.004**	**0.018**	**0.007**	**0.017**	**0.013**
Lutetium	7439-94-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cerium	7440-45-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.002**	**1.07**	**0.005**	**0.608**	**0.027**
Neodymium	7440-00-8	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	7439-98-7	0.001	mg/L		**0.006**	**0.002**	**0.038**	**0.005**	**0.007**
Praseodymium	7440-10-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C06 Low Grade Ore: NAF - B	2023072_C07 Low Grade Ore: PAF	2023072_C08 Ore Body: NAF - B/ NAF/ Unc	2023072_C09 Ore Body: PAF - LC/ Low S	2023072_C10 Ore Body: PAF/ Mod S
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
					EB2438700-006	EB2438700-007	EB2438700-008	EB2438700-009	EB2438700-010
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Nickel	7440-02-0	0.001	mg/L		<0.001	**0.048**	<0.001	**0.007**	<0.001
Samarium	7440-19-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Terbium	7440-27-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		**0.018**	**0.002**	**0.020**	**0.008**	**0.005**
Thulium	7440-30-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	**0.01**	<0.01	<0.01
Ytterbium	7440-64-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Tin	7440-31-5	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Yttrium	7440-65-5	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Thallium	7440-28-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zirconium	7440-67-7	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.010**	**0.226**	**0.032**	**0.230**	**0.060**
Iron	7439-89-6	0.05	mg/L		<0.05	<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	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**1.8**	**1.7**	**1.2**	**2.0**	**2.1**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**1.19**	**4.15**	**2.00**	**4.25**	**1.22**
ø Total Cations	----	0.01	meq/L		**1.19**	**3.76**	**1.80**	**4.04**	**1.26**
ø Ionic Balance	----	0.01	%		**----**	**4.97**	**----**	**2.59**	**----**
EP071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		**100**	**70**	**60**	**60**	**50**
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C06 Low Grade Ore: NAF - B	2023072_C07 Low Grade Ore: PAF	2023072_C08 Ore Body: NAF - B/ NAF/ Unc	2023072_C09 Ore Body: PAF - LC/ Low S	2023072_C10 Ore Body: PAF/ Mod S
				Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
					EB2438700-006	EB2438700-007	EB2438700-008	EB2438700-009	EB2438700-010
					Result	Result	Result	Result	Result
EP071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**100**	**70**	**60**	**60**	**50**
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	<100	<100	<100	<100

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)			Sample ID	2023072_C11 Ore Body: PAF/ High S	----	----	----	----
			Sampling date / time	07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2438700-011	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**6.81**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**128**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**11**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**11**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**27**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**11**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**6**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**1**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**9**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**9**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	----	----	----	----
Dysprosium	7429-91-6	0.001	mg/L	<0.001	----	----	----	----
Silver	7440-22-4	0.001	mg/L	<0.001	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Bismuth	7440-69-9	0.001	mg/L	<0.001	----	----	----	----
Erbium	7440-52-0	0.001	mg/L	<0.001	----	----	----	----
Boron	7440-42-8	0.05	mg/L	**0.15**	----	----	----	----
Europium	7440-53-1	0.001	mg/L	<0.001	----	----	----	----
Strontium	7440-24-6	0.001	mg/L	**0.035**	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	2023072_C11 Ore Body: PAF/ High S	----	----	----	----
				Sampling date / time	07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2438700-011	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Barium	7440-39-3	0.001	mg/L		**0.507**	----	----	----	----
Gadolinium	7440-54-2	0.001	mg/L		<0.001	----	----	----	----
Titanium	7440-32-6	0.01	mg/L		<0.01	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	----	----	----	----
Gallium	7440-55-3	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Hafnium	7440-58-6	0.01	mg/L		<0.01	----	----	----	----
Tellurium	22541-49-7	0.005	mg/L		<0.005	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.001	----	----	----	----
Holmium	7440-60-0	0.001	mg/L		<0.001	----	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.001	----	----	----	----
Caesium	7440-46-2	0.001	mg/L		<0.001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Indium	7440-74-6	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Lanthanum	7439-91-0	0.001	mg/L		<0.001	----	----	----	----
Rubidium	7440-17-7	0.001	mg/L		**0.022**	----	----	----	----
Lithium	7439-93-2	0.001	mg/L		**0.016**	----	----	----	----
Lutetium	7439-94-3	0.001	mg/L		<0.001	----	----	----	----
Thorium	7440-29-1	0.001	mg/L		<0.001	----	----	----	----
Cerium	7440-45-1	0.001	mg/L		<0.001	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.130**	----	----	----	----
Neodymium	7440-00-8	0.001	mg/L		<0.001	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		**0.004**	----	----	----	----
Praseodymium	7440-10-0	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)			Sample ID	2023072_C11 Ore Body: PAF/ High S	----	----	----	----
			Sampling date / time	07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2438700-011	--------	--------	--------	--------
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Samarium	7440-19-9	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Terbium	7440-27-9	0.001	mg/L	<0.001	----	----	----	----
Antimony	7440-36-0	0.001	mg/L	**0.002**	----	----	----	----
Thulium	7440-30-4	0.001	mg/L	<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Ytterbium	7440-64-4	0.001	mg/L	<0.001	----	----	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	----	----	----	----
Yttrium	7440-65-5	0.001	mg/L	<0.001	----	----	----	----
Thallium	7440-28-0	0.001	mg/L	<0.001	----	----	----	----
Zirconium	7440-67-7	0.005	mg/L	<0.005	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.066**	----	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**3.5**	----	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**1.09**	----	----	----	----
ø Total Cations	----	0.01	meq/L	**1.00**	----	----	----	----
EP071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction	----	50	µg/L	**60**	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	**60**	----	----	----	----
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	2023072_C11 Ore Body: PAF/ High S	----	----	----	----
				Sampling date / time	07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2438700-011	--------	--------	--------	--------
					Result	----	----	----	----
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	2023072_C01 Soil	2023072_C02 Overburden: Claystone	2023072_C03 Overburden: Sandstone	2023072_C04 Overburden: Siltstone	2023072_C05 Waste Rock: Dolerite + Metasediments
			Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
Compound	CAS Number	LOR	Unit	EB2438700-001	EB2438700-002	EB2438700-003	EB2438700-004	EB2438700-005
				Result	Result	Result	Result	Result
EK040T-P: Total Fluoride by Auto Analyser								
Fluoride	16984-48-8	40	mg/kg	<40	**150**	**200**	**280**	**330**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	2023072_C06 Low Grade Ore: NAF - B	2023072_C07 Low Grade Ore: PAF	2023072_C08 Ore Body: NAF - B/ NAF/ Unc	2023072_C09 Ore Body: PAF - LC/ Low S	2023072_C10 Ore Body: PAF/ Mod S
			Sampling date / time	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00	07-Nov-2024 00:00
Compound	CAS Number	LOR	Unit	EB2438700-006	EB2438700-007	EB2438700-008	EB2438700-009	EB2438700-010
				Result	Result	Result	Result	Result
EK040T-P: Total Fluoride by Auto Analyser								
Fluoride	16984-48-8	40	mg/kg	**510**	**240**	**420**	**580**	**550**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	2023072_C11 Ore Body: PAF/ High S	----	----	----	----
			Sampling date / time	07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2438700-011	--------	--------	--------	--------
				Result	----	----	----	----
EK040T-P: Total Fluoride by Auto Analyser								
Fluoride	16984-48-8	40	mg/kg	**580**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: SOIL)				Sample ID	Dummy sample for pH and EC	----	----	----	----
				Sampling date / time	07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2438700-012	--------	--------	--------	--------
					Result	----	----	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		**5.4**	**----**	**----**	**----**	**----**
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		<1	**----**	**----**	**----**	**----**

Inter-Laboratory Testing

Analysis conducted by ALS Melbourne, NATA accreditation no. 825, site no. 13778 (Chemistry).

(SOIL) EK040T-P: Total Fluoride by Auto Analyser

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To: **ALS ENVIRONMENTAL**
32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 26-NOV-2024
Account: ALSENV

CERTIFICATE BR24329140

Project: EB2438700

P.O. No.: ME-MS41

This report is for 11 samples of Pulp submitted to our lab in Brisbane, QLD, Australia on 15-NOV-2024.

The following have access to data associated with this certificate:

SUB RESULTS -BRIS		

SAMPLE PREPARATION

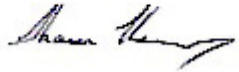
ALS CODE	DESCRIPTION
LOG-24	Pulp Login - Rcd w/o Barcode
LEV-01	Waste Disposal Levy

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-MS41	Ultra Trace Aqua Regia ICP-MS	

This is the Final Report and supersedes any preliminary report with this certificate number.Results apply to samples as submitted.All pages of this report have been checked and approved for release.
***** See Appendix Page for comments regarding this certificate *****

Signature:



Shaun Kenny, Brisbane Laboratory Manager

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32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 26-NOV-2024
Account: ALSENV

Project: EB2438700

CERTIFICATE OF ANALYSIS BR24329140

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm
	LOD	0.01	0.01	0.1	0.02	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05	0.2
EB2438700_001		0.03	0.31	1.7	<0.02	<10	30	0.15	0.04	0.09	<0.01	13.75	1.7	17	0.39	4.2
EB2438700_002		0.06	1.19	4.1	<0.02	<10	150	0.78	0.11	0.10	<0.01	26.5	34.9	21	2.01	25.2
EB2438700_003		0.04	1.01	6.1	<0.02	<10	140	0.78	0.09	0.12	0.03	28.3	13.6	22	2.32	11.3
EB2438700_004		0.13	2.09	5.9	<0.02	<10	60	2.06	0.34	0.22	0.18	75.9	20.3	16	5.37	29.8
EB2438700_005		0.08	2.00	1.6	<0.02	<10	60	1.87	0.17	0.56	0.06	92.6	12.9	21	6.83	39.9
EB2438700_006		0.19	1.92	16.4	<0.02	<10	30	1.36	0.17	0.71	0.45	105.0	14.7	15	6.36	39.3
EB2438700_007		0.20	1.36	31.9	<0.02	<10	30	0.59	0.16	0.25	0.79	87.4	27.6	15	1.29	140.5
EB2438700_008		0.36	2.30	26.2	<0.02	<10	40	1.53	0.24	0.97	0.97	89.7	22.4	28	4.62	119.0
EB2438700_009		0.27	1.49	39.2	<0.02	<10	30	0.93	0.37	0.43	0.30	75.5	24.6	17	2.36	194.5
EB2438700_010		0.23	1.30	40.8	<0.02	<10	30	0.90	0.25	0.35	0.36	65.0	26.8	15	2.32	206
EB2438700_011		0.28	1.25	43.3	<0.02	<10	20	0.69	0.26	0.33	0.33	59.2	38.6	13	1.68	267

***** See Appendix Page for comments regarding this certificate *****

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32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 26-NOV-2024
Account: ALSENV

Project: EB2438700

CERTIFICATE OF ANALYSIS BR24329140

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni
	Units	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm
	LOD	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5	0.05	0.01	0.05	0.2
EB2438700_001		0.93	1.36	<0.05	0.05	<0.01	0.009	0.02	6.0	1.4	0.06	65	0.74	0.02	0.07	5.5
EB2438700_002		1.70	4.42	0.07	0.23	<0.01	0.025	0.18	9.9	9.1	0.19	192	0.56	0.19	<0.05	11.8
EB2438700_003		1.82	4.08	0.10	0.17	0.01	0.024	0.21	12.0	11.5	0.23	986	1.16	0.11	0.06	18.2
EB2438700_004		3.78	10.05	0.14	0.25	0.02	0.092	0.28	28.9	35.2	0.39	1210	1.30	0.14	<0.05	18.3
EB2438700_005		4.29	9.34	0.13	0.17	<0.01	0.044	0.44	46.7	28.2	0.54	800	3.71	0.04	<0.05	23.2
EB2438700_006		4.33	11.25	0.17	0.29	<0.01	0.061	0.21	50.9	25.7	0.44	626	4.14	0.03	0.11	22.4
EB2438700_007		4.32	7.37	0.15	0.15	0.01	0.058	0.15	39.6	21.5	0.28	483	12.85	0.03	0.25	45.2
EB2438700_008		5.80	14.05	0.14	0.15	<0.01	0.084	0.22	44.0	48.5	0.64	760	11.65	0.04	0.05	56.7
EB2438700_009		4.76	8.44	0.15	0.20	<0.01	0.057	0.19	35.6	29.0	0.32	538	16.40	0.03	0.48	51.3
EB2438700_010		5.66	6.80	0.16	0.22	<0.01	0.051	0.18	30.4	27.5	0.23	472	22.5	0.03	0.93	56.8
EB2438700_011		6.78	6.53	0.17	0.20	<0.01	0.051	0.14	27.9	23.5	0.28	464	23.7	0.03	1.01	71.5

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Project: EB2438700

CERTIFICATE OF ANALYSIS BR24329140

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti	Tl
	Units	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm
	LOD	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005	0.02
EB2438700_001		30	3.3	3.9	<0.001	0.01	0.14	0.8	<0.2	0.3	5.8	<0.01	0.01	2.3	0.006	0.03
EB2438700_002		60	8.2	19.8	<0.001	0.01	0.18	3.3	<0.2	4.5	23.6	<0.01	0.01	4.7	0.009	0.14
EB2438700_003		160	7.1	18.1	<0.001	0.02	0.11	3.2	0.3	1.4	35.4	<0.01	0.01	4.5	0.011	0.20
EB2438700_004		340	26.9	27.6	0.007	0.06	0.17	9.8	0.3	1.8	40.0	<0.01	0.06	11.5	0.008	0.26
EB2438700_005		590	30.4	51.8	0.001	0.02	0.19	5.5	<0.2	1.4	19.2	<0.01	0.03	16.2	0.013	0.56
EB2438700_006		620	48.3	24.6	0.002	0.04	0.67	7.1	0.2	2.9	13.5	<0.01	0.08	19.2	0.042	0.24
EB2438700_007		500	43.0	14.5	0.004	1.06	0.59	6.6	0.8	1.5	6.8	0.01	0.19	17.9	0.032	0.18
EB2438700_008		930	40.0	25.3	0.007	0.12	0.62	8.5	0.4	4.5	14.7	<0.01	0.20	16.6	0.022	0.26
EB2438700_009		640	38.9	19.3	0.006	1.16	1.29	7.6	1.0	2.0	6.4	0.01	0.30	17.3	0.068	0.41
EB2438700_010		560	37.2	19.7	0.006	1.86	1.06	7.5	1.4	1.7	6.1	0.02	0.36	16.1	0.073	0.22
EB2438700_011		540	35.2	15.0	0.006	2.52	1.18	7.8	1.7	1.7	4.4	0.02	0.37	14.9	0.093	0.27

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STAFFORD QLD 4053

Finalized Date: 26-NOV-2024
Account: ALSENV

Project: EB2438700

CERTIFICATE OF ANALYSIS BR24329140

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	U	V	W	Y	Zn	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm
	LOD	0.05	1	0.05	0.05	2	0.5
EB2438700_001		0.33	15	0.35	2.58	43	2.0
EB2438700_002		0.61	40	0.64	7.49	25	8.6
EB2438700_003		0.47	27	0.86	7.36	40	5.4
EB2438700_004		1.30	51	<0.05	27.8	142	6.5
EB2438700_005		1.93	29	0.13	22.9	129	5.6
EB2438700_006		3.26	24	0.22	34.6	194	9.2
EB2438700_007		4.27	19	0.37	29.4	141	4.4
EB2438700_008		5.03	51	0.23	49.4	262	4.4
EB2438700_009		6.26	24	0.77	33.3	134	5.4
EB2438700_010		6.28	18	0.94	30.7	157	6.1
EB2438700_011		5.43	20	1.01	27.8	141	5.0

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Finalized Date: 26-NOV-2024
Account: ALSENV

Project: EB2438700

CERTIFICATE OF ANALYSIS BR24329140

CERTIFICATE COMMENTS

ANALYTICAL COMMENTS

Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5g).

Applies to Method: ME-MS41

ACCREDITATION COMMENTS

NATA Accreditation covers the performance of this service but does not cover the performance of ALS Brisbane Sample Preparation. Corporate Accreditation No: 825, Corporate Site No: 818. The Technical Signatory is David Jones,ICPMS Supervising Chemist

Applies to Method: ME-MS41

LABORATORY ADDRESSES

Processed at ALS Brisbane located at 32 Shand Street, Stafford, Brisbane, QLD, Australia. Processed at ALS Brisbane Sample Preparation at 23 Pineapple Street, Zillmere, QLD, 4034, Australia

Applies to Method: LEV-01 LOG-24 ME-MS41

CERTIFICATE OF ANALYSIS

Work Order	: **EB2435821**	Page	: 1 of 10
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 3/30 LENSWORTH STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2023072 AARC Graphinex - Stage 3	Date Samples Received	: 17-Oct-2024 14:53
Order number	: ----	Date Analysis Commenced	: 18-Oct-2024
C-O-C number	: ----	Issue Date	: 04-Nov-2024 13:44
Sampler	: Koshik Gounder		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Tatijana Markoska	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Vincent Muller	Chemist - Inorganics	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.

- Total Flouride analysis is conducted by ALS Melbourne, NATA accreditation no. 825, site no 13778
- EP071 – TRH Semivolatile Fraction: Sample 'Gladstone' (EB2436360_001) shows poor matrix spike recovery due to possible heterogeneity.
- ASS: EA013 (ANC) Fizz Rating: 0- None; 1- Slight; 2- Moderate; 3- Strong; 4- Very Strong; 5- Lime.
- EA058 Emerson: V. = Very, D. = Dark, L. = Light, VD. = Very Dark
- ALS is not NATA accredited for the analysis of bulk density in a soil matrix.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: LEACHATE
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C101 Master Comp P80 0.3mm Sighter Float #14	2023072_C102 Master Comp P80 0.3mm Sighter Float #15	2023072_C103 Master Comp P80 0.3mm Sighter Float #16	2023072_C104 Master Comp P80 0.3mm Sighter Float #17	2023072_C105 Master Comp P80 0.3mm Sighter Float #18
				Sampling date / time	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00
					EB2435821-001	EB2435821-002	EB2435821-003	EB2435821-004	EB2435821-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**22**	**26**	**27**	**28**	**27**
Total Alkalinity as CaCO3	----	1	mg/L		**22**	**26**	**27**	**28**	**27**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**21**	**30**	**31**	**40**	**22**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**14**	**16**	**14**	**13**	**18**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**13**	**18**	**16**	**20**	**14**
Magnesium	7439-95-4	1	mg/L		<1	**1**	<1	<1	<1
Sodium	7440-23-5	1	mg/L		**5**	**6**	**5**	**6**	**6**
Potassium	7440-09-7	1	mg/L		**3**	**3**	**3**	**3**	**3**
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.21**	**0.16**	**0.16**	**0.12**	**0.19**
Dysprosium	7429-91-6	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		**0.003**	**0.003**	**0.003**	**0.002**	**0.003**
Bismuth	7440-69-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Erbium	7440-52-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Europium	7440-53-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Strontium	7440-24-6	0.001	mg/L		**0.038**	**0.050**	**0.046**	**0.054**	**0.041**
Barium	7440-39-3	0.001	mg/L		**0.007**	**0.007**	**0.005**	**0.006**	**0.004**
Gadolinium	7440-54-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: LEACHATE
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C101 Master Comp P80 0.3mm Sighter Float #14	2023072_C102 Master Comp P80 0.3mm Sighter Float #15	2023072_C103 Master Comp P80 0.3mm Sighter Float #16	2023072_C104 Master Comp P80 0.3mm Sighter Float #17	2023072_C105 Master Comp P80 0.3mm Sighter Float #18
				Sampling date / time	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00
					EB2435821-001	EB2435821-002	EB2435821-003	EB2435821-004	EB2435821-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Titanium	7440-32-6	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Gallium	7440-55-3	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	**0.001**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Hafnium	7440-58-6	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Tellurium	22541-49-7	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Holmium	7440-60-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Caesium	7440-46-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Indium	7440-74-6	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Lanthanum	7439-91-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Rubidium	7440-17-7	0.001	mg/L		**0.008**	**0.009**	**0.009**	**0.010**	**0.008**
Lithium	7439-93-2	0.001	mg/L		**0.004**	**0.006**	**0.005**	**0.006**	**0.004**
Lutetium	7439-94-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cerium	7440-45-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.040**	**0.076**	**0.069**	**0.136**	**0.043**
Neodymium	7440-00-8	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	7439-98-7	0.001	mg/L		**0.003**	**0.004**	**0.003**	**0.003**	**0.004**
Praseodymium	7440-10-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Samarium	7440-19-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: LEACHATE
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C101 Master Comp P80 0.3mm Sighter Float #14	2023072_C102 Master Comp P80 0.3mm Sighter Float #15	2023072_C103 Master Comp P80 0.3mm Sighter Float #16	2023072_C104 Master Comp P80 0.3mm Sighter Float #17	2023072_C105 Master Comp P80 0.3mm Sighter Float #18
				Sampling date / time	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00
					EB2435821-001	EB2435821-002	EB2435821-003	EB2435821-004	EB2435821-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Terbium	7440-27-9	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Antimony	7440-36-0	0.001	mg/L		**0.042**	**0.002**	**0.002**	**0.002**	**0.002**
Thulium	7440-30-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Ytterbium	7440-64-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Tin	7440-31-5	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Yttrium	7440-65-5	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Thallium	7440-28-0	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Zirconium	7440-67-7	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Iron	7439-89-6	0.05	mg/L		<0.05	<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	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**1.2**	**1.0**	**1.2**	**1.2**	**1.2**
EP071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		**80**	**100**	**100**	**70**	**150**
C15 - C28 Fraction	----	100	µg/L		**140**	**230**	**150**	**140**	**240**
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**220**	**330**	**250**	**210**	**390**
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		**140**	**190**	**170**	**120**	**290**
>C16 - C34 Fraction	----	100	µg/L		<100	**140**	<100	<100	<100

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C101 Master Comp P80 0.3mm Sighter Float #14	2023072_C102 Master Comp P80 0.3mm Sighter Float #15	2023072_C103 Master Comp P80 0.3mm Sighter Float #16	2023072_C104 Master Comp P80 0.3mm Sighter Float #17	2023072_C105 Master Comp P80 0.3mm Sighter Float #18
				Sampling date / time	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00
					EB2435821-001	EB2435821-002	EB2435821-003	EB2435821-004	EB2435821-005
					Result	Result	Result	Result	Result
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		**140**	**330**	**170**	**120**	**290**

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C101 Master Comp P80 0.3mm Sighter Float #14	2023072_C102 Master Comp P80 0.3mm Sighter Float #15	2023072_C103 Master Comp P80 0.3mm Sighter Float #16	2023072_C104 Master Comp P80 0.3mm Sighter Float #17	2023072_C105 Master Comp P80 0.3mm Sighter Float #18
				Sampling date / time	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00
					EB2435821-001	EB2435821-002	EB2435821-003	EB2435821-004	EB2435821-005
					Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.7	8.5	8.6	8.4	8.7
EA009: Net Acid Production Potential									
Net Acid Production Potential	----	0.5	kg H2SO4/t		36.8	39.3	39.5	39.3	39.9
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		112	135	146	160	135
EA013: Acid Neutralising Capacity									
ANC as H2SO4	----	0.5	kg H2SO4 equiv./t		6.7	6.9	6.4	5.7	5.4
ANC as CaCO3	----	0.1	% CaCO3		0.7	0.7	0.6	0.6	0.6
Fizz Rating	----	0	Fizz Unit		0	0	0	0	0
EA026 : Chromium Reducible Sulfur									
Chromium Reducible Sulphur	----	0.005	%		1.42	1.49	1.50	1.46	1.48
EA051 : Bulk Density									
ø Bulk Density	BULK_DENSITY	1	kg/m3		1660	1600	1500	1510	1580
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-		Dark Gray (N 4/)	Dark Gray (N 4/)	Dark Gray (N 4/)	Dark Gray (N 4/)	Dark Gray (N 4/)
Texture	----	-	-		Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand	Clayey Sand
Emerson Class Number	EC/TC	-	-		3	3	3	3	3
EA150: Particle Sizing									
ø +2µm	----	1	%		95	95	90	95	94
ø +5µm	----	1	%		91	90	87	88	87
ø +10µm	----	1	%		87	84	82	84	85
ø +15.6µm	----	1	%		84	81	78	80	82
ø +20µm	----	1	%		81	79	76	77	78
ø +30µm	----	1	%		78	77	73	74	74
ø +40µm	----	1	%		76	74	71	70	71

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C101 Master Comp P80 0.3mm Sighter Float #14	2023072_C102 Master Comp P80 0.3mm Sighter Float #15	2023072_C103 Master Comp P80 0.3mm Sighter Float #16	2023072_C104 Master Comp P80 0.3mm Sighter Float #17	2023072_C105 Master Comp P80 0.3mm Sighter Float #18
				Sampling date / time	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00
					EB2435821-001	EB2435821-002	EB2435821-003	EB2435821-004	EB2435821-005
					Result	Result	Result	Result	Result
EA150: Particle Sizing - Continued									
ø +50µm	----	1	%		74	72	70	68	71
ø +60µm	----	1	%		73	70	69	67	71
+75µm	----	1	%		72	68	66	65	69
+150µm	----	1	%		48	46	47	44	49
+300µm	----	1	%		15	15	14	14	15
+425µm	----	1	%		3	3	3	2	3
+600µm	----	1	%		<1	<1	<1	<1	<1
+1180µm	----	1	%		<1	<1	<1	<1	<1
+2.36mm	----	1	%		<1	<1	<1	<1	<1
+4.75mm	----	1	%		<1	<1	<1	<1	<1
+9.5mm	----	1	%		<1	<1	<1	<1	<1
+19.0mm	----	1	%		<1	<1	<1	<1	<1
+37.5mm	----	1	%		<1	<1	<1	<1	<1
+75.0mm	----	1	%		<1	<1	<1	<1	<1
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		5	5	10	5	6
Silt (2-60 µm)	----	1	%		22	25	21	28	23
Sand (0.06-2.00 mm)	----	1	%		73	70	69	67	71
Gravel (>2mm)	----	1	%		<1	<1	<1	<1	<1
Cobbles (>6cm)	----	1	%		<1	<1	<1	<1	<1
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		2.71	2.69	2.75	2.63	2.69
ED042T: Total Sulfur by LECO									
Sulfur - Total as S (LECO)	----	0.01	%		1.42	1.51	1.50	1.47	1.48
EK040T-P: Total Fluoride by Auto Analyser									

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Sample ID	2023072_C101 Master Comp P80 0.3mm Sighter Float #14	2023072_C102 Master Comp P80 0.3mm Sighter Float #15	2023072_C103 Master Comp P80 0.3mm Sighter Float #16	2023072_C104 Master Comp P80 0.3mm Sighter Float #17	2023072_C105 Master Comp P80 0.3mm Sighter Float #18
				Sampling date / time	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00	17-Oct-2024 00:00
					EB2435821-001	EB2435821-002	EB2435821-003	EB2435821-004	EB2435821-005
					Result	Result	Result	Result	Result
EK040T-P: Total Fluoride by Auto Analyser - Continued									
Fluoride	16984-48-8	40	mg/kg		**740**	**540**	**520**	**470**	**840**
EP003TC: Total Carbon (TC) in Soil									
Total Carbon	TC	0.02	%		**0.95**	**1.50**	**1.50**	**0.88**	**2.11**

Analytical Results

Sub-Matrix: WATER (Matrix: SOIL)				Sample ID	Dummy Sample for pH and EC	----	----	----	----
				Sampling date / time	17-Oct-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2435821-006	--------	--------	--------	--------
					Result	----	----	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		**5.6**	**----**	**----**	**----**	**----**
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		<1	**----**	**----**	**----**	**----**

Inter-Laboratory Testing

Analysis conducted by ALS Melbourne, NATA accreditation no. 825, site no. 13778 (Chemistry).

(SOIL) EK040T-P: Total Fluoride by Auto Analyser

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ALS Brisbane is a NATA Accredited Testing Laboratory. Corporate Accreditation No: 825, Corporate Site No: 818.

To: **ALS ENVIRONMENTAL**
32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 4-NOV-2024
Account: ALSENV

CERTIFICATE BR24300382

Project: EB2435821

P.O. No.: ME-MS41

This report is for 5 samples of Pulp submitted to our lab in Brisbane, QLD, Australia on 23-OCT-2024.

The following have access to data associated with this certificate:

SUB RESULTS -BRIS		

SAMPLE PREPARATION

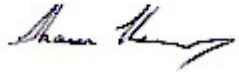
ALS CODE	DESCRIPTION
WEI-21b	Weight - Pulp
LOG-24	Pulp Login - Rcd w/o Barcode
LEV-01	Waste Disposal Levy

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-MS41	Ultra Trace Aqua Regia ICP-MS	

This is the Final Report and supersedes any preliminary report with this certificate number.Results apply to samples as submitted.All pages of this report have been checked and approved for release.
***** See Appendix Page for comments regarding this certificate *****

Signature:



Shaun Kenny, Brisbane Laboratory Manager

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To: ALS ENVIRONMENTAL
32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 4-NOV-2024
Account: ALSENV

Project: EB2435821

CERTIFICATE OF ANALYSIS BR24300382

Sample Description	Method	WEI-21b	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Pulp Wt	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs
	Units	g	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
	LOD	1	0.01	0.01	0.1	0.02	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05
EB2435821-001		40	0.21	1.13	28.1	<0.02	<10	20	0.86	0.26	0.36	0.46	65.5	26.9	236	2.55
EB2435821-002		35	0.23	1.25	28.7	<0.02	<10	20	0.92	0.23	0.38	0.44	63.0	27.3	228	2.69
EB2435821-003		45	0.22	1.22	27.4	<0.02	<10	20	0.91	0.24	0.37	0.45	65.7	26.8	221	2.69
EB2435821-004		29	0.22	1.24	26.4	<0.02	<10	30	0.92	0.23	0.37	0.44	63.7	26.7	174	2.72
EB2435821-005		45	0.23	1.26	27.1	<0.02	<10	20	0.92	0.23	0.38	0.44	64.0	26.9	187	2.74

***** See Appendix Page for comments regarding this certificate *****

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To: ALS ENVIRONMENTAL
32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 4-NOV-2024
Account: ALSENV

Project: EB2435821

CERTIFICATE OF ANALYSIS BR24300382

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na	Nb
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm
	LOD	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5	0.05	0.01	0.05
EB2435821-001		147.0	4.87	6.24	0.19	0.21	<0.01	0.055	0.14	30.3	23.5	0.23	496	31.4	0.03	0.84
EB2435821-002		176.0	5.25	6.78	0.18	0.21	<0.01	0.056	0.14	29.9	26.4	0.25	510	34.5	0.03	0.75
EB2435821-003		169.5	5.05	6.71	0.18	0.22	<0.01	0.058	0.13	31.1	26.1	0.25	475	34.5	0.03	0.76
EB2435821-004		159.0	5.04	6.76	0.18	0.22	<0.01	0.057	0.14	30.0	25.9	0.25	466	24.4	0.03	0.79
EB2435821-005		173.5	5.25	6.91	0.19	0.21	<0.01	0.056	0.13	30.6	26.8	0.26	484	31.4	0.03	0.80

***** See Appendix Page for comments regarding this certificate *****

Australian Laboratory Services Pty. Ltd.

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Phone: +61 7 3243 7222 Fax: +61 7 3243 7218
www.alsglobal.com/geochemistry

ALS Brisbane is a NATA Accredited Testing Laboratory. Corporate Accreditation No: 825, Corporate Site No: 818.

To: **ALS ENVIRONMENTAL**
32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 4-NOV-2024
Account: ALSENV

Project: EB2435821

CERTIFICATE OF ANALYSIS BR24300382

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti
	Units	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOD	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005
EB2435821-001		183.5	540	38.1	15.9	0.007	1.54	0.92	5.6	1.1	1.8	5.7	0.02	0.24	15.5	0.052
EB2435821-002		184.0	560	38.2	16.2	0.006	1.57	0.88	5.9	1.2	1.9	5.9	0.02	0.26	15.4	0.055
EB2435821-003		178.5	560	36.6	15.9	0.008	1.53	0.85	6.0	1.1	1.9	5.9	0.02	0.24	15.7	0.054
EB2435821-004		149.5	550	38.2	17.0	0.005	1.54	0.88	5.9	1.2	1.8	5.9	0.02	0.22	15.6	0.055
EB2435821-005		159.5	550	37.3	16.0	0.006	1.60	0.89	6.0	1.2	1.9	5.9	0.02	0.26	15.4	0.058

***** See Appendix Page for comments regarding this certificate *****

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To: ALS ENVIRONMENTAL
32 SHAND STREET
STAFFORD QLD 4053

Project: EB2435821

CERTIFICATE OF ANALYSIS BR24300382

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Tl	U	V	W	Y	Zn	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOD	0.02	0.05	1	0.05	0.05	2	0.5
EB2435821-001		0.26	4.72	19	1.62	28.6	166	5.2
EB2435821-002		0.28	4.87	21	1.62	28.6	175	5.3
EB2435821-003		0.26	4.86	21	1.67	29.3	170	5.3
EB2435821-004		0.26	4.76	20	1.33	28.8	170	5.3
EB2435821-005		0.27	4.83	21	1.46	29.0	173	5.4

***** See Appendix Page for comments regarding this certificate *****

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To: ALS ENVIRONMENTAL
32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 4-NOV-2024
Account: ALSENV

Project: EB2435821

CERTIFICATE OF ANALYSIS BR24300382

CERTIFICATE COMMENTS

ANALYTICAL COMMENTS

Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5g).

Applies to Method: ME-MS41

ACCREDITATION COMMENTS

NATA Accreditation covers the performance of this service but does not cover the performance of ALS Brisbane Sample Preparation. Corporate Accreditation No: 825, Corporate Site No: 818. The Technical Signatory is David Jones,ICPMS Supervising Chemist

Applies to Method: ME-MS41

LABORATORY ADDRESSES

Processed at ALS Brisbane located at 32 Shand Street, Stafford, Brisbane, QLD, Australia. Processed at ALS Brisbane Sample Preparation at 23 Pineapple Street, Zillmere, QLD, 4034, Australia

Applies to Method: LEV-01 LOG-24 ME-MS41 WEI-21b

Certificate of Analysis

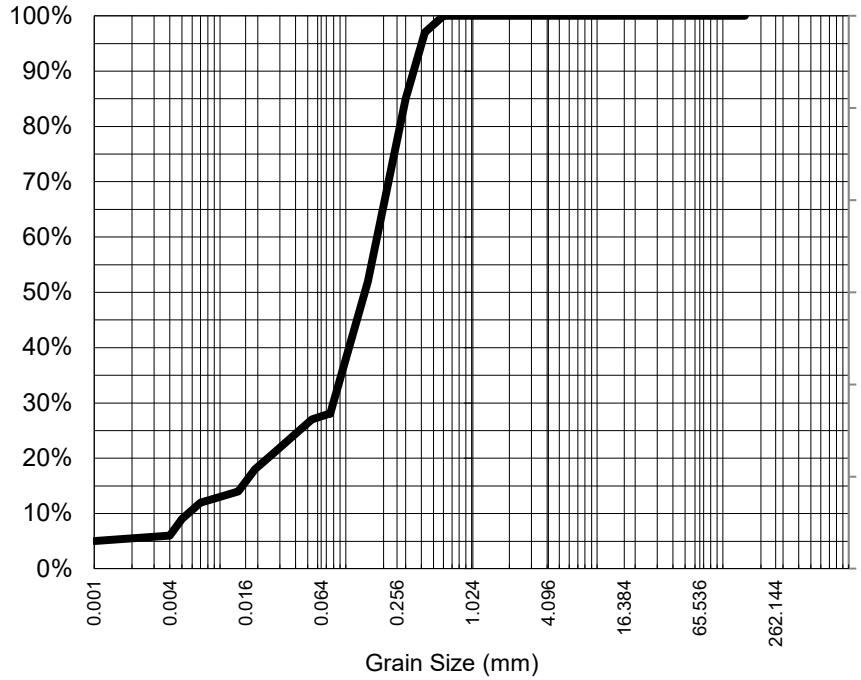
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ALS Environmental

Brisbane QLD

CLIENT:	MELINDA HILTON	**DATE REPORTED:**	30-Oct-2024
COMPANY:	RGS ENVIRONMENTAL CONSULTANTS PTY LTD	**DATE RECEIVED:**	17-Oct-2024
ADDRESS:	3/30 Lensworth Street Coopers Plains	**REPORT NO:**	EB2435821-001 / PSD
PROJECT:	2023072 AARC Graphinex - Stage 3	**SAMPLE ID:**	2023072_C101

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	97%
0.300	85%
0.150	52%
0.075	28%
Particle Size (microns)	
54	27%
38	24%
27	21%
19	18%
14	14%
10	13%
7	12%
5	9%
1	5%

Median Particle Size (mm)*	0.144

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 28-Oct-24

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.71

NATA Accreditation: 825 Site: Brisbane
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Satish Trivedi
Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

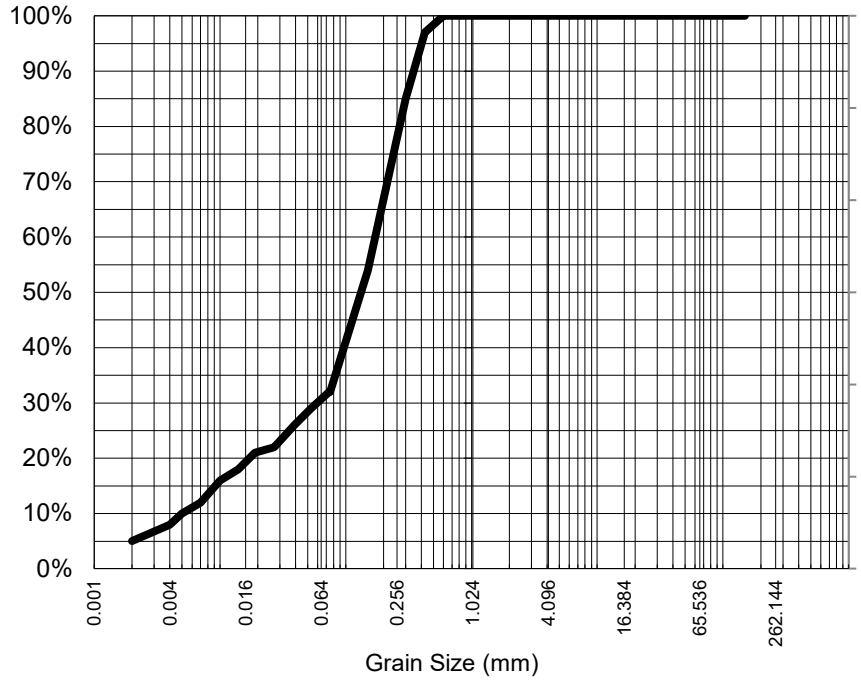
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Brisbane QLD

CLIENT:	MELINDA HILTON	**DATE REPORTED:**	30-Oct-2024
COMPANY:	RGS ENVIRONMENTAL CONSULTANTS PTY LTD	**DATE RECEIVED:**	17-Oct-2024
ADDRESS:	3/30 Lensworth Street Coopers Plains	**REPORT NO:**	EB2435821-002 / PSD
PROJECT:	2023072 AARC Graphinex - Stage 3	**SAMPLE ID:**	2023072_C102

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	97%
0.300	85%
0.150	54%
0.075	32%
Particle Size (microns)	
53	29%
39	26%
27	22%
19	21%
14	18%
10	16%
7	12%
5	10%
2	5%

Median Particle Size (mm)*	0.136

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 28-Oct-24

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.69

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Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

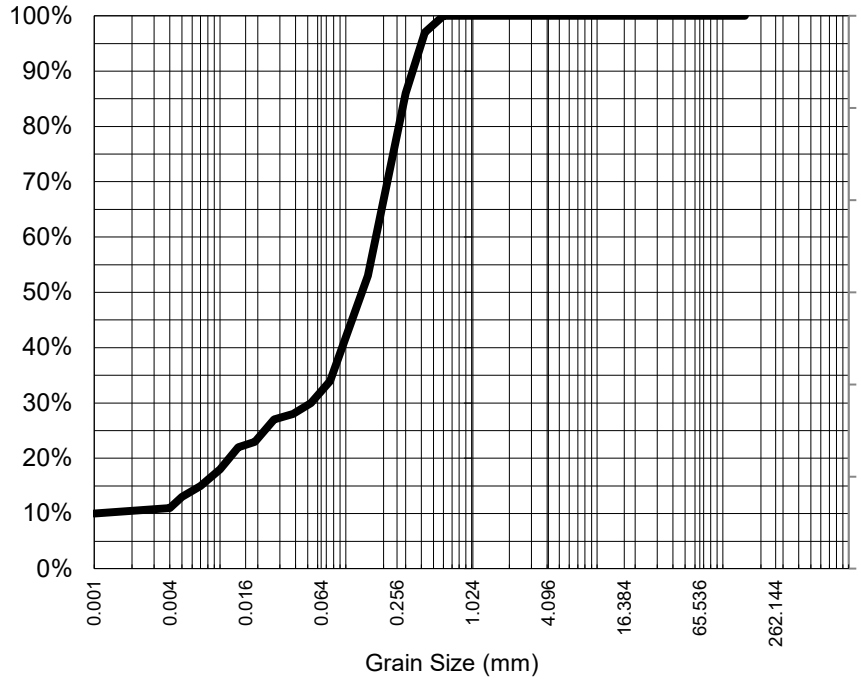
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CLIENT:	MELINDA HILTON	**DATE REPORTED:**	30-Oct-2024
COMPANY:	RGS ENVIRONMENTAL CONSULTANTS PTY LTD	**DATE RECEIVED:**	17-Oct-2024
ADDRESS:	3/30 Lensworth Street Coopers Plains	**REPORT NO:**	EB2435821-003 / PSD
PROJECT:	2023072 AARC Graphinex - Stage 3	**SAMPLE ID:**	2023072_C103

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	97%
0.300	86%
0.150	53%
0.075	34%
Particle Size (microns)	
53	30%
38	28%
27	27%
19	23%
14	22%
10	18%
7	15%
5	13%
1	10%

Median Particle Size (mm)*	0.138

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 28-Oct-24

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.75

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Satish Trivedi
Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

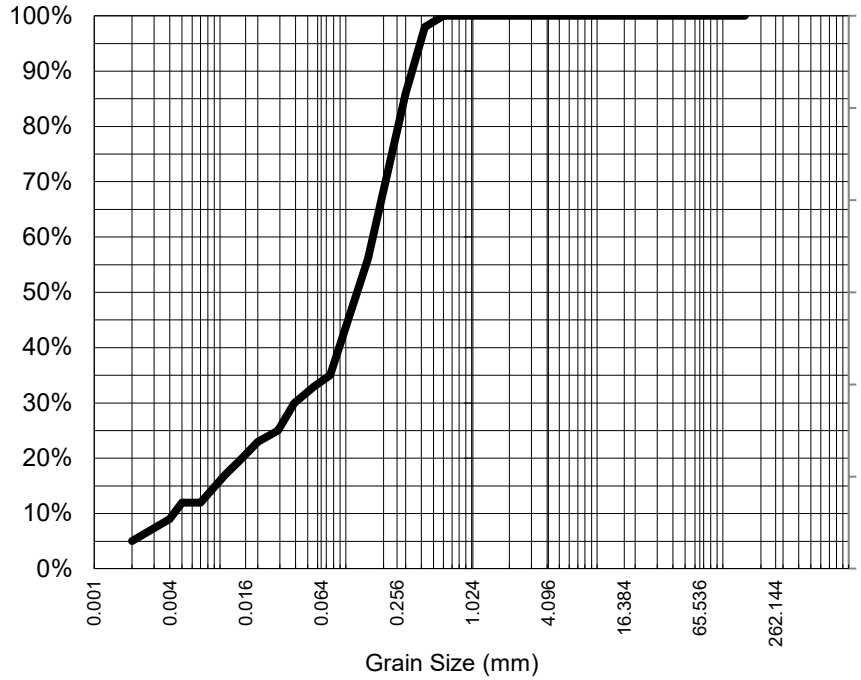
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CLIENT:	MELINDA HILTON	**DATE REPORTED:**	30-Oct-2024
COMPANY:	RGS ENVIRONMENTAL CONSULTANTS PTY LTD	**DATE RECEIVED:**	17-Oct-2024
ADDRESS:	3/30 Lensworth Street Coopers Plains	**REPORT NO:**	EB2435821-004 / PSD
PROJECT:	2023072 AARC Graphinex - Stage 3	**SAMPLE ID:**	2023072_C104

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	98%
0.300	86%
0.150	56%
0.075	35%
Particle Size (microns)	
56	33%
39	30%
29	25%
20	23%
15	20%
11	17%
7	12%
5	12%
2	5%

Median Particle Size (mm)*	0.129

Analysis Notes

Samples analysed as received.

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 28-Oct-24

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.63

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Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

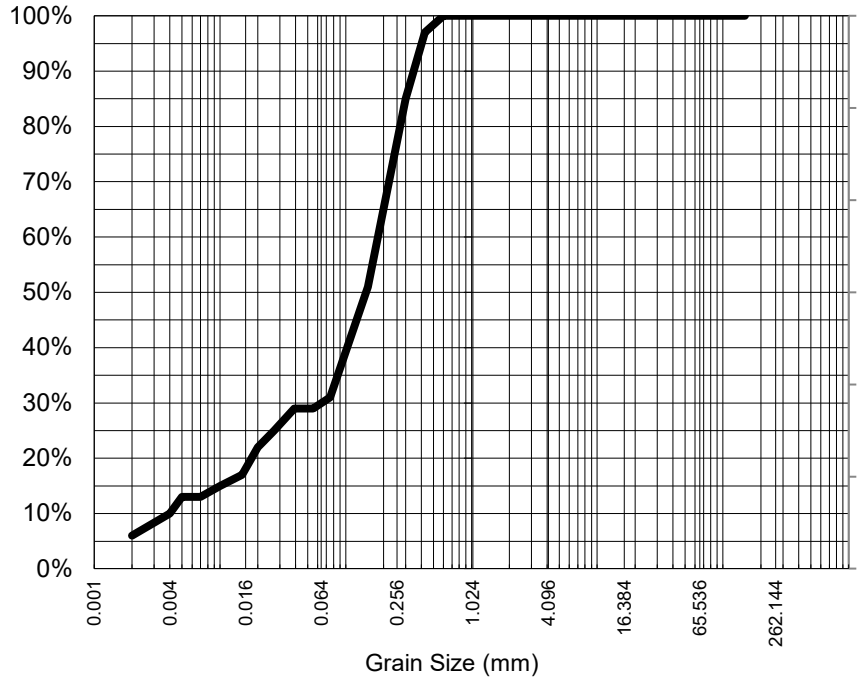
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Brisbane QLD

CLIENT:	MELINDA HILTON	**DATE REPORTED:**	30-Oct-2024
COMPANY:	RGS ENVIRONMENTAL CONSULTANTS PTY LTD	**DATE RECEIVED:**	17-Oct-2024
ADDRESS:	3/30 Lensworth Street Coopers Plains	**REPORT NO:**	EB2435821-005 / PSD
PROJECT:	2023072 AARC Graphinex - Stage 3	**SAMPLE ID:**	2023072_C105

Particle Size Distribution



Particle Size (mm)	% Passing
0.600	100%
0.425	97%
0.300	85%
0.150	51%
0.075	31%
Particle Size (microns)	
55	29%
39	29%
27	25%
20	22%
15	17%
10	15%
7	13%
5	13%
2	6%

Median Particle Size (mm)*	0.146

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Analysis Notes

Samples analysed as received.

Sample Comments:

Analysed: 28-Oct-24

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.69

NATA Accreditation: 825 Site: Brisbane
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WORLD RECOGNISED ACCREDITATION

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

CERTIFICATE OF ANALYSIS

Work Order	: **EB2512414**	Page	: 1 of 8
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 10-Apr-2025 16:20
Order number	: ----	Date Analysis Commenced	: 11-Apr-2025
C-O-C number	: ----	Issue Date	: 23-Apr-2025 16:20
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EN/222		
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.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Soil Preparation, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Tatijana Markoska	Senior Chemist - Organics	Brisbane Organics, 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.

- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EA058 Emerson: V. = Very, D. = Dark, L. = Light, VD. = Very Dark
- ALS is not NATA accredited for the analysis of bulk density in a soil matrix.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	2024066_001 Tailings Solid - Tank 1	2024066_002 Tailings Solid - Tank 2	2024066_003 Tailings Solid - Tank 3	----	----
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2512414-001	EB2512414-002	EB2512414-003	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**31**	**29**	**30**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**31**	**29**	**30**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**122**	**95**	**112**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**34**	**35**	**24**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**50**	**44**	**48**	----	----
Magnesium	7439-95-4	1	mg/L		**5**	**4**	**4**	----	----
Sodium	7440-23-5	1	mg/L		**7**	**6**	**6**	----	----
Potassium	7440-09-7	1	mg/L		**6**	**6**	**6**	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.07**	**0.07**	**0.07**	----	----
Dysprosium	7429-91-6	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Bismuth	7440-69-9	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Erbium	7440-52-0	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Boron	7440-42-8	0.05	mg/L		**0.11**	**0.08**	**0.07**	----	----
Europium	7440-53-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Strontium	7440-24-6	0.001	mg/L		**0.118**	**0.110**	**0.116**	----	----
Barium	7440-39-3	0.001	mg/L		**0.054**	**0.048**	**0.043**	----	----
Gadolinium	7440-54-2	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Titanium	7440-32-6	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	2024066_001 Tailings Solid - Tank 1	2024066_002 Tailings Solid - Tank 2	2024066_003 Tailings Solid - Tank 3	----	----
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2512414-001	EB2512414-002	EB2512414-003	--------	--------
					Result	Result	Result	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Gallium	7440-55-3	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
Hafnium	7440-58-6	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Tellurium	22541-49-7	0.005	mg/L		<0.005	<0.005	<0.005	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Holmium	7440-60-0	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Caesium	7440-46-2	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Indium	7440-74-6	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Lanthanum	7439-91-0	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Rubidium	7440-17-7	0.001	mg/L		**0.017**	**0.020**	**0.019**	----	----
Lithium	7439-93-2	0.001	mg/L		**0.003**	**0.002**	**0.003**	----	----
Lutetium	7439-94-3	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Cerium	7440-45-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L		**0.056**	**0.049**	**0.074**	----	----
Neodymium	7440-00-8	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Molybdenum	7439-98-7	0.001	mg/L		**0.004**	**0.005**	**0.004**	----	----
Praseodymium	7440-10-0	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Samarium	7440-19-9	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Terbium	7440-27-9	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Antimony	7440-36-0	0.001	mg/L		**0.001**	**0.001**	**0.001**	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	2024066_001 Tailings Solid - Tank 1	2024066_002 Tailings Solid - Tank 2	2024066_003 Tailings Solid - Tank 3	----	----
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2512414-001	EB2512414-002	EB2512414-003	--------	--------
					Result	Result	Result	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Thulium	7440-30-4	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Ytterbium	7440-64-4	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Tin	7440-31-5	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Yttrium	7440-65-5	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Thallium	7440-28-0	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Zirconium	7440-67-7	0.005	mg/L		<0.005	<0.005	<0.005	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	----	----
Iron	7439-89-6	0.05	mg/L		<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	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**1.2**	**1.3**	**1.3**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.12**	**3.54**	**3.61**	----	----
ø Total Cations	----	0.01	meq/L		**3.36**	**2.94**	**3.14**	----	----
ø Ionic Balance	----	0.01	%		**10.1**	**9.34**	**6.96**	----	----
EP071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		**80**	**60**	<50	----	----
C15 - C28 Fraction	----	100	µg/L		**280**	**280**	**220**	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**360**	**340**	**220**	----	----
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		**190**	**190**	**120**	----	----
>C16 - C34 Fraction	----	100	µg/L		**170**	**150**	**130**	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	2024066_001 Tailings Solid - Tank 1	2024066_002 Tailings Solid - Tank 2	2024066_003 Tailings Solid - Tank 3	----	----
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2512414-001	EB2512414-002	EB2512414-003	--------	--------
					Result	Result	Result	----	----
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		**360**	**340**	**250**	**----**	**----**

Analytical Results

Sub-Matrix: TAILINGS (Matrix: SOIL)				Sample ID	2024066_001 Tailings Solid - Tank 1	2024066_002 Tailings Solid - Tank 2	2024066_003 Tailings Solid - Tank 3	----	----
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2512414-001	EB2512414-002	EB2512414-003	--------	--------
					Result	Result	Result	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		8.2	8.4	8.3	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		397	333	394	----	----
EA026 : Chromium Reducible Sulfur									
Chromium Reducible Sulphur	----	0.005	%		1.80	0.608	1.80	----	----
EA051 : Bulk Density									
ø Bulk Density	BULK_DENSITY	1	kg/m3		1440	1420	1410	----	----
EA058: Emerson Aggregate Test									
Color (Munsell)	----	-	-		Black (5Y 2.5/1)	Dark Grayish Green (5GY 4/2)	Dark Greenish Gray (10Y 4/1)	----	----
Texture	----	-	-		Sandy Loam	Sandy Loam	Sandy Loam	----	----
Emerson Class Number	EC/TC	-	-		4	4	4	----	----
EA150: Particle Sizing									
ø +2µm	----	1	%		85	84	84	----	----
ø +5µm	----	1	%		81	80	80	----	----
ø +10µm	----	1	%		75	74	76	----	----
ø +15.6µm	----	1	%		72	71	72	----	----
ø +20µm	----	1	%		69	69	70	----	----
ø +30µm	----	1	%		62	62	63	----	----
ø +40µm	----	1	%		54	57	55	----	----
ø +50µm	----	1	%		50	54	49	----	----
ø +60µm	----	1	%		48	49	47	----	----
+75µm	----	1	%		47	44	46	----	----
+150µm	----	1	%		8	6	7	----	----
+300µm	----	1	%		1	<1	<1	----	----
+425µm	----	1	%		<1	<1	<1	----	----
+600µm	----	1	%		<1	<1	<1	----	----

Analytical Results

Sub-Matrix: TAILINGS (Matrix: SOIL)				Sample ID	2024066_001 Tailings Solid - Tank 1	2024066_002 Tailings Solid - Tank 2	2024066_003 Tailings Solid - Tank 3	----	----
				Sampling date / time	10-Apr-2025 00:00	10-Apr-2025 00:00	10-Apr-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2512414-001	EB2512414-002	EB2512414-003	--------	--------
					Result	Result	Result	----	----
EA150: Particle Sizing - Continued									
+1180µm	----	1	%		<1	<1	<1	----	----
+2.36mm	----	1	%		<1	<1	<1	----	----
+4.75mm	----	1	%		<1	<1	<1	----	----
+9.5mm	----	1	%		<1	<1	<1	----	----
+19.0mm	----	1	%		<1	<1	<1	----	----
+37.5mm	----	1	%		<1	<1	<1	----	----
+75.0mm	----	1	%		<1	<1	<1	----	----
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		**15**	**16**	**16**	----	----
Silt (2-60 µm)	----	1	%		**37**	**35**	**37**	----	----
Sand (0.06-2.00 mm)	----	1	%		**47**	**49**	**47**	----	----
Gravel (>2mm)	----	1	%		**1**	<1	<1	----	----
Cobbles (>6cm)	----	1	%		<1	<1	<1	----	----
EA152: Soil Particle Density									
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		**2.87**	**2.79**	**2.75**	----	----
EK040T-P: Total Fluoride by Auto Analyser									
Fluoride	16984-48-8	40	mg/kg		**550**	**580**	**580**	----	----
EN40: DI 1:5 Leachate									
ø Ratio	----	-	-		**1:5**	**1:5**	**1:5**	----	----
ø Tumble Time	----	-	hours		**16**	**16**	**16**	----	----
ø Filter Size	----	-	microns		**0.45**	**0.45**	**0.45**	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Melbourne, NATA accreditation no. 825, site no. 13778 (Chemistry).

(SOIL) EK040T-P: Total Fluoride by Auto Analyser

Australian Laboratory Services Pty. Ltd.

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To: **ALS ENVIRONMENTAL**
32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 17-APR-2025
Account: ALSENV

CERTIFICATE BR25106197

Project: EB2512414

P.O. No.: ME-MS41

This report is for 3 samples of Pulp submitted to our lab in Brisbane, QLD, Australia on 14-APR-2025.

The following have access to data associated with this certificate:

SUB RESULTS -BRIS		

SAMPLE PREPARATION

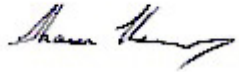
ALS CODE	DESCRIPTION
WEI-21b	Weight - Pulp
LEV-01	Waste Disposal Levy
LOG-24	Pulp Login - Rcd w/o Barcode

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	INSTRUMENT
ME-MS41	Ultra Trace Aqua Regia ICP-MS	

This is the Final Report and supersedes any preliminary report with this certificate number.Results apply to samples as submitted.All pages of this report have been checked and approved for release.
***** See Appendix Page for comments regarding this certificate *****

Signature:



Shaun Kenny, Brisbane Laboratory Manager

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To: ALS ENVIRONMENTAL
32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 17-APR-2025
Account: ALSENV

Project: EB2512414

CERTIFICATE OF ANALYSIS BR25106197

Sample Description	Method	WEI-21b	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Pulp Wt	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs
	Units	g	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
	LOD	1	0.01	0.01	0.1	0.02	10	10	0.05	0.01	0.01	0.01	0.02	0.1	1	0.05
EB2512414_001		15	0.27	1.31	24.8	<0.02	<10	60	0.88	0.22	0.49	0.38	60.8	31.4	24	2.28
EB2512414_002		16	0.25	1.28	23.8	<0.02	<10	60	0.86	0.21	0.49	0.41	57.8	30.0	24	2.21
EB2512414_003		14	0.26	1.32	22.6	<0.02	<10	60	0.88	0.21	0.48	0.39	57.9	30.4	27	2.25

***** See Appendix Page for comments regarding this certificate *****

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32 SHAND STREET
STAFFORD QLD 4053

Finalized Date: 17-APR-2025
Account: ALSENV

Project: EB2512414

CERTIFICATE OF ANALYSIS BR25106197

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na	Nb
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm
	LOD	0.2	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.2	0.1	0.01	5	0.05	0.01	0.05
EB2512414_001		137.5	5.86	6.71	0.16	0.21	<0.01	0.054	0.20	27.7	22.9	0.26	494	2.48	0.03	0.71
EB2512414_002		136.5	5.82	6.39	0.17	0.22	<0.01	0.052	0.18	26.5	22.6	0.25	491	2.34	0.03	0.74
EB2512414_003		125.0	5.87	6.55	0.14	0.23	<0.01	0.051	0.21	27.5	22.7	0.25	485	2.26	0.03	0.69

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CERTIFICATE OF ANALYSIS BR25106197

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te	Th	Ti
	Units	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOD	0.2	10	0.2	0.1	0.001	0.01	0.05	0.1	0.2	0.2	0.2	0.01	0.01	0.2	0.005
EB2512414_001		68.2	570	32.6	20.7	0.001	1.86	1.08	6.6	1.3	2.0	12.0	0.01	0.19	12.6	0.059
EB2512414_002		67.4	570	32.0	18.7	0.002	1.90	1.00	6.2	1.2	1.9	11.1	0.02	0.19	12.8	0.060
EB2512414_003		68.1	560	32.3	21.0	0.001	1.92	1.02	6.4	1.3	1.9	11.4	0.02	0.19	12.8	0.060

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Project: EB2512414

CERTIFICATE OF ANALYSIS BR25106197

Sample Description	Method	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41	ME-MS41
	Analyte	Tl	U	V	W	Y	Zn	Zr
	Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	LOD	0.02	0.05	1	0.05	0.05	2	0.5
EB2512414_001		0.35	4.00	21	0.60	27.6	157	6.1
EB2512414_002		0.32	4.08	21	0.59	26.8	161	5.7
EB2512414_003		0.35	4.00	21	0.58	27.2	155	6.0

***** See Appendix Page for comments regarding this certificate *****

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Finalized Date: 17-APR-2025
Account: ALSENV

Project: EB2512414

CERTIFICATE OF ANALYSIS BR25106197

CERTIFICATE COMMENTS

ANALYTICAL COMMENTS

Gold determinations by this method are semi-quantitative due to the small sample weight used (0.5g).

Applies to Method: ME-MS41

ACCREDITATION COMMENTS

NATA Accreditation covers the performance of this service but does not cover the performance of ALS Brisbane Sample Preparation. Corporate Accreditation No: 825, Corporate Site No: 818. The Technical Signatory is David Jones,ICPMS Supervising Chemist

Applies to Method: ME-MS41

LABORATORY ADDRESSES

Processed at ALS Brisbane located at 32 Shand Street, Stafford, Brisbane, QLD, Australia. Processed at ALS Brisbane Sample Preparation at 23 Pineapple Street, Zillmere, QLD, 4034, Australia

Applies to Method: LEV-01 LOG-24 ME-MS41 WEI-21b

Certificate of Analysis

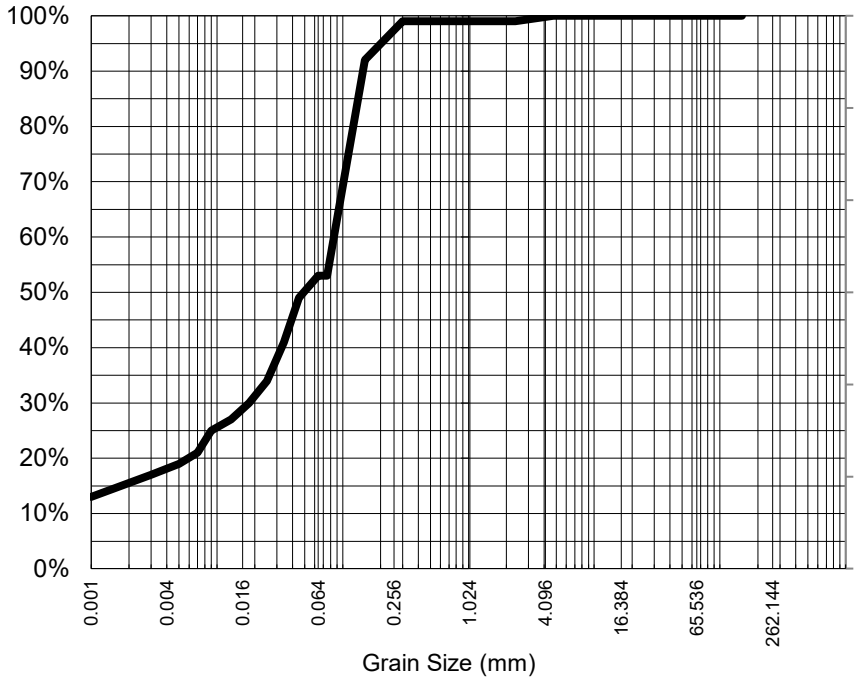
ALS Laboratory Group Pty Ltd
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Stafford, QLD 4053
pH 07 3243 7222
samples.brisbane@alsenviro.com

ALS Environmental

Brisbane QLD

CLIENT:	MELINDA HILTON	**DATE REPORTED:**	16-Apr-2025
COMPANY:	RGS ENVIRONMENTAL CONSULTANTS PTY LTD	**DATE RECEIVED:**	10-Apr-2025
ADDRESS:	45 Rosedale Street Coopers Plains	**REPORT NO:**	EB2512414-001 / PSD
PROJECT:	2024066 AARC Graphinex KLC's - Stage 4	**SAMPLE ID:**	2024066_001

Particle Size Distribution



Particle Size (mm)	% Passing
4.75	100%
2.36	99%
1.18	99%
0.600	99%
0.425	99%
0.300	99%
0.150	92%
0.075	53%
Particle Size (microns)	
45	49%
34	41%
25	34%
18	30%
13	27%
9	25%
7	21%
5	19%
1	13%

Median Particle Size (mm)*	0.050

Analysis Notes

Samples analysed as received.

** Soil Particle Density results fell outside the scope of AS 1289.3.6.3. Typical sediment SPD values used for calculations and consequently, NATA endorsement does not apply to hydrometer results*

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Sample Comments:

Analysed: 12-Apr-25

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.87 (2.85)*

NATA Accreditation: 825 Site: Brisbane
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NATA
WORLD RECOGNISED ACCREDITATION

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

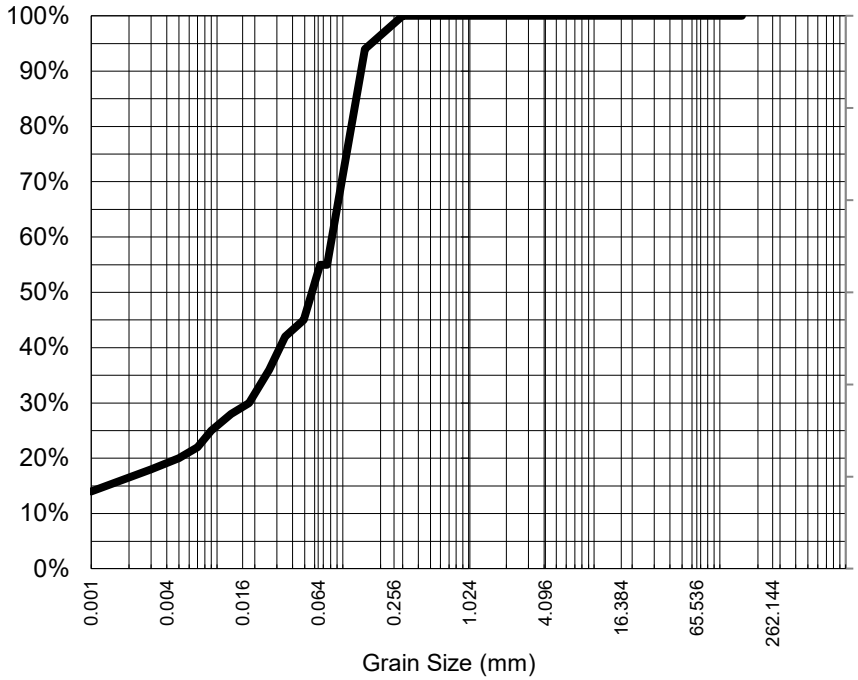
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ALS Environmental

Brisbane QLD

CLIENT:	MELINDA HILTON	**DATE REPORTED:**	16-Apr-2025
COMPANY:	RGS ENVIRONMENTAL CONSULTANTS PTY LTD	**DATE RECEIVED:**	10-Apr-2025
ADDRESS:	45 Rosedale Street Coopers Plains	**REPORT NO:**	EB2512414-002 / PSD
PROJECT:	2024066 AARC Graphinex KLC's - Stage 4	**SAMPLE ID:**	2024066_002

Particle Size Distribution



Particle Size (mm)	% Passing
0.300	100%
0.150	94%
0.075	55%
Particle Size (microns)	
49	45%
35	42%
26	36%
18	30%
13	28%
9	25%
7	22%
5	20%
1	14%

Median Particle Size (mm)*	0.058

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Analysis Notes

Samples analysed as received.

Sample Comments:

Loss on Pretreatment NA

Sample Description:

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.79

Analysed: 12-Apr-25

Limit of Reporting: 1%

Dispersion Method Shaker

NATA Accreditation: 825 Site: Brisbane
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NATA
WORLD RECOGNISED ACCREDITATION

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

Certificate of Analysis

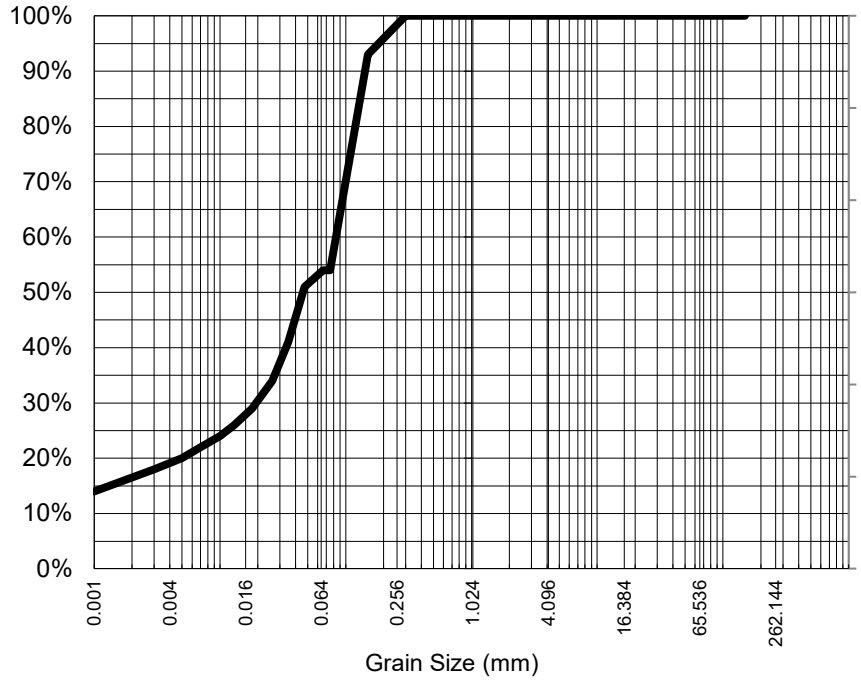
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Stafford, QLD 4053
pH 07 3243 7222
samples.brisbane@alsenviro.com

ALS Environmental

Brisbane QLD

CLIENT:	MELINDA HILTON	**DATE REPORTED:**	16-Apr-2025
COMPANY:	RGS ENVIRONMENTAL CONSULTANTS PTY LTD	**DATE RECEIVED:**	10-Apr-2025
ADDRESS:	45 Rosedale Street Coopers Plains	**REPORT NO:**	EB2512414-003 / PSD
PROJECT:	2024066 AARC Graphinex KLC's - Stage 4	**SAMPLE ID:**	2024066_003

Particle Size Distribution



Particle Size (mm)	% Passing
0.300	100%
0.150	93%
0.075	54%
Particle Size (microns)	
47	51%
35	41%
26	34%
18	29%
13	26%
10	24%
7	22%
5	20%
1	14%

Median Particle Size (mm)*	0.046

Median Particle Size is not covered under the current scope of ALS's NATA accreditation.

Analysis Notes

Samples analysed as received.

Sample Comments:

Analysed: 12-Apr-25

Loss on Pretreatment NA

Limit of Reporting: 1%

Sample Description:

Dispersion Method Shaker

Test Method: AS1289.3.6.2/AS1289.3.6.3

Soil Particle Density (<2.36mm) 2.75

NATA Accreditation: 825 Site: Brisbane
This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.

NATA
WORLD RECOGNISED ACCREDITATION

Satish Trivedi
Soil Senior Chemist
Authorised Signatory

CERTIFICATE OF ANALYSIS

Work Order	: **EB2513490**	Page	: 1 of 8
Amendment	: **2**		
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 17-Apr-2025 16:10
Order number	: ----	Date Analysis Commenced	: 22-Apr-2025
C-O-C number	: ----	Issue Date	: 07-May-2025 12:34
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Organics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager - Brisbane	Brisbane Organics, 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.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for some samples due to analytes not quantified in this report.
- Amendment (07/05/2025):This report has been amended following the correspondence with Melinda Hilton via email to update the sample IDs.
- EP005 - (Total Organic Carbon): Results for sample '2024066_KCL3' (EB2513490-003) may bias low due to large amounts of sediment. The samples was decanted before analysis.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
			Sampling date / time	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EB2513490-001	EB2513490-002	EB2513490-003	EB2513490-004	EB2513490-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**6.14**	**7.59**	**8.52**	**6.49**	**5.81**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**286**	**191**	**484**	**1030**	**974**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**26**	**25**	**101**	**30**	**5**
Total Alkalinity as CaCO3	----	1	mg/L	**26**	**25**	**101**	**30**	**5**
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	**21**	**1**	<1	**15**	**50**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**20**	**12**	**101**	**413**	**374**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**39**	**20**	**8**	**7**	**9**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**1**	<1	**2**	**106**	**81**
Magnesium	7439-95-4	1	mg/L	<1	**2**	<1	**12**	**11**
Sodium	7440-23-5	1	mg/L	**50**	**35**	**92**	**72**	**69**
Potassium	7440-09-7	1	mg/L	**2**	**2**	**4**	**5**	**6**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**1.16**	**11.4**	**0.60**	**0.22**	**1.27**
Antimony	7440-36-0	0.001	mg/L	**0.001**	<0.001	**0.047**	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	**0.002**	**0.005**	**0.012**	**0.001**	**0.001**
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	**0.002**
Barium	7440-39-3	0.001	mg/L	**0.049**	**0.032**	**0.004**	**0.056**	**0.061**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	**0.0032**	**0.0010**
Chromium	7440-47-3	0.001	mg/L	**0.002**	**0.010**	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
			Sampling date / time	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00
Compound	CAS Number	LOR	Unit	EB2513490-001	EB2513490-002	EB2513490-003	EB2513490-004	EB2513490-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued								
Cobalt	7440-48-4	0.001	mg/L	**0.007**	**0.091**	**0.005**	**1.40**	**0.365**
Copper	7440-50-8	0.001	mg/L	**0.018**	**0.040**	**0.003**	**0.004**	<0.001
Lead	7439-92-1	0.001	mg/L	**0.003**	**0.003**	**0.001**	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L	**0.118**	**0.050**	**0.004**	**3.28**	**2.56**
Molybdenum	7439-98-7	0.001	mg/L	<0.001	**0.011**	**0.081**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	**0.003**	**0.007**	**0.005**	**1.56**	**0.821**
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	7440-29-1	0.001	mg/L	<0.001	**0.001**	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L	**0.001**	<0.001	**0.001**	<0.001	**0.002**
Vanadium	7440-62-2	0.01	mg/L	<0.01	**0.06**	**0.01**	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L	**0.255**	**0.033**	<0.005	**0.536**	**0.204**
Boron	7440-42-8	0.05	mg/L	**0.06**	<0.05	**0.06**	<0.05	**0.05**
Iron	7439-89-6	0.05	mg/L	**0.85**	**6.85**	**0.15**	**0.26**	**17.4**
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.2**	**2.4**	**4.0**	**2.0**	**3.2**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**2.04**	**1.31**	**4.35**	**9.40**	**8.14**
ø Total Cations	----	0.01	meq/L	**2.28**	**1.74**	**4.20**	**9.54**	**8.10**
ø Ionic Balance	----	0.01	%	**----**	**----**	**1.67**	**0.74**	**0.24**
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	**40**	**3**	**6**	**8**	**5**
EP071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction	----	50	µg/L	**550**	**120**	**360**	**380**	**230**
C15 - C28 Fraction	----	100	µg/L	**150**	<100	<100	**170**	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
				Sampling date / time	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00	17-Apr-2025 00:00
Compound	CAS Number	LOR	Unit		EB2513490-001	EB2513490-002	EB2513490-003	EB2513490-004	EB2513490-005
					Result	Result	Result	Result	Result
EP071: Total Petroleum Hydrocarbons - Continued									
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**700**	**120**	**360**	**550**	**230**
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		**420**	**130**	**260**	**330**	**170**
>C16 - C34 Fraction	----	100	µg/L		**100**	<100	<100	**100**	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		**520**	**130**	**260**	**430**	**170**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
			Sampling date / time	17-Apr-2025 00:00	17-Apr-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2513490-006	EB2513490-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**6.28**	**7.00**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**2950**	**3240**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**13**	**68**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**13**	**68**	----	----	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	**9**	**10**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**754**	**950**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**507**	**518**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**470**	**496**	----	----	----
Magnesium	7439-95-4	1	mg/L	**67**	**72**	----	----	----
Sodium	7440-23-5	1	mg/L	**63**	**61**	----	----	----
Potassium	7440-09-7	1	mg/L	**52**	**51**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.01**	**0.01**	----	----	----
Antimony	7440-36-0	0.001	mg/L	**0.002**	**0.001**	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.002**	**0.002**	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.073**	**0.054**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0002**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
			Sampling date / time	17-Apr-2025 00:00	17-Apr-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2513490-006	EB2513490-007	--------	--------	--------
				Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Cobalt	7440-48-4	0.001	mg/L	**0.002**	**0.002**	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.003**	**0.003**	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	**1.15**	**4.21**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	**0.012**	**0.005**	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.006**	**0.008**	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Thorium	7440-29-1	0.001	mg/L	<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L	**0.005**	**0.010**	----	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.032**	**0.039**	----	----	----
Boron	7440-42-8	0.05	mg/L	**0.44**	**0.73**	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	**1.20**	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**1.8**	**1.5**	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**30.3**	**35.8**	----	----	----
ø Total Cations	----	0.01	meq/L	**33.0**	**34.6**	----	----	----
ø Ionic Balance	----	0.01	%	**4.39**	**1.58**	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	**12**	**10**	----	----	----
EP071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction	----	50	µg/L	**450**	**380**	----	----	----
C15 - C28 Fraction	----	100	µg/L	**1860**	**1580**	----	----	----
C29 - C36 Fraction	----	50	µg/L	**70**	**60**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
				Sampling date / time	17-Apr-2025 00:00	17-Apr-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2513490-006	EB2513490-007	--------	--------	--------
					Result	Result	----	----	----
EP071: Total Petroleum Hydrocarbons - Continued									
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**2380**	**2020**	**----**	**----**	**----**
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		**1270**	**1150**	**----**	**----**	**----**
>C16 - C34 Fraction	----	100	µg/L		**1050**	**830**	**----**	**----**	**----**
>C34 - C40 Fraction	----	100	µg/L		<100	<100	**----**	**----**	**----**
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		**2320**	**1980**	**----**	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **EB2516624**	Page	: 1 of 9
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 15-May-2025 16:54
Order number	: ----	Date Analysis Commenced	: 16-May-2025
C-O-C number	: ----	Issue Date	: 22-May-2025 18:23
Sampler	: PAUL HILTON		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

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- Analytical Results
- Surrogate Control Limits

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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*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, 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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP005 - (Total Organic Carbon): Results for samples '2024066_KLC1' (EB2516624-001), '2024066_KLC2' (EB2516624-002) & '2024066_KLC3' (EB2516624-003) may bias low due to large amounts of sediment. The samples were decanted before analysis.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00
Compound	CAS Number	LOR	Unit		EB2516624-001	EB2516624-002	EB2516624-003	EB2516624-004	EB2516624-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		5.99	7.25	8.29	6.59	5.59
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		155	510	379	360	470
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		8	44	107	7	1
Total Alkalinity as CaCO3	----	1	mg/L		8	44	107	7	1
ED038: Acidity									
Acidity as CaCO3	----	1	mg/L		12	1	<1	2	9
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		17	37	73	142	200
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		15	81	3	<1	3
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	<1	1	33	39
Magnesium	7439-95-4	1	mg/L		<1	<1	<1	4	6
Sodium	7440-23-5	1	mg/L		27	89	75	19	31
Potassium	7440-09-7	1	mg/L		<1	1	3	2	3
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.84	0.35	0.17	0.04	0.60
Antimony	7440-36-0	0.001	mg/L		0.005	0.003	0.149	0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		0.001	0.006	0.022	0.004	0.002
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	0.001
Barium	7440-39-3	0.001	mg/L		0.029	0.003	0.002	0.013	0.020
Cadmium	7440-43-9	0.0001	mg/L		0.0002	<0.0001	0.0002	0.0007	0.0007
Chromium	7440-47-3	0.001	mg/L		0.003	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00
					EB2516624-001	EB2516624-002	EB2516624-003	EB2516624-004	EB2516624-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Cobalt	7440-48-4	0.001	mg/L		**0.004**	**0.004**	<0.001	**0.109**	**0.092**
Copper	7440-50-8	0.001	mg/L		**0.032**	**0.004**	**0.004**	**0.008**	**0.004**
Lead	7439-92-1	0.001	mg/L		**0.002**	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.040**	**0.004**	**0.001**	**0.533**	**0.831**
Molybdenum	7439-98-7	0.001	mg/L		**0.003**	**0.104**	**0.044**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.006**	<0.001	**0.002**	**0.090**	**0.196**
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	7440-29-1	0.001	mg/L		**0.001**	<0.001	**0.001**	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		**0.001**	<0.001	**0.002**	<0.001	<0.001
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.02**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.223**	<0.005	<0.005	**0.093**	**0.095**
Boron	7440-42-8	0.05	mg/L		**0.12**	**0.07**	**0.18**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**1.08**	**0.21**	<0.05	<0.05	**1.64**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**6.4**	**3.6**	**2.0**	**2.5**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.94**	**3.93**	**3.74**	**3.10**	**4.27**
ø Total Cations	----	0.01	meq/L		**1.17**	**3.90**	**3.39**	**2.85**	**3.86**
ø Ionic Balance	----	0.01	%		**----**	**0.48**	**4.96**	**4.08**	**4.96**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**27**	**2**	**2**	**1**	<1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		**120**	**60**	**80**	**80**	**70**
C15 - C28 Fraction	----	100	µg/L		**370**	**130**	<100	<100	<100

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00	15-May-2025 00:00
					EB2516624-001	EB2516624-002	EB2516624-003	EB2516624-004	EB2516624-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		**300**	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		**790**	**190**	**80**	**80**	**70**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		**150**	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		**580**	**140**	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**730**	**140**	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		**150**	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**86.0**	**87.3**	**86.1**	**84.1**	**88.5**
Toluene-D8	2037-26-5	2	%		**104**	**104**	**104**	**104**	**105**
4-Bromofluorobenzene	460-00-4	2	%		**100**	**104**	**103**	**103**	**94.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	15-May-2025 00:00	15-May-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2516624-006	EB2516624-007	--------	--------	--------
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.45**	**7.70**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**1910**	**1740**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**12**	**87**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**12**	**87**	----	----	----
ED038: Acidity									
Acidity as CaCO3	----	1	mg/L		**4**	**5**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**940**	**816**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**16**	**46**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**330**	**254**	----	----	----
Magnesium	7439-95-4	1	mg/L		**27**	**29**	----	----	----
Sodium	7440-23-5	1	mg/L		**18**	**24**	----	----	----
Potassium	7440-09-7	1	mg/L		**22**	**28**	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.13**	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.003**	**0.002**	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L		**0.101**	**0.036**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0004**	**0.0002**	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	15-May-2025 00:00	15-May-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2516624-006	EB2516624-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Cobalt	7440-48-4	0.001	mg/L		**0.013**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.030**	**0.003**	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**2.13**	**3.14**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		**0.003**	**0.007**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.024**	**0.003**	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.002**	**0.005**	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.112**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.73**	**0.64**	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	**0.08**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**2.3**	**2.2**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**20.3**	**20.0**	----	----	----
ø Total Cations	----	0.01	meq/L		**20.0**	**16.8**	----	----	----
ø Ionic Balance	----	0.01	%		**0.56**	**8.69**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**3**	**5**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		**120**	**280**	----	----	----
C15 - C28 Fraction	----	100	µg/L		**440**	**1120**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	15-May-2025 00:00	15-May-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2516624-006	EB2516624-007	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	**50**	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**560**	**1450**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		**180**	**740**	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**370**	**670**	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**550**	**1410**	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		**180**	**740**	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**83.9**	**86.0**	----	----	----
Toluene-D8	2037-26-5	2	%		**104**	**104**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**97.9**	**99.5**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

CERTIFICATE OF ANALYSIS

Work Order	: **EB2520078**	Page	: 1 of 10
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 11-Jun-2025 16:05
Order number	: ----	Date Analysis Commenced	: 12-Jun-2025
C-O-C number	: ----	Issue Date	: 18-Jun-2025 14:39
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
- Surrogate Control Limits

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*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Organics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, 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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP005 - (Total Organic Carbon): Results for sample '2024066-KLC3' (EB2520078-003) may bias low due to large amounts of sediment. The sample was decanted before analysis.
- EP071 – TRH Semivolatile Fraction: The LOR for C10 - C14 Fraction has been raised in sample '2024066-KLC2' (EB2520078-002) due to laboratory background contamination.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066-KLC1	2024066-KLC2	2024066-KLC3	2024066-KLC4	2024066-KLC5
				Sampling date / time	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00
Compound	CAS Number	LOR	Unit		EB2520078-001	EB2520078-002	EB2520078-003	EB2520078-004	EB2520078-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.74	8.09	8.65	6.61	5.46
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		89	1080	287	257	293
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	13	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		25	119	104	6	2
Total Alkalinity as CaCO3	----	1	mg/L		25	119	116	6	2
ED038: Acidity									
Acidity as CaCO3	----	1	mg/L		16	<1	<1	3	9
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		11	123	33	105	129
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		6	210	1	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		2	<1	2	27	25
Magnesium	7439-95-4	1	mg/L		1	<1	<1	3	4
Sodium	7440-23-5	1	mg/L		22	215	56	13	19
Potassium	7440-09-7	1	mg/L		1	3	2	1	2
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		1.27	0.28	0.56	0.04	0.57
Antimony	7440-36-0	0.001	mg/L		0.001	0.008	0.102	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		0.001	0.014	0.018	0.002	<0.001
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L		0.147	0.007	0.002	0.010	0.013
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	0.0008	0.0002
Chromium	7440-47-3	0.001	mg/L		0.003	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066-KLC1	2024066-KLC2	2024066-KLC3	2024066-KLC4	2024066-KLC5
				Sampling date / time	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00
Compound	CAS Number	LOR	Unit		EB2520078-001	EB2520078-002	EB2520078-003	EB2520078-004	EB2520078-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Cobalt	7440-48-4	0.001	mg/L		**0.006**	<0.001	<0.001	**0.117**	**0.054**
Copper	7440-50-8	0.001	mg/L		**0.026**	**0.003**	**0.003**	**0.013**	**0.009**
Lead	7439-92-1	0.001	mg/L		**0.004**	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.136**	**0.002**	**0.001**	**0.564**	**0.508**
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.376**	**0.021**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.005**	<0.001	<0.001	**0.107**	**0.112**
Selenium	7782-49-2	0.01	mg/L		<0.01	**0.03**	<0.01	<0.01	<0.01
Thorium	7440-29-1	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		**0.001**	**0.004**	**0.001**	<0.001	<0.001
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.04**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.734**	<0.005	<0.005	**0.172**	**0.073**
Boron	7440-42-8	0.05	mg/L		**0.09**	**0.18**	**0.18**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**1.02**	**0.20**	**0.11**	<0.05	**1.18**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.2**	**15.5**	**1.9**	**1.4**	**1.8**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.90**	**10.9**	**3.03**	**2.31**	**2.72**
ø Total Cations	----	0.01	meq/L		**----**	**----**	**2.71**	**----**	**----**
ø Total Cations	----	0.01	meq/L		**1.16**	**9.43**	**----**	**2.18**	**2.45**
ø Ionic Balance	----	0.01	%		**----**	**----**	**5.57**	**----**	**----**
ø Ionic Balance	----	0.01	%		**----**	**7.06**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**82**	**4**	**2**	<1	<1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066-KLC1	2024066-KLC2	2024066-KLC3	2024066-KLC4	2024066-KLC5
				Sampling date / time	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00
Compound	CAS Number	LOR	Unit		EB2520078-001	EB2520078-002	EB2520078-003	EB2520078-004	EB2520078-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	µg/L		**60**	<60	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		**140**	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		**200**	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		**120**	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**120**	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		**----**	<100	**----**	**----**	**----**
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	**----**	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**109**	**111**	**109**	**112**	**115**
Toluene-D8	2037-26-5	2	%		**97.7**	**97.2**	**95.9**	**96.8**	**98.1**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066-KLC1	2024066-KLC2	2024066-KLC3	2024066-KLC4	2024066-KLC5
				Sampling date / time	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00	11-Jun-2025 00:00
Compound	CAS Number	LOR	Unit		EB2520078-001	EB2520078-002	EB2520078-003	EB2520078-004	EB2520078-005
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	2	%		**108**	**110**	**104**	**107**	**109**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066-KLC6	2024066-KLC7	----	----	----
				Sampling date / time	11-Jun-2025 00:00	11-Jun-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2520078-006	EB2520078-007	--------	--------	--------
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.29**	**7.56**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**2180**	**755**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**38**	**108**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**38**	**108**	----	----	----
ED038: Acidity									
Acidity as CaCO3	----	1	mg/L		**5**	**4**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1220**	**309**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**3**	**3**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**356**	**119**	----	----	----
Magnesium	7439-95-4	1	mg/L		**27**	**12**	----	----	----
Sodium	7440-23-5	1	mg/L		**16**	**12**	----	----	----
Potassium	7440-09-7	1	mg/L		**18**	**16**	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	**0.002**	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L		**0.090**	**0.029**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0001**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066-KLC6	2024066-KLC7	----	----	----
				Sampling date / time	11-Jun-2025 00:00	11-Jun-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2520078-006	EB2520078-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Cobalt	7440-48-4	0.001	mg/L		**0.007**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**3.96**	**1.22**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		**0.002**	**0.012**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.025**	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.001**	**0.002**	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.016**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.33**	**0.40**	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	**0.92**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**1.5**	**2.6**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**26.2**	**8.68**	----	----	----
ø Total Cations	----	0.01	meq/L		**21.4**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**7.86**	----	----	----
ø Ionic Balance	----	0.01	%		**10.1**	----	----	----	----
ø Ionic Balance	----	0.01	%		----	**4.95**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**3**	**4**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066-KLC6	2024066-KLC7	----	----	----
				Sampling date / time	11-Jun-2025 00:00	11-Jun-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2520078-006	EB2520078-007	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	µg/L		**80**	**160**	----	----	----
C15 - C28 Fraction	----	100	µg/L		**150**	**620**	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**230**	**780**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	**460**	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**130**	**320**	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**130**	**780**	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	**460**	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**107**	**112**	----	----	----
Toluene-D8	2037-26-5	2	%		**93.8**	**100.0**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**106**	**112**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

CERTIFICATE OF ANALYSIS

Work Order	: **EB2523737**	Page	: 1 of 6
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 09-Jul-2025 14:00
Order number	: ----	Date Analysis Commenced	: 10-Jul-2025
C-O-C number	: ----	Issue Date	: 15-Jul-2025 18:41
Sampler	: Koshik Gounder		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, 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.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- EP005 - (Total Organic Carbon): Results for sample '2024066_KLC1' (Free Leach (L4)) may bias low due to large amounts of sediment. The sample was decanted before analysis.
- ED045G (Chloride): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC1 Free Leach (L4)	2024066_KLC2 Free Leach (L4)	2024066_KLC3 Free Leach (L4)	2024066_KLC4 Free Leach (L4)	2024066_KLC5 Free Leach (L4)
			Sampling date / time	09-Jul-2025 00:00	09-Jul-2025 00:00	09-Jul-2025 00:00	09-Jul-2025 00:00	09-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EB2523737-001	EB2523737-002	EB2523737-003	EB2523737-004	EB2523737-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**6.67**	**7.99**	**8.37**	**6.74**	**5.48**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**101**	**766**	**315**	**248**	**245**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**14**	**95**	**110**	**9**	**2**
Total Alkalinity as CaCO3	----	1	mg/L	**14**	**95**	**110**	**9**	**2**
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	**14**	**1**	<1	**2**	**9**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**7**	**71**	**44**	**88**	**101**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<5	**128**	<1	<1	<1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**2**	<1	**2**	**26**	**23**
Magnesium	7439-95-4	1	mg/L	**2**	<1	<1	**2**	**4**
Sodium	7440-23-5	1	mg/L	**22**	**221**	**64**	**18**	**17**
Potassium	7440-09-7	1	mg/L	**1**	**3**	**3**	**1**	**2**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**2.03**	**0.29**	**0.20**	**0.02**	**0.62**
Antimony	7440-36-0	0.001	mg/L	**0.001**	**0.011**	**0.078**	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	**0.001**	**0.017**	**0.015**	**0.003**	<0.001
Beryllium	7440-41-7	0.001	mg/L	**0.001**	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L	**0.173**	**0.006**	**0.001**	**0.007**	**0.012**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	**0.0003**	**0.0002**
Chromium	7440-47-3	0.001	mg/L	**0.110**	<0.001	<0.001	<0.001	<0.001

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	2024066_KLC1 Free Leach (L4)	2024066_KLC2 Free Leach (L4)	2024066_KLC3 Free Leach (L4)	2024066_KLC4 Free Leach (L4)	2024066_KLC5 Free Leach (L4)
				Sampling date / time	09-Jul-2025 00:00	09-Jul-2025 00:00	09-Jul-2025 00:00	09-Jul-2025 00:00	09-Jul-2025 00:00
					EB2523737-001	EB2523737-002	EB2523737-003	EB2523737-004	EB2523737-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Cobalt	7440-48-4	0.001	mg/L		**0.006**	**0.001**	<0.001	**0.041**	**0.048**
Copper	7440-50-8	0.001	mg/L		**0.026**	**0.003**	**0.002**	**0.006**	**0.016**
Lead	7439-92-1	0.001	mg/L		**0.004**	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.141**	**0.002**	<0.001	**0.405**	**0.481**
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.366**	**0.028**	**0.001**	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.006**	<0.001	<0.001	**0.032**	**0.103**
Selenium	7782-49-2	0.01	mg/L		<0.01	**0.03**	<0.01	<0.01	<0.01
Thorium	7440-29-1	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		**0.001**	**0.004**	**0.001**	<0.001	<0.001
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.05**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.825**	<0.005	<0.005	**0.052**	**0.078**
Boron	7440-42-8	0.05	mg/L		**0.06**	**0.26**	**0.13**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**1.67**	**0.19**	<0.05	<0.05	**1.24**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**10.0**	**1.8**	**1.5**	**1.7**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**----**	**7.51**	**----**	**2.09**	**----**
ø Total Anions	----	0.01	meq/L		**0.42**	**----**	**3.11**	**----**	**2.14**
ø Total Cations	----	0.01	meq/L		**1.25**	**9.69**	**2.96**	**2.27**	**2.27**
ø Ionic Balance	----	0.01	%		**----**	**16.2**	**2.53**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**26**	**4**	**3**	<1	<1

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6 Free Leach (L4)	2024066_KLC7 Saturated (L4)	----	----	----
			Sampling date / time	09-Jul-2025 00:00	09-Jul-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2523737-006	EB2523737-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**6.82**	**7.56**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**1990**	**559**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**17**	**90**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**17**	**90**	----	----	----
ED038: Acidity								
Acidity as CaCO3	----	1	mg/L	**5**	**3**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**1230**	**191**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**2**	**2**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**409**	**78**	----	----	----
Magnesium	7439-95-4	1	mg/L	**32**	**8**	----	----	----
Sodium	7440-23-5	1	mg/L	**17**	**9**	----	----	----
Potassium	7440-09-7	1	mg/L	**23**	**14**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.002**	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.076**	**0.035**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0002**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach (L4)	2024066_KLC7 Saturated (L4)	----	----	----
				Sampling date / time	09-Jul-2025 00:00	09-Jul-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2523737-006	EB2523737-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Cobalt	7440-48-4	0.001	mg/L		**0.025**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**7.35**	**0.762**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.015**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.087**	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.001	**0.001**	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.022**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.22**	**0.27**	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	**0.38**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**1.5**	**3.0**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**26.0**	**5.83**	----	----	----
ø Total Cations	----	0.01	meq/L		**24.4**	**5.30**	----	----	----
ø Ionic Balance	----	0.01	%		**3.24**	**4.77**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**2**	**4**	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: **EB2527411**	Page	: 1 of 9
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 07-Aug-2025 16:50
Order number	: ----	Date Analysis Commenced	: 08-Aug-2025
C-O-C number	: ----	Issue Date	: 14-Aug-2025 22:12
Sampler	: PAUL HILTON		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
- Surrogate Control Limits

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*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Tatijana Markoska	Senior Chemist - Organics	Brisbane Organics, 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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- EP071 – TRH Semivolatile Fraction: Sample EB2527069_002 shows poor matrix spike recovery due to possible heterogeneity.
- EP005 - (Total Organic Carbon): Results for samples '2024066_KLC1' (EB2527411-001) & '2024066_KLC2' (EB2527411-002) may bias low due to large amounts of sediment. The samples were decanted before analysis.
- ED041G (Sulfate as SO4): Sample 2024066_KLC5 (EB2527411-005) was diluted due to matrix interference. LOR adjusted accordingly.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
				Sampling date / time	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00
Compound	CAS Number	LOR	Unit		EB2527411-001	EB2527411-002	EB2527411-003	EB2527411-004	EB2527411-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.58	8.43	8.49	6.94	5.22
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		50	686	255	233	208
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	7	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		14	111	98	10	2
Total Alkalinity as CaCO3	----	1	mg/L		14	111	105	10	2
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		5	46	27	93	89
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1	91	<1	<1	<5
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	<1	2	22	18
Magnesium	7439-95-4	1	mg/L		<1	<1	<1	2	4
Sodium	7440-23-5	1	mg/L		14	154	57	21	14
Potassium	7440-09-7	1	mg/L		<1	2	3	1	2
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		1.64	0.68	0.42	0.02	0.68
Antimony	7440-36-0	0.001	mg/L		0.002	0.011	0.053	0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		0.001	0.015	0.012	0.003	<0.001
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L		0.090	0.004	0.003	0.006	0.014
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	0.0003	0.0003
Chromium	7440-47-3	0.001	mg/L		0.003	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		0.003	0.002	<0.001	0.026	0.041
Copper	7440-50-8	0.001	mg/L		0.026	0.005	0.003	0.004	0.051

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
				Sampling date / time	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00
Compound	CAS Number	LOR	Unit		EB2527411-001	EB2527411-002	EB2527411-003	EB2527411-004	EB2527411-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.002**	<0.001	<0.001	<0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		**0.056**	**0.002**	**0.001**	**0.323**	**0.407**
Molybdenum	7439-98-7	0.001	mg/L		**0.001**	**0.220**	**0.030**	**0.002**	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.004**	<0.001	<0.001	**0.019**	**0.094**
Selenium	7782-49-2	0.01	mg/L		<0.01	**0.02**	<0.01	<0.01	<0.01
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L		**0.001**	**0.002**	**0.001**	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		**0.001**	**0.003**	**0.001**	<0.001	**0.001**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.06**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.386**	<0.005	<0.005	**0.033**	**0.088**
Boron	7440-42-8	0.05	mg/L		**0.06**	**0.20**	**0.15**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**1.06**	**0.39**	**0.09**	<0.05	**1.51**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**10.5**	**1.2**	**1.3**	**1.4**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.41**	**5.74**	**2.66**	**2.14**	**1.89**
ø Total Cations	----	0.01	meq/L		**0.61**	**6.75**	**2.66**	**2.20**	**1.89**
ø Ionic Balance	----	0.01	%		**----**	**8.06**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**17**	**2**	**2**	<1	<1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**----**	**----**	**----**	**----**
C10 - C14 Fraction	----	50	µg/L		**60**	**----**	**----**	**----**	**----**
C15 - C28 Fraction	----	100	µg/L		**200**	**----**	**----**	**----**	**----**
C29 - C36 Fraction	----	50	µg/L		<50	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
				Sampling date / time	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00	07-Aug-2025 00:00
Compound	CAS Number	LOR	Unit		EB2527411-001	EB2527411-002	EB2527411-003	EB2527411-004	EB2527411-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**260**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**190**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		**190**	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**9**	<1	<1	**2**	**9**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**102**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**98.0**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**104**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
			Sampling date / time	07-Aug-2025 00:00	07-Aug-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2527411-006	EB2527411-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**4.90**	**7.62**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**1900**	**488**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	**87**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	**87**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**649**	**152**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**20**	**1**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**378**	**75**	----	----	----
Magnesium	7439-95-4	1	mg/L	**44**	**7**	----	----	----
Sodium	7440-23-5	1	mg/L	**20**	**8**	----	----	----
Potassium	7440-09-7	1	mg/L	**27**	**14**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.94**	**0.01**	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.002**	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.085**	**0.035**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0013**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**0.592**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.002**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
				Sampling date / time	07-Aug-2025 00:00	07-Aug-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2527411-006	EB2527411-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**18.7**	**0.595**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		**0.005**	**0.016**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**1.36**	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L		**0.01**	<0.01	----	----	----
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	----	----	----
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.001	**0.001**	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.260**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.28**	**0.27**	----	----	----
Iron	7439-89-6	0.05	mg/L		**31.4**	**0.12**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**2.4**	**2.8**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**14.1**	**4.93**	----	----	----
ø Total Cations	----	0.01	meq/L		**24.0**	**5.02**	----	----	----
ø Ionic Balance	----	0.01	%		**26.1**	**0.94**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**1**	**3**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	**190**	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
				Sampling date / time	07-Aug-2025 00:00	07-Aug-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2527411-006	EB2527411-007	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	**190**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	**140**	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	**140**	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	<2	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**78**	**4**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**102**	**101**	----	----	----
Toluene-D8	2037-26-5	2	%		**104**	**104**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**105**	**113**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

CERTIFICATE OF ANALYSIS

Work Order	: **EB2530773**	Page	: 1 of 9
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 03-Sep-2025 17:00
Order number	: ----	Date Analysis Commenced	: 04-Sep-2025
C-O-C number	: ----	Issue Date	: 10-Sep-2025 14:51
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
- Surrogate Control Limits

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*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Tatijana Markoska	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, 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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00
Compound	CAS Number	LOR	Unit		EB2530773-001	EB2530773-002	EB2530773-003	EB2530773-004	EB2530773-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.66**	**8.49**	**8.56**	**6.73**	**4.94**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**47**	**614**	**275**	**268**	**273**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	**8**	**11**	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**14**	**111**	**94**	**7**	<1
Total Alkalinity as CaCO3	----	1	mg/L		**14**	**120**	**104**	**7**	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2**	**47**	**33**	**113**	**125**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		<1	**62**	<1	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**2**	<1	**3**	**24**	**21**
Magnesium	7439-95-4	1	mg/L		**2**	<1	<1	**3**	**5**
Sodium	7440-23-5	1	mg/L		**16**	**148**	**61**	**22**	**20**
Potassium	7440-09-7	1	mg/L		**1**	**2**	**3**	**1**	**2**
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**1.48**	**0.98**	**0.30**	**0.03**	**0.94**
Antimony	7440-36-0	0.001	mg/L		<0.001	**0.010**	**0.038**	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		**0.001**	**0.018**	**0.009**	**0.002**	<0.001
Beryllium	7440-41-7	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	**0.002**
Barium	7440-39-3	0.001	mg/L		**0.180**	**0.006**	**0.002**	**0.007**	**0.020**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	**0.0007**	**0.0005**
Chromium	7440-47-3	0.001	mg/L		**0.003**	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		**0.004**	**0.012**	<0.001	**0.062**	**0.055**
Copper	7440-50-8	0.001	mg/L		**0.019**	**0.009**	**0.003**	**0.008**	**0.100**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00
Compound	CAS Number	LOR	Unit		EB2530773-001	EB2530773-002	EB2530773-003	EB2530773-004	EB2530773-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.004**	<0.001	<0.001	<0.001	**0.004**
Manganese	7439-96-5	0.001	mg/L		**0.096**	**0.006**	<0.001	**0.511**	**0.574**
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.217**	**0.043**	<0.001	**0.003**
Nickel	7440-02-0	0.001	mg/L		**0.005**	<0.001	<0.001	**0.049**	**0.131**
Selenium	7782-49-2	0.01	mg/L		<0.01	**0.02**	<0.01	<0.01	<0.01
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		**0.001**	**0.004**	**0.001**	<0.001	**0.002**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.06**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.667**	**0.006**	<0.005	**0.130**	**0.137**
Boron	7440-42-8	0.05	mg/L		**0.06**	**0.24**	**0.15**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.92**	**0.61**	**0.05**	<0.05	**2.77**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**9.7**	**1.2**	**1.2**	**1.5**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**----**	**5.63**	**----**	**----**	**----**
ø Total Anions	----	0.01	meq/L		**0.32**	**----**	**2.76**	**2.49**	**2.60**
ø Total Cations	----	0.01	meq/L		**0.98**	**6.49**	**2.88**	**2.43**	**2.38**
ø Ionic Balance	----	0.01	%		**----**	**7.03**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**16**	**2**	**1**	<1	<1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**----**	**----**	**----**	**----**
C10 - C14 Fraction	----	50	µg/L		<50	**----**	**----**	**----**	**----**
C15 - C28 Fraction	----	100	µg/L		**170**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00	03-Sep-2025 00:00
					EB2530773-001	EB2530773-002	EB2530773-003	EB2530773-004	EB2530773-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		170	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		170	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		170	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		10	1	<1	3	14
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		89.8	----	----	----	----
Toluene-D8	2037-26-5	2	%		98.0	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		104	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	03-Sep-2025 00:00	03-Sep-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2530773-006	EB2530773-007	--------	--------	--------
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**4.65**	**7.71**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**3300**	**492**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**3**	**85**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**3**	**85**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1920**	**177**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**320**	**1**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**470**	**76**	----	----	----
Magnesium	7439-95-4	1	mg/L		**84**	**6**	----	----	----
Sodium	7440-23-5	1	mg/L		**33**	**8**	----	----	----
Potassium	7440-09-7	1	mg/L		**50**	**14**	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**5.57**	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.003**	**0.002**	----	----	----
Beryllium	7440-41-7	0.001	mg/L		**0.004**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L		**0.052**	**0.039**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0077**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L		**3.88**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.008**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	03-Sep-2025 00:00	03-Sep-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2530773-006	EB2530773-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.002**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**52.1**	**0.586**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.018**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**8.89**	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Silver	7440-22-4	0.001	mg/L		<0.001	<0.001	----	----	----
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.005**	**0.002**	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.947**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.39**	**0.25**	----	----	----
Iron	7439-89-6	0.05	mg/L		**245**	**0.24**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**3.8**	**2.9**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**49.1**	**5.41**	----	----	----
ø Total Cations	----	0.01	meq/L		**44.8**	**----**	----	----	----
ø Total Cations	----	0.01	meq/L		**----**	**4.99**	----	----	----
ø Ionic Balance	----	0.01	%		**4.72**	**----**	----	----	----
ø Ionic Balance	----	0.01	%		**----**	**4.03**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**2**	**3**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		**90**	**50**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	03-Sep-2025 00:00	03-Sep-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2530773-006	EB2530773-007	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	µg/L		<100	**230**	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**90**	**280**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	**130**	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	**140**	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	**270**	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	**130**	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**475**	**3**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**90.5**	**91.7**	----	----	----
Toluene-D8	2037-26-5	2	%		**98.6**	**97.7**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**107**	**103**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

CERTIFICATE OF ANALYSIS

Work Order	: **EB2534609**	Page	: 1 of 9
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 02-Oct-2025 16:25
Order number	: ----	Date Analysis Commenced	: 03-Oct-2025
C-O-C number	: ----	Issue Date	: 09-Oct-2025 15:16
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
- Surrogate Control Limits

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*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, 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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP005 - (Total Organic Carbon): Results for samples '2024066_KLC1' (EB2534609-001) & '2024066_KLC2' (EB2534609-002) may bias low due to large amounts of sediment. The samples were decanted before analysis.
- EP080 - Volatile TRH/BTEX: High surrogate recoveries have been deemed acceptable as all associated analyte results are less than LOR.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EB2534609-001	EB2534609-002	EB2534609-003	EB2534609-004	EB2534609-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**5.82**	**7.86**	**8.12**	**5.45**	**4.63**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**61**	**316**	**219**	**438**	**284**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**5**	**62**	**83**	**2**	**3**
Total Alkalinity as CaCO3	----	1	mg/L		**5**	**62**	**83**	**2**	**3**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**16**	**27**	**26**	**215**	**111**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1**	**36**	<1	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**1**	<1	**3**	**64**	**25**
Magnesium	7439-95-4	1	mg/L		<1	<1	<1	**5**	**5**
Sodium	7440-23-5	1	mg/L		**13**	**68**	**43**	**12**	**13**
Potassium	7440-09-7	1	mg/L		<1	**1**	**3**	**1**	**1**
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**0.45**	**0.84**	**0.41**	**1.04**	**1.31**
Antimony	7440-36-0	0.001	mg/L		**0.002**	**0.006**	**0.045**	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		<0.001	**0.010**	**0.008**	**0.001**	**0.001**
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	**0.001**	**0.002**
Barium	7440-39-3	0.001	mg/L		**0.120**	**0.012**	**0.004**	**0.023**	**0.021**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	**0.0054**	**0.0007**
Chromium	7440-47-3	0.001	mg/L		**0.001**	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		<0.001	**0.019**	**0.002**	**0.329**	**0.057**
Copper	7440-50-8	0.001	mg/L		**0.015**	**0.011**	**0.006**	**0.248**	**0.102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EB2534609-001	EB2534609-002	EB2534609-003	EB2534609-004	EB2534609-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.001**	**0.001**	**0.003**	**0.002**	**0.011**
Manganese	7439-96-5	0.001	mg/L		**0.035**	**0.019**	**0.004**	**1.97**	**0.620**
Molybdenum	7439-98-7	0.001	mg/L		**0.002**	**0.077**	**0.050**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.001**	**0.002**	**0.260**	**0.138**
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	**0.001**	<0.001	**0.001**	**0.003**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.04**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.293**	**0.018**	**0.007**	**1.07**	**0.169**
Boron	7440-42-8	0.05	mg/L		<0.05	**0.14**	**0.15**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.13**	**0.34**	**0.22**	**1.25**	**2.46**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.5**	**4.7**	**1.0**	**1.9**	**1.5**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.46**	**2.82**	**2.20**	**4.52**	**2.37**
ø Total Cations	----	0.01	meq/L		**0.62**	**2.98**	**2.10**	**4.15**	**2.25**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**4.19**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**13**	**2**	**2**	<1	<1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**----**	**----**	**----**	**----**
C10 - C14 Fraction	----	50	µg/L		<50	**----**	**----**	**----**	**----**
C15 - C28 Fraction	----	100	µg/L		**170**	**----**	**----**	**----**	**----**
C29 - C36 Fraction	----	50	µg/L		<50	**----**	**----**	**----**	**----**
^ C10 - C36 Fraction (sum)	----	50	µg/L		**170**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00	02-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EB2534609-001	EB2534609-002	EB2534609-003	EB2534609-004	EB2534609-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**170**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**170**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**14**	**1**	**1**	**15**	**18**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**95.9**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**99.5**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**122**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	02-Oct-2025 00:00	02-Oct-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2534609-006	EB2534609-007	--------	--------	--------
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**3.70**	**7.35**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**4080**	**517**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		<1	**77**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		<1	**77**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2410**	**160**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**540**	**2**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**433**	**81**	----	----	----
Magnesium	7439-95-4	1	mg/L		**104**	**5**	----	----	----
Sodium	7440-23-5	1	mg/L		**31**	**7**	----	----	----
Potassium	7440-09-7	1	mg/L		**54**	**13**	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**48.2**	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.012**	**0.002**	----	----	----
Beryllium	7440-41-7	0.001	mg/L		**0.027**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L		**0.041**	**0.040**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0303**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.002**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L		**9.78**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.035**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	02-Oct-2025 00:00	02-Oct-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2534609-006	EB2534609-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.030**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**73.3**	**0.479**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.016**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**22.6**	<0.001	----	----	----
Selenium	7782-49-2	0.01	mg/L		**0.02**	<0.01	----	----	----
Thorium	7440-29-1	0.001	mg/L		**0.002**	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.053**	**0.001**	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**3.50**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.50**	**0.22**	----	----	----
Iron	7439-89-6	0.05	mg/L		**429**	**0.07**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**3.7**	**3.0**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**65.4**	**4.93**	----	----	----
ø Total Cations	----	0.01	meq/L		**57.3**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**5.09**	----	----	----
ø Ionic Balance	----	0.01	%		**6.60**	----	----	----	----
ø Ionic Balance	----	0.01	%		----	**1.64**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**5**	**2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		**60**	**60**	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	**210**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	02-Oct-2025 00:00	02-Oct-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2534609-006	EB2534609-007	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**60**	**270**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	**120**	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	**140**	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	**260**	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	**120**	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**1400**	**9**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**97.9**	**97.6**	----	----	----
Toluene-D8	2037-26-5	2	%		**96.6**	**98.6**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**118**	**120**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

CERTIFICATE OF ANALYSIS

Work Order	: **EB2545238**	Page	: 1 of 8
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 17-Dec-2025 17:15
Order number	: ----	Date Analysis Commenced	: 19-Dec-2025
C-O-C number	: ----	Issue Date	: 29-Dec-2025 13:29
Sampler	: PAUL HILTON		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, 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.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00
					EB2545238-001	EB2545238-002	EB2545238-003	EB2545238-004	EB2545238-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.54	8.32	7.88	3.84	3.77
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		59	257	243	549	826
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		17	60	70	<1	<1
Total Alkalinity as CaCO3	----	1	mg/L		17	60	70	<1	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		44	30	45	241	430
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		5	21	<1	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		1	1	5	77	83
Magnesium	7439-95-4	1	mg/L		<1	1	1	6	11
Sodium	7440-23-5	1	mg/L		17	55	45	5	8
Potassium	7440-09-7	1	mg/L		<1	2	4	2	3
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		1.33	2.07	0.37	2.69	10.0
Antimony	7440-36-0	0.001	mg/L		0.002	0.011	0.056	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		0.001	0.018	0.007	0.003	0.010
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	0.003	0.012
Barium	7440-39-3	0.001	mg/L		0.125	0.034	0.003	0.036	0.057
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	0.0093	0.0043
Chromium	7440-47-3	0.001	mg/L		0.004	0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		0.003	0.090	0.004	0.476	0.562
Copper	7440-50-8	0.001	mg/L		0.020	0.048	0.004	0.608	0.200

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00
Compound	CAS Number	LOR	Unit		EB2545238-001	EB2545238-002	EB2545238-003	EB2545238-004	EB2545238-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.002**	**0.001**	**0.001**	**0.019**	**0.025**
Manganese	7439-96-5	0.001	mg/L		**0.041**	**0.028**	**0.005**	**2.69**	**3.11**
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.035**	**0.055**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.004**	**0.003**	**0.004**	**0.479**	**1.37**
Selenium	7782-49-2	0.004	mg/L		<0.004	**0.009**	<0.004	**0.004**	**0.007**
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	<0.001	**0.004**	**0.025**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.09**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.442**	**0.028**	**0.013**	**1.72**	**0.957**
Boron	7440-42-8	0.05	mg/L		**0.09**	**0.34**	**0.40**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.82**	**0.77**	**0.12**	**5.59**	**73.5**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.5**	**3.8**	**0.8**	**3.2**	**6.0**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**1.40**	**2.42**	**2.34**	**5.02**	**8.95**
ø Total Cations	----	0.01	meq/L		**1.01**	**----**	**----**	**----**	**9.41**
ø Total Cations	----	0.01	meq/L		**----**	**2.58**	**2.39**	**4.60**	**----**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**----**	**2.49**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**4.29**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**23**	**2**	**3**	**1**	**1**
EP071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		**210**	**----**	**----**	**----**	**----**
C15 - C28 Fraction	----	100	µg/L		**680**	**----**	**----**	**----**	**----**
C29 - C36 Fraction	----	50	µg/L		<50	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00	17-Dec-2025 00:00
Compound	CAS Number	LOR	Unit		EB2545238-001	EB2545238-002	EB2545238-003	EB2545238-004	EB2545238-005
					Result	Result	Result	Result	Result
EP071: Total Petroleum Hydrocarbons - Continued									
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		**890**	**----**	**----**	**----**	**----**
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		**320**	**----**	**----**	**----**	**----**
>C16 - C34 Fraction	----	100	µg/L		**570**	**----**	**----**	**----**	**----**
>C34 - C40 Fraction	----	100	µg/L		<100	**----**	**----**	**----**	**----**
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		**890**	**----**	**----**	**----**	**----**
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**11**	<1	**3**	**42**	**195**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	17-Dec-2025 00:00	17-Dec-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2545238-006	EB2545238-007	--------	--------	--------
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**3.33**	**7.71**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**5320**	**571**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		<1	**78**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		<1	**78**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**3710**	**186**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**38**	**2**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**378**	**94**	----	----	----
Magnesium	7439-95-4	1	mg/L		**126**	**5**	----	----	----
Sodium	7440-23-5	1	mg/L		**22**	**7**	----	----	----
Potassium	7440-09-7	1	mg/L		**49**	**14**	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**192**	**0.04**	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L		**0.039**	**0.002**	----	----	----
Beryllium	7440-41-7	0.001	mg/L		**0.096**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L		**0.027**	**0.057**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.102**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.013**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L		**14.2**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.873**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	17-Dec-2025 00:00	17-Dec-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2545238-006	EB2545238-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.096**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**83.4**	**0.523**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.012**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**34.3**	<0.001	----	----	----
Selenium	7782-49-2	0.004	mg/L		**0.044**	<0.004	----	----	----
Thorium	7440-29-1	0.001	mg/L		**0.010**	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.447**	**0.002**	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**18.0**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.45**	**0.27**	----	----	----
Iron	7439-89-6	0.05	mg/L		**188**	**0.30**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**4.4**	**8.4**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**78.3**	**5.49**	----	----	----
ø Total Cations	----	0.01	meq/L		**64.4**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**5.76**	----	----	----
ø Ionic Balance	----	0.01	%		**9.72**	----	----	----	----
ø Ionic Balance	----	0.01	%		----	**2.46**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**9**	**4**	----	----	----
EP071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		**390**	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		**220**	**130**	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	17-Dec-2025 00:00	17-Dec-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2545238-006	EB2545238-007	--------	--------	--------
					Result	Result	----	----	----
EP071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	µg/L		**610**	**130**	**----**	**----**	**----**
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		**410**	**100**	**----**	**----**	**----**
>C16 - C34 Fraction	----	100	µg/L		<100	<100	**----**	**----**	**----**
>C34 - C40 Fraction	----	100	µg/L		<100	<100	**----**	**----**	**----**
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**410**	**100**	**----**	**----**	**----**
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**2600**	**7**	**----**	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **EB2602305**	Page	: 1 of 9
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 21-Jan-2026 16:25
Order number	: ----	Date Analysis Commenced	: 22-Jan-2026
C-O-C number	: ----	Issue Date	: 29-Jan-2026 18:48
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
- Surrogate Control Limits

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 Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, 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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP005 - (Total Organic Carbon): Results for samples '2024066_KLC1' (EB2602305-001) & '2024066_KLC2' (EB2602305-002) may bias low due to large amounts of sediment. The samples were decanted before analysis.
- ED045G (Chloride): Sample 2024066_KLC1 (EB2602305-001) was diluted due to matrix interference. LOR adjusted accordingly.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00
Compound	CAS Number	LOR	Unit		EB2602305-001	EB2602305-002	EB2602305-003	EB2602305-004	EB2602305-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.73	8.41	7.76	5.21	3.81
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		45	226	219	314	499
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		13	59	78	<1	<1
Total Alkalinity as CaCO3	----	1	mg/L		13	59	78	<1	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		26	24	30	147	224
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		<5	16	<1	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		2	2	5	48	53
Magnesium	7439-95-4	1	mg/L		2	2	1	4	8
Sodium	7440-23-5	1	mg/L		15	53	41	6	9
Potassium	7440-09-7	1	mg/L		1	2	4	1	2
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		1.53	2.53	0.14	0.88	2.95
Antimony	7440-36-0	0.001	mg/L		<0.001	0.008	0.049	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		<0.001	0.009	0.005	0.002	0.003
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	0.001	0.004
Barium	7440-39-3	0.001	mg/L		0.257	0.053	0.003	0.015	0.022
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	0.0034	0.0015
Chromium	7440-47-3	0.001	mg/L		0.002	0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		0.004	0.092	<0.001	0.175	0.220
Copper	7440-50-8	0.001	mg/L		0.015	0.046	0.003	0.175	0.055

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00
Compound	CAS Number	LOR	Unit		EB2602305-001	EB2602305-002	EB2602305-003	EB2602305-004	EB2602305-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.004**	**0.003**	<0.001	**0.005**	**0.011**
Manganese	7439-96-5	0.001	mg/L		**0.072**	**0.060**	**0.004**	**1.58**	**2.50**
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.008**	**0.030**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.008**	**0.005**	<0.001	**0.164**	**0.561**
Selenium	7782-49-2	0.004	mg/L		<0.004	**0.007**	<0.004	<0.004	<0.004
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	**0.001**	<0.001	**0.001**	**0.004**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.08**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.777**	**0.051**	<0.005	**0.522**	**0.330**
Boron	7440-42-8	0.05	mg/L		**0.06**	**0.27**	**0.33**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.80**	**1.11**	<0.05	**0.52**	**9.79**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**3.6**	**0.8**	**1.8**	**2.5**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**----**	**2.32**	**----**	**----**	**----**
ø Total Anions	----	0.01	meq/L		**0.80**	**----**	**2.18**	**3.06**	**4.66**
ø Total Cations	----	0.01	meq/L		**----**	**----**	**----**	**----**	**4.79**
ø Total Cations	----	0.01	meq/L		**0.94**	**2.62**	**2.22**	**3.01**	**----**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**----**	**1.38**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**0.82**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**17**	**2**	**3**	<1	<1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**----**	**----**	**----**	**----**
C10 - C14 Fraction	----	50	µg/L		<50	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00	21-Jan-2026 00:00
					EB2602305-001	EB2602305-002	EB2602305-003	EB2602305-004	EB2602305-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	µg/L		**160**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**160**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**160**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**160**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**17**	<1	**2**	**11**	**51**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**85.1**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**99.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**101**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
			Sampling date / time	21-Jan-2026 00:00	21-Jan-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2602305-006	EB2602305-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**3.02**	**7.40**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**4360**	**534**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	**76**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	**76**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**3050**	**193**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**329**	**1**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**529**	**95**	----	----	----
Magnesium	7439-95-4	1	mg/L	**111**	**5**	----	----	----
Sodium	7440-23-5	1	mg/L	**18**	**7**	----	----	----
Potassium	7440-09-7	1	mg/L	**41**	**13**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**312**	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.055**	**0.001**	----	----	----
Beryllium	7440-41-7	0.001	mg/L	**0.159**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.021**	**0.046**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.192**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.018**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**11.3**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	**3.10**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	21-Jan-2026 00:00	21-Jan-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2602305-006	EB2602305-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.163**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**61.7**	**0.479**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.009**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**27.8**	<0.001	----	----	----
Selenium	7782-49-2	0.004	mg/L		**0.068**	<0.004	----	----	----
Thorium	7440-29-1	0.001	mg/L		**0.021**	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.808**	<0.001	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**51.1**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.74**	**0.21**	----	----	----
Iron	7439-89-6	0.05	mg/L		**54.3**	**0.35**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**3.8**	**3.1**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**72.8**	**5.57**	----	----	----
ø Total Cations	----	0.01	meq/L		**78.8**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**5.79**	----	----	----
ø Ionic Balance	----	0.01	%		**3.96**	----	----	----	----
ø Ionic Balance	----	0.01	%		----	**1.97**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**6**	**2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		**60**	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	**100**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	21-Jan-2026 00:00	21-Jan-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2602305-006	EB2602305-007	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**60**	**100**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**1980**	**8**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**83.9**	**82.2**	----	----	----
Toluene-D8	2037-26-5	2	%		**99.4**	**96.9**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**96.6**	**99.7**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

CERTIFICATE OF ANALYSIS

Work Order	: **EB2606057**	Page	: 1 of 9
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 18-Feb-2026 17:20
Order number	: ----	Date Analysis Commenced	: 20-Feb-2026
C-O-C number	: ----	Issue Date	: 25-Feb-2026 18:26
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
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ISO/IEC 17025 - Testing

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Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Tatijana Markoska	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

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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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP005 - (Total Organic Carbon): Results for samples '2024066_KLC1 (EB2606057-001)' & '2024066_KLC2 (EB2606057-002)' may bias low due to large amounts of sediment. The samples were decanted before analysis.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00
Compound	CAS Number	LOR	Unit		EB2606057-001	EB2606057-002	EB2606057-003	EB2606057-004	EB2606057-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.55**	**8.47**	**8.04**	**5.89**	**3.89**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**41**	**609**	**224**	**205**	**372**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	**7**	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**10**	**117**	**79**	**2**	<1
Total Alkalinity as CaCO3	----	1	mg/L		**10**	**124**	**79**	**2**	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**4**	**88**	**35**	**89**	**158**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		<1	**47**	<1	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	<1	**5**	**26**	**33**
Magnesium	7439-95-4	1	mg/L		<1	<1	**1**	**2**	**7**
Sodium	7440-23-5	1	mg/L		**10**	**130**	**39**	**4**	**6**
Potassium	7440-09-7	1	mg/L		<1	**2**	**3**	<1	**1**
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**1.30**	**0.31**	**0.07**	**0.40**	**2.42**
Antimony	7440-36-0	0.001	mg/L		**0.001**	**0.023**	**0.038**	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		<0.001	**0.027**	**0.004**	**0.001**	**0.002**
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	**0.003**
Barium	7440-39-3	0.001	mg/L		**0.059**	**0.005**	**0.003**	**0.008**	**0.016**
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	**0.0017**	**0.0011**
Chromium	7440-47-3	0.001	mg/L		**0.002**	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		**0.001**	**0.003**	<0.001	**0.078**	**0.156**
Copper	7440-50-8	0.001	mg/L		**0.012**	**0.005**	<0.001	**0.052**	**0.093**

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00
					EB2606057-001	EB2606057-002	EB2606057-003	EB2606057-004	EB2606057-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.002**	<0.001	<0.001	<0.001	**0.010**
Manganese	7439-96-5	0.001	mg/L		**0.020**	**0.003**	**0.003**	**0.921**	**2.10**
Molybdenum	7439-98-7	0.001	mg/L		**0.001**	**0.179**	**0.029**	**0.001**	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.002**	<0.001	<0.001	**0.075**	**0.424**
Selenium	7782-49-2	0.004	mg/L		<0.004	**0.031**	<0.004	<0.004	<0.004
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	**0.003**	<0.001	<0.001	**0.003**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.10**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.199**	<0.005	<0.005	**0.235**	**0.240**
Boron	7440-42-8	0.05	mg/L		<0.05	**0.43**	**0.24**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.85**	**0.24**	<0.05	**0.07**	**3.32**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**9.1**	**0.7**	**1.2**	**1.8**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.28**	**5.64**	**2.31**	**1.89**	**3.29**
ø Total Cations	----	0.01	meq/L		**----**	**----**	**----**	**1.75**	**3.11**
ø Total Cations	----	0.01	meq/L		**0.43**	**5.71**	**2.10**	**----**	**----**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**----**	**2.81**
ø Ionic Balance	----	0.01	%		**----**	**0.62**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**13**	**2**	**2**	<1	<1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**----**	**----**	**----**	**----**
C10 - C14 Fraction	----	50	µg/L		<50	**----**	**----**	**----**	**----**
C15 - C28 Fraction	----	100	µg/L		**100**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach	2024066_KLC2 Free Leach	2024066_KLC3 Free Leach	2024066_KLC4 Free Leach	2024066_KLC5 Free Leach
				Sampling date / time	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00	18-Feb-2026 00:00
Compound	CAS Number	LOR	Unit		EB2606057-001	EB2606057-002	EB2606057-003	EB2606057-004	EB2606057-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**100**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**110**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**110**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**5**	<1	<1	**5**	**38**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**91.5**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**104**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**104**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
			Sampling date / time	18-Feb-2026 00:00	18-Feb-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2606057-006	EB2606057-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**3.07**	**7.55**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**3750**	**502**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	**76**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	**76**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2470**	**177**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**115**	**2**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**419**	**79**	----	----	----
Magnesium	7439-95-4	1	mg/L	**61**	**4**	----	----	----
Sodium	7440-23-5	1	mg/L	**9**	**5**	----	----	----
Potassium	7440-09-7	1	mg/L	**24**	**11**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**195**	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.050**	**0.001**	----	----	----
Beryllium	7440-41-7	0.001	mg/L	**0.133**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.020**	**0.044**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.160**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.014**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**6.35**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	**3.84**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	18-Feb-2026 00:00	18-Feb-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2606057-006	EB2606057-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.152**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**30.3**	**0.431**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.007**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**15.6**	<0.001	----	----	----
Selenium	7782-49-2	0.004	mg/L		**0.063**	<0.004	----	----	----
Thorium	7440-29-1	0.001	mg/L		**0.014**	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.697**	<0.001	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**42.4**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.48**	**0.17**	----	----	----
Iron	7439-89-6	0.05	mg/L		**54.1**	**0.31**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**2.7**	**3.0**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**54.7**	**5.26**	----	----	----
ø Total Cations	----	0.01	meq/L		**53.9**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**4.77**	----	----	----
ø Ionic Balance	----	0.01	%		**0.74**	----	----	----	----
ø Ionic Balance	----	0.01	%		----	**4.88**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**3**	**2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	18-Feb-2026 00:00	18-Feb-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2606057-006	EB2606057-007	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**1520**	**2**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**95.6**	**92.0**	----	----	----
Toluene-D8	2037-26-5	2	%		**105**	**105**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**110**	**105**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

CERTIFICATE OF ANALYSIS

Work Order	: **EB2609975**	Page	: 1 of 9
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 18-Mar-2026 17:45
Order number	: ----	Date Analysis Commenced	: 19-Mar-2026
C-O-C number	: ----	Issue Date	: 24-Mar-2026 21:53
Sampler	: ANNA FOURIE, KOSHIK GOUNDER		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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
- Surrogate Control Limits

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*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, 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.

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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.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for some samples due to analytes not quantified in this report.
- EP005 - (Total Organic Carbon): Results for samples '2024066_KLC1 (EB2609975-001)' & '2024066_KLC2 (EB2609975-002)' may bias low due to large amounts of sediment. The samples were decanted before analysis.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER
(Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	2024066_KLC1 Free Leach L11	2024066_KLC2 Free Leach L11	2024066_KLC3 Free Leach L11	2024066_KLC4 Free Leach L11	2024066_KLC5 Free Leach L11
				Sampling date / time	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00
					EB2609975-001	EB2609975-002	EB2609975-003	EB2609975-004	EB2609975-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.93	8.72	7.93	4.62	3.57
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		29	429	174	373	630
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	11	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		11	80	59	2	<1
Total Alkalinity as CaCO3	----	1	mg/L		11	92	59	2	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		4	66	28	177	291
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		<1	32	<1	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	<1	5	50	55
Magnesium	7439-95-4	1	mg/L		<1	<1	1	4	9
Sodium	7440-23-5	1	mg/L		7	91	31	5	5
Potassium	7440-09-7	1	mg/L		<1	1	3	1	1
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.92	0.53	0.12	2.07	6.04
Antimony	7440-36-0	0.001	mg/L		0.001	0.016	0.035	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		<0.001	0.016	0.003	0.003	0.006
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	0.002	0.007
Barium	7440-39-3	0.001	mg/L		0.040	0.006	0.003	0.020	0.025
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	0.0068	0.0023
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		0.001	0.009	<0.001	0.207	0.279
Copper	7440-50-8	0.001	mg/L		0.011	0.007	0.002	0.481	0.370

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach L11	2024066_KLC2 Free Leach L11	2024066_KLC3 Free Leach L11	2024066_KLC4 Free Leach L11	2024066_KLC5 Free Leach L11
				Sampling date / time	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00
Compound	CAS Number	LOR	Unit		EB2609975-001	EB2609975-002	EB2609975-003	EB2609975-004	EB2609975-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.002**	<0.001	<0.001	**0.017**	**0.017**
Manganese	7439-96-5	0.001	mg/L		**0.014**	**0.007**	**0.002**	**1.87**	**2.37**
Molybdenum	7439-98-7	0.001	mg/L		**0.001**	**0.100**	**0.035**	**0.001**	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.003**	<0.001	<0.001	**0.221**	**0.714**
Selenium	7782-49-2	0.004	mg/L		<0.004	**0.020**	<0.004	<0.004	**0.005**
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		**0.001**	**0.002**	<0.001	**0.003**	**0.013**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.07**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.136**	**0.005**	<0.005	**1.01**	**0.515**
Boron	7440-42-8	0.05	mg/L		<0.05	**0.37**	**0.22**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.48**	**0.34**	<0.05	**2.60**	**24.8**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**6.0**	**0.6**	**2.3**	**3.7**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.30**	**4.11**	**1.76**	**3.73**	**6.06**
ø Total Cations	----	0.01	meq/L		**----**	**----**	**----**	**3.53**	**5.46**
ø Total Cations	----	0.01	meq/L		**0.30**	**3.98**	**1.76**	**----**	**----**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**2.75**	**5.20**
ø Ionic Balance	----	0.01	%		**----**	**1.62**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**10**	**3**	**2**	<1	<1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	**----**	**----**	**----**	**----**
C10 - C14 Fraction	----	50	µg/L		<50	**----**	**----**	**----**	**----**
C15 - C28 Fraction	----	100	µg/L		<100	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach L11	2024066_KLC2 Free Leach L11	2024066_KLC3 Free Leach L11	2024066_KLC4 Free Leach L11	2024066_KLC5 Free Leach L11
				Sampling date / time	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00	18-Mar-2026 00:00
Compound	CAS Number	LOR	Unit		EB2609975-001	EB2609975-002	EB2609975-003	EB2609975-004	EB2609975-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**6**	<1	<1	**22**	**108**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**106**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**93.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**103**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6 Free Leach L11	2024066_KLC7 Saturated L11	----	----	----
			Sampling date / time	18-Mar-2026 00:00	18-Mar-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2609975-006	EB2609975-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**2.95**	**7.70**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**3910**	**491**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	**101**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	**101**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2540**	**176**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**65**	**2**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**425**	**80**	----	----	----
Magnesium	7439-95-4	1	mg/L	**44**	**4**	----	----	----
Sodium	7440-23-5	1	mg/L	**6**	**5**	----	----	----
Potassium	7440-09-7	1	mg/L	**17**	**10**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**170**	**0.02**	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.058**	**0.001**	----	----	----
Beryllium	7440-41-7	0.001	mg/L	**0.131**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.018**	**0.043**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.150**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.019**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**4.56**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	**4.98**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach L11	2024066_KLC7 Saturated L11	----	----	----
				Sampling date / time	18-Mar-2026 00:00	18-Mar-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2609975-006	EB2609975-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.186**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**16.1**	**0.408**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.006**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**10.4**	<0.001	----	----	----
Selenium	7782-49-2	0.004	mg/L		**0.068**	<0.004	----	----	----
Thorium	7440-29-1	0.001	mg/L		**0.017**	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.617**	<0.001	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**36.3**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.37**	**0.17**	----	----	----
Iron	7439-89-6	0.05	mg/L		**65.1**	**0.24**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**2.2**	**3.0**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**54.7**	**5.74**	----	----	----
ø Total Cations	----	0.01	meq/L		**58.9**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**4.79**	----	----	----
ø Ionic Balance	----	0.01	%		**3.70**	----	----	----	----
ø Ionic Balance	----	0.01	%		----	**8.96**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**3**	**2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	**120**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach L11	2024066_KLC7 Saturated L11	----	----	----
				Sampling date / time	18-Mar-2026 00:00	18-Mar-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2609975-006	EB2609975-007	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	**120**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	**120**	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	**120**	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**1480**	**8**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**103**	**102**	----	----	----
Toluene-D8	2037-26-5	2	%		**95.8**	**94.6**	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**104**	**103**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

CERTIFICATE OF ANALYSIS

Work Order	: **EB2613493**	Page	: 1 of 6
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 16-Apr-2026 16:00
Order number	: ----	Date Analysis Commenced	: 18-Apr-2026
C-O-C number	: ----	Issue Date	: 23-Apr-2026 19:47
Sampler	: ANNA FOURIE		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Liam Cooley	Chemist	Brisbane Organics, 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.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP005 - (Total Organic Carbon): Results for samples '2024066_KLC1' (EB2613493-001) & '2024066_KLC2' (EB2613493-002) may bias low due to large amounts of sediment. The samples were decanted before analysis.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC1 Free Leach L12	2024066_KLC2 Free Leach L12	2024066_KLC3 Free Leach L12	2024066_KLC4 Free Leach L12	2024066_KLC5 Free Leach L12
			Sampling date / time	16-Apr-2026 00:00	16-Apr-2026 00:00	16-Apr-2026 00:00	16-Apr-2026 00:00	16-Apr-2026 00:00
Compound	CAS Number	LOR	Unit	EB2613493-001	EB2613493-002	EB2613493-003	EB2613493-004	EB2613493-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.02**	**8.45**	**7.88**	**4.51**	**3.57**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**32**	**566**	**174**	**389**	**772**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	**10**	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**15**	**122**	**56**	<1	<1
Total Alkalinity as CaCO3	----	1	mg/L	**15**	**131**	**56**	<1	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	**72**	**25**	**174**	**327**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**2**	**39**	**1**	**1**	**1**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	**5**	**52**	**57**
Magnesium	7439-95-4	1	mg/L	<1	<1	**1**	**5**	**10**
Sodium	7440-23-5	1	mg/L	**6**	**122**	**26**	**4**	**4**
Potassium	7440-09-7	1	mg/L	<1	**2**	**3**	**1**	**1**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.90**	**0.66**	**0.06**	**2.02**	**8.13**
Antimony	7440-36-0	0.001	mg/L	**0.002**	**0.041**	**0.039**	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.028**	**0.003**	**0.002**	**0.008**
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	**0.002**	**0.009**
Barium	7440-39-3	0.001	mg/L	**0.026**	**0.007**	**0.002**	**0.020**	**0.025**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	**0.0066**	**0.0028**
Chromium	7440-47-3	0.001	mg/L	**0.001**	**0.001**	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.012**	<0.001	**0.221**	**0.407**
Copper	7440-50-8	0.001	mg/L	**0.016**	**0.010**	<0.001	**0.444**	**0.340**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1 Free Leach L12	2024066_KLC2 Free Leach L12	2024066_KLC3 Free Leach L12	2024066_KLC4 Free Leach L12	2024066_KLC5 Free Leach L12
				Sampling date / time	16-Apr-2026 00:00	16-Apr-2026 00:00	16-Apr-2026 00:00	16-Apr-2026 00:00	16-Apr-2026 00:00
Compound	CAS Number	LOR	Unit		EB2613493-001	EB2613493-002	EB2613493-003	EB2613493-004	EB2613493-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.001**	**0.001**	<0.001	**0.017**	**0.019**
Manganese	7439-96-5	0.001	mg/L		**0.009**	**0.008**	**0.002**	**1.90**	**2.74**
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.113**	**0.039**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		**0.001**	<0.001	<0.001	**0.238**	**1.12**
Selenium	7782-49-2	0.004	mg/L		<0.004	**0.026**	<0.004	**0.004**	**0.008**
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	**0.002**	<0.001	**0.003**	**0.018**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.10**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.094**	**0.010**	<0.005	**0.928**	**0.636**
Boron	7440-42-8	0.05	mg/L		<0.05	**0.68**	**0.20**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.44**	**0.44**	<0.05	**2.22**	**41.8**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**7.2**	**0.6**	**2.1**	**3.9**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.36**	**5.22**	**1.67**	**3.65**	**6.84**
ø Total Cations	----	0.01	meq/L		**----**	**----**	**----**	**3.63**	**6.44**
ø Total Cations	----	0.01	meq/L		**0.26**	**5.36**	**1.54**	**----**	**----**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**0.29**	**3.01**
ø Ionic Balance	----	0.01	%		**----**	**1.34**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**10**	**3**	**1**	<1	<1
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**9**	<1	**1**	**20**	**148**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6 Free Leach L12	2024066_KLC7 Saturated	----	----	----
			Sampling date / time	16-Apr-2026 00:00	16-Apr-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2613493-006	EB2613493-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**2.79**	**7.53**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**4400**	**547**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	**77**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	**77**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2700**	**170**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**54**	**3**	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**458**	**91**	----	----	----
Magnesium	7439-95-4	1	mg/L	**48**	**4**	----	----	----
Sodium	7440-23-5	1	mg/L	**6**	**5**	----	----	----
Potassium	7440-09-7	1	mg/L	**14**	**11**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**226**	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.100**	<0.001	----	----	----
Beryllium	7440-41-7	0.001	mg/L	**0.146**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.017**	**0.046**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.152**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.045**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**4.88**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	**7.09**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6 Free Leach L12	2024066_KLC7 Saturated	----	----	----
				Sampling date / time	16-Apr-2026 00:00	16-Apr-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2613493-006	EB2613493-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.237**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**12.6**	**0.448**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.004**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**10.5**	<0.001	----	----	----
Selenium	7782-49-2	0.004	mg/L		**0.109**	<0.004	----	----	----
Thorium	7440-29-1	0.001	mg/L		**0.034**	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.516**	<0.001	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**37.4**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.42**	**0.14**	----	----	----
Iron	7439-89-6	0.05	mg/L		**49.0**	**0.11**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.9**	**2.9**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**57.7**	**5.16**	----	----	----
ø Total Cations	----	0.01	meq/L		**56.6**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**5.37**	----	----	----
ø Ionic Balance	----	0.01	%		**0.98**	----	----	----	----
ø Ionic Balance	----	0.01	%		----	**1.96**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**3**	**2**	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**1950**	**8**	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: **EB2617014**	Page	: 1 of 7
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 13-May-2026 15:25
Order number	: ----	Date Analysis Commenced	: 14-May-2026
C-O-C number	: ----	Issue Date	: 20-May-2026 16:50
Sampler	: ANNA FOURIE		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Liam Cooley	Chemist	Brisbane Organics, 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.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP005 - (Total Organic Carbon): Results for samples '2024066_KLC1' (EB2617014-001) & '2024066_KLC2' (EB2617014-002) may bias low due to large amounts of sediment. The samples were decanted before analysis.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
				Sampling date / time	13-May-2026 00:00	13-May-2026 00:00	13-May-2026 00:00	13-May-2026 00:00	13-May-2026 00:00
Compound	CAS Number	LOR	Unit		EB2617014-001	EB2617014-002	EB2617014-003	EB2617014-004	EB2617014-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.86	8.60	7.85	4.55	3.51
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		23	366	157	358	705
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	----	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	15	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		12	93	59	3	<1
Total Alkalinity as CaCO3	----	1	mg/L		12	109	59	3	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2	38	23	176	323
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		<1	21	<1	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	<1	7	50	57
Magnesium	7439-95-4	1	mg/L		<1	<1	1	5	12
Sodium	7440-23-5	1	mg/L		6	83	24	6	5
Potassium	7440-09-7	1	mg/L		<1	2	3	<1	1
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		0.77	1.34	0.06	2.27	7.96
Antimony	7440-36-0	0.001	mg/L		0.001	0.031	0.035	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L		<0.001	0.021	0.003	0.002	0.007
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	0.002	0.010
Barium	7440-39-3	0.001	mg/L		0.026	0.014	0.002	0.019	0.023
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	0.0069	0.0027
Chromium	7440-47-3	0.001	mg/L		0.001	0.002	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L		<0.001	0.026	<0.001	0.224	0.410
Copper	7440-50-8	0.001	mg/L		0.008	0.016	<0.001	0.428	0.372

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
				Sampling date / time	13-May-2026 00:00	13-May-2026 00:00	13-May-2026 00:00	13-May-2026 00:00	13-May-2026 00:00
Compound	CAS Number	LOR	Unit		EB2617014-001	EB2617014-002	EB2617014-003	EB2617014-004	EB2617014-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.001**	**0.002**	<0.001	**0.018**	**0.020**
Manganese	7439-96-5	0.001	mg/L		**0.008**	**0.017**	**0.002**	**2.04**	**3.28**
Molybdenum	7439-98-7	0.001	mg/L		**0.002**	**0.051**	**0.032**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	**0.002**	<0.001	**0.255**	**1.11**
Selenium	7782-49-2	0.004	mg/L		<0.004	**0.016**	<0.004	<0.004	**0.006**
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	**0.001**
Uranium	7440-61-1	0.001	mg/L		<0.001	**0.002**	<0.001	**0.003**	**0.019**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.09**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.093**	**0.017**	<0.005	**0.966**	**0.674**
Boron	7440-42-8	0.05	mg/L		<0.05	**0.46**	**0.17**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.44**	**1.00**	<0.05	**1.90**	**31.6**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**5.3**	**0.5**	**2.4**	**4.0**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**----**	**----**	**----**	**3.85**	**6.94**
ø Total Anions	----	0.01	meq/L		**0.28**	**3.56**	**1.66**	**----**	**----**
ø Total Cations	----	0.01	meq/L		**----**	**----**	**----**	**3.61**	**6.29**
ø Total Cations	----	0.01	meq/L		**0.26**	**3.66**	**1.55**	**----**	**----**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**3.17**	**4.92**
ø Ionic Balance	----	0.01	%		**----**	**1.39**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**8**	<1	<1	<1	<1
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**6**	<1	**1**	**20**	**120**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
			Sampling date / time	13-May-2026 00:00	13-May-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2617014-006	EB2617014-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**2.78**	**7.73**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**4080**	**537**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	**82**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	**82**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**3210**	**188**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**49**	<1	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**423**	**99**	----	----	----
Magnesium	7439-95-4	1	mg/L	**41**	**4**	----	----	----
Sodium	7440-23-5	1	mg/L	**5**	**5**	----	----	----
Potassium	7440-09-7	1	mg/L	**12**	**11**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**242**	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.079**	<0.001	----	----	----
Beryllium	7440-41-7	0.001	mg/L	**0.120**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.014**	**0.046**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.118**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.047**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**4.25**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	**6.54**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
				Sampling date / time	13-May-2026 00:00	13-May-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2617014-006	EB2617014-007	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		**0.248**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L		**9.33**	**0.494**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.004**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**8.99**	<0.001	----	----	----
Selenium	7782-49-2	0.004	mg/L		**0.070**	<0.004	----	----	----
Thorium	7440-29-1	0.001	mg/L		**0.041**	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L		**0.401**	<0.001	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L		**30.1**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L		**0.27**	**0.18**	----	----	----
Iron	7439-89-6	0.05	mg/L		**91.9**	**0.11**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.7**	**2.9**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**68.2**	----	----	----	----
ø Total Anions	----	0.01	meq/L		----	**5.55**	----	----	----
ø Total Cations	----	0.01	meq/L		**57.1**	----	----	----	----
ø Total Cations	----	0.01	meq/L		----	**5.77**	----	----	----
ø Ionic Balance	----	0.01	%		**8.93**	----	----	----	----
ø Ionic Balance	----	0.01	%		----	**1.90**	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**2**	<1	----	----	----
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**1820**	**6**	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: **EB2621399**	Page	: 1 of 6
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2024066 AARC Graphinex KLC's - Stage 4	Date Samples Received	: 12-Jun-2026 17:05
Order number	: ----	Date Analysis Commenced	: 15-Jun-2026
C-O-C number	: ----	Issue Date	: 19-Jun-2026 12:47
Sampler	: ANNA FOURIE		
Site	: ----		
Quote number	: EB24RGSENVCON0002_V2		
No. of samples received	: 7		
No. of samples analysed	: 7		

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.

Signatories	*Position*	*Accreditation Category*
Beatriz Brand	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Beatriz Brand	Senior Chemist	Brisbane Organics, Stafford, QLD
Tatijana Markoska	Senior Chemist - Organics	Brisbane Organics, 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.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for some samples due to analytes not quantified in this report.
- EP005 - (Total Organic Carbon): Results for sample '2024066_KLC1 (EB2621399-001)' may bias low due to large amounts of sediment. The sample was decanted before analysis.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
			Sampling date / time	12-Jun-2026 00:00	12-Jun-2026 00:00	12-Jun-2026 00:00	12-Jun-2026 00:00	12-Jun-2026 00:00
Compound	CAS Number	LOR	Unit	EB2621399-001	EB2621399-002	EB2621399-003	EB2621399-004	EB2621399-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.02**	**8.52**	**7.05**	**5.01**	**3.77**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**22**	**464**	**129**	**316**	**540**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	**8**	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**9**	**214**	**46**	<1	<1
Total Alkalinity as CaCO3	----	1	mg/L	**9**	**222**	**46**	<1	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2**	**31**	**17**	**143**	**240**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	**14**	<1	<1	<1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	**7**	**44**	**47**
Magnesium	7439-95-4	1	mg/L	<1	<1	**1**	**4**	**9**
Sodium	7440-23-5	1	mg/L	**5**	**82**	**18**	**4**	**3**
Potassium	7440-09-7	1	mg/L	<1	**1**	**3**	<1	<1
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.65**	**0.15**	**0.04**	**2.05**	**5.75**
Antimony	7440-36-0	0.001	mg/L	**0.001**	**0.001**	**0.022**	<0.001	<0.001
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.009**	**0.002**	**0.002**	**0.005**
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	**0.002**	**0.007**
Barium	7440-39-3	0.001	mg/L	**0.020**	**0.002**	**0.002**	**0.016**	**0.018**
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	**0.0060**	**0.0021**
Chromium	7440-47-3	0.001	mg/L	**0.001**	**0.005**	<0.001	<0.001	<0.001
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.003**	<0.001	**0.184**	**0.315**
Copper	7440-50-8	0.001	mg/L	**0.008**	**0.025**	<0.001	**0.394**	**0.386**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	2024066_KLC1	2024066_KLC2	2024066_KLC3	2024066_KLC4	2024066_KLC5
				Sampling date / time	12-Jun-2026 00:00	12-Jun-2026 00:00	12-Jun-2026 00:00	12-Jun-2026 00:00	12-Jun-2026 00:00
Compound	CAS Number	LOR	Unit		EB2621399-001	EB2621399-002	EB2621399-003	EB2621399-004	EB2621399-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	**0.018**	**0.016**
Manganese	7439-96-5	0.001	mg/L		**0.006**	**0.003**	**0.002**	**1.68**	**2.71**
Molybdenum	7439-98-7	0.001	mg/L		<0.001	**0.063**	**0.032**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		<0.001	<0.001	<0.001	**0.217**	**0.842**
Selenium	7782-49-2	0.004	mg/L		<0.004	**0.014**	<0.004	<0.004	**0.005**
Thorium	7440-29-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	**0.001**	<0.001	**0.003**	**0.014**
Vanadium	7440-62-2	0.01	mg/L		<0.01	**0.03**	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		**0.064**	<0.005	<0.005	**0.807**	**0.586**
Boron	7440-42-8	0.05	mg/L		<0.05	**0.16**	**0.13**	<0.05	<0.05
Iron	7439-89-6	0.05	mg/L		**0.41**	**0.12**	<0.05	**1.73**	**19.0**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**3.3**	**0.4**	**1.9**	**3.4**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.22**	**5.48**	**1.27**	**2.98**	**5.00**
ø Total Cations	----	0.01	meq/L		**----**	**----**	**----**	**2.93**	**5.08**
ø Total Cations	----	0.01	meq/L		**0.22**	**3.59**	**1.29**	**----**	**----**
ø Ionic Balance	----	0.01	%		**----**	**----**	**----**	**----**	**0.79**
ø Ionic Balance	----	0.01	%		**----**	**20.8**	**----**	**----**	**----**
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**6**	**42**	<1	<1	<1
ED038P: Acidity by Auto Titrator									
Acidity as CaCO3	----	1	mg/L		**4**	<1	**1**	**18**	**82**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
			Sampling date / time	12-Jun-2026 00:00	12-Jun-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2621399-006	EB2621399-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**2.77**	**7.01**	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**3640**	**535**	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	**65**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	<1	**65**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2760**	**189**	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**33**	<1	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**438**	**106**	----	----	----
Magnesium	7439-95-4	1	mg/L	**28**	**4**	----	----	----
Sodium	7440-23-5	1	mg/L	**4**	**4**	----	----	----
Potassium	7440-09-7	1	mg/L	**10**	**9**	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**212**	<0.01	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	----	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.066**	<0.001	----	----	----
Beryllium	7440-41-7	0.001	mg/L	**0.077**	<0.001	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.017**	**0.046**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0809**	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.047**	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**2.88**	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	**5.72**	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	2024066_KLC6	2024066_KLC7	----	----	----
			Sampling date / time	12-Jun-2026 00:00	12-Jun-2026 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2621399-006	EB2621399-007	--------	--------	--------
				Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Lead	7439-92-1	0.001	mg/L	**0.242**	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	**5.67**	**0.507**	----	----	----
Molybdenum	7439-98-7	0.001	mg/L	<0.001	**0.003**	----	----	----
Nickel	7440-02-0	0.001	mg/L	**6.06**	<0.001	----	----	----
Selenium	7782-49-2	0.004	mg/L	**0.063**	<0.004	----	----	----
Thorium	7440-29-1	0.001	mg/L	**0.030**	<0.001	----	----	----
Uranium	7440-61-1	0.001	mg/L	**0.262**	<0.001	----	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L	**19.1**	<0.005	----	----	----
Boron	7440-42-8	0.05	mg/L	**0.18**	**0.13**	----	----	----
Iron	7439-89-6	0.05	mg/L	**48.5**	**0.08**	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**15.2**	**2.7**	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**----**	**5.38**	----	----	----
ø Total Anions	----	0.01	meq/L	**58.4**	**----**	----	----	----
ø Total Cations	----	0.01	meq/L	**50.8**	**----**	----	----	----
ø Total Cations	----	0.01	meq/L	**----**	**6.02**	----	----	----
ø Ionic Balance	----	0.01	%	**6.96**	**5.61**	----	----	----
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	**2**	**2**	----	----	----
ED038P: Acidity by Auto Titrator								
Acidity as CaCO3	----	1	mg/L	**1560**	**5**	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: **EB2611215**	Page	: 1 of 6
Client	: **RGS ENVIRONMENTAL CONSULTANTS PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MELINDA HILTON	Contact	: Carsten Emrich
Address	: 45 ROSEDALE STREET COOPERS PLAINS 4108	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3344 1222	Telephone	: +61 7 3552 8616
Project	: 2026029 - Graphinex EIS	Date Samples Received	: 27-Mar-2026 16:43
Order number	: 2026029	Date Analysis Commenced	: 31-Mar-2026
C-O-C number	: ----	Issue Date	: 14-May-2026 10:40
Sampler	: KOSHIK GOUNDER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

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- 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 External Subcontracting, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Soil Preparation, Stafford, QLD

General Comments

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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.

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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.

- Particular samples have been crushed prior to preparation and analysis as per client request on the Chain of Custody. Please refer to SRN for further details.
- Prague Report Comment (ALS Sample 001, Gross alpha & beta activity): LOR was increased due to high salinity of the sample(s).
- Radiological work undertaken by ALS Laboratory Group (Ceska Lipa) under CAI accreditation No. L1163. Report No. PR2638952. NATA and CAI accreditations' are both recognised under ILAC.
- Radiological work undertaken by ALS Laboratory Group (Ceska Lipa) under CAI accreditation No. L1163. Report No. PR2638035. NATA and CAI accreditations' are both recognised under ILAC.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	2026029_C101 Soil	2026029_C102 Overburden	2026029_C103 Low Grade Ore	2026029_C104 Waste rock	2026029_C105 Ore body
			Sampling date / time	27-Mar-2026 00:00	27-Mar-2026 00:00	27-Mar-2026 00:00	27-Mar-2026 00:00	27-Mar-2026 00:00
Compound	CAS Number	LOR	Unit	EB2611215-001	EB2611215-002	EB2611215-003	EB2611215-004	EB2611215-005
				Result	Result	Result	Result	Result
EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)								
Extraction Fluid Number	----	1	-	**1**	**1**	**1**	**1**	**1**
Final pH	----	0.1	pH Unit	**4.9**	**4.9**	**5.0**	**4.9**	**4.9**
Radionuclides / Activity								
Uranium 238	7440-61-1	10.0	Bq/kg DW	**17.0**	**27.0**	**79.0**	**126**	**95.0**
Thorium 234	----	10.0	Bq/kg DW	**17.0**	**27.0**	**79.0**	**126**	**95.0**
Thorium 230	----	50	Bq/kg DW	<70	<95	<150	**135**	<140
Radium 226	13982-63-3	1.0	Bq/kg DW	**14.1**	**25.2**	**86.4**	**125**	**96.7**
Lead 210	14255-04-0	50	Bq/kg DW	<50	<50	**60**	**84**	**72**
Uranium 235	15117-96-1	1.0	Bq/kg DW	**1.1**	**1.9**	**3.9**	**7.1**	**5.1**
Protactinium 231	----	5	Bq/kg DW	<7.5	<11.0	<16.0	<20.0	<28.0
Actinium 227	----	1	Bq/kg DW	<1.8	<2.3	<4.5	**----**	<8.8
Actinium 227	----	1.0	Bq/kg DW	**----**	**----**	**----**	**7.1**	**----**
Thorium 227	----	1	Bq/kg DW	<1.8	<2.3	<4.5	**----**	<8.8
Thorium 227	----	1.0	Bq/kg DW	**----**	**----**	**----**	**7.1**	**----**
Radium 223	----	1	Bq/kg DW	<2.1	<2.8	<3.8	**----**	<11.0
Radium 223	----	1.0	Bq/kg DW	**----**	**----**	**----**	**7.2**	**----**
Radium 228	7440-14-4	1.0	Bq/kg DW	**18.5**	**36.0**	**95.3**	**85.5**	**83.2**
Thorium 228	----	1.0	Bq/kg DW	**19.8**	**36.9**	**94.2**	**82.1**	**83.0**
Potassium 40	13966-00-2	10	Bq/kg DW	**54**	**485**	**973**	**1350**	**1200**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	2026029_C106 Tailings - Batch 2	----	----	----	----
				Sampling date / time	27-Mar-2026 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2611215-006	--------	--------	--------	--------
					Result	----	----	----	----
EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)									
Extraction Fluid Number	----	1	-		**1**	----	----	----	----
Final pH	----	0.1	pH Unit		**4.9**	----	----	----	----
Radionuclides / Activity									
Uranium 238	7440-61-1	10.0	Bq/kg DW		**67.0**	----	----	----	----
Thorium 234	----	10.0	Bq/kg DW		**67.0**	----	----	----	----
Thorium 230	----	50	Bq/kg DW		<130	----	----	----	----
Radium 226	13982-63-3	1.0	Bq/kg DW		**73.6**	----	----	----	----
Lead 210	14255-04-0	50	Bq/kg DW		**56**	----	----	----	----
Uranium 235	15117-96-1	1.0	Bq/kg DW		**4.1**	----	----	----	----
Protactinium 231	----	5	Bq/kg DW		<13.0	----	----	----	----
Actinium 227	----	1	Bq/kg DW		<2.9	----	----	----	----
Thorium 227	----	1	Bq/kg DW		<2.9	----	----	----	----
Radium 223	----	1	Bq/kg DW		<3.5	----	----	----	----
Radium 228	7440-14-4	1.0	Bq/kg DW		**69.7**	----	----	----	----
Thorium 228	----	1.0	Bq/kg DW		**70.2**	----	----	----	----
Potassium 40	13966-00-2	10	Bq/kg DW		**1320**	----	----	----	----

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	2026029_C101 Soil	2026029_C102 Overburden	2026029_C103 Low Grade Ore	2026029_C104 Waste rock	2026029_C105 Ore body
				Sampling date / time	27-Mar-2026 00:00	27-Mar-2026 00:00	27-Mar-2026 00:00	27-Mar-2026 00:00	27-Mar-2026 00:00
					EB2611215-001	EB2611215-002	EB2611215-003	EB2611215-004	EB2611215-005
					Result	Result	Result	Result	Result
Radionuclides / Activity									
Gross alpha	----	0.04	Bq/L		<0.08	**0.23**	**0.56**	**0.74**	**0.34**
Gross beta activity - 40K	----	0.1	Bq/L		<0.23	<0.10	**----**	**----**	**----**
Gross beta activity - 40K	----	0.10	Bq/L		**----**	**----**	**0.53**	**0.33**	**0.55**
Gross beta	----	0.1	Bq/L		<0.26	**----**	**----**	**----**	**----**
Gross beta	----	0.10	Bq/L		**----**	**0.32**	**0.71**	**0.47**	**0.66**

Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)				Sample ID	2026029_C106 Tailings - Batch 2	----	----	----	----
				Sampling date / time	27-Mar-2026 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2611215-006	--------	--------	--------	--------
					Result	----	----	----	----
Radionuclides / Activity									
Gross alpha	----	0.04	Bq/L		**0.48**	**----**	**----**	**----**	**----**
Gross beta activity - 40K	----	0.10	Bq/L		**0.55**	**----**	**----**	**----**	**----**
Gross beta	----	0.10	Bq/L		**0.72**	**----**	**----**	**----**	**----**

Attachment F: Trilab laboratory certificates

Brisbane
346A Bilsen Road,
Geebung
QLD 4034
Ph: +61 7 3265 5656

Perth
2 Kimmer Place,
Queens Park
WA 6107
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ATTERBERG LIMITS TEST REPORT

Test Methods: AS 1289 2.1.1, 3.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	RGS Environmental Consultants Pty Ltd	**Report No.**	25046304-ATT
		Workorder No.	9919/T/25-130
Address	45 Rosedale Street Coopers Plains QLD 4108	**Report Date**	10/06/2025
Project	2024066 AARC Graphinex KLC's		

Sample No.	25046304
Liquid Limit Determination	AS 1289.3.1.1
Test Date	4/06/2025
Client ID	2024066_001
Location	2024066
Depth (m)	Not Supplied
Description	Tailings Solid - Tank 1
Method of Preparation	Oven Dried
Liquid Limit (%)	Non-obtainable
Plastic Limit (%)	Non-obtainable
Plasticity Index (%)	Non-plastic
Linear Shrinkage (%)	Non-obtainable
Cracking or Curling	Niether
Moisture Content (%)	1.5

NOTES/REMARKS:

Sample/s supplied by the client

Accredited for compliance with ISO/IEC 17025 - Testing

*NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates

Tested at Trilab Brisbane Laboratory

Approved Signatory

Michael Ferguson

Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

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Perth
2 Kimmer Place,
Queens Park
WA 6107
Ph: +61 8 9258 8323

ATTERBERG LIMITS TEST REPORT

Test Methods: AS 1289 2.1.1, 3.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	RGS Environmental Consultants Pty Ltd	**Report No.**	25046305-ATT
		Workorder No.	9919/T/25-130
Address	45 Rosedale Street Coopers Plains QLD 4108	**Report Date**	10/06/2025
Project	2024066 AARC Graphinex KLC's		

Sample No.	25046305
Liquid Limit Determination	AS 1289.3.1.1
Test Date	4/06/2025
Client ID	2024066_002
Location	2024066
Depth (m)	Not Supplied
Description	Tailings Solid - Tank 2
Method of Preparation	Oven Dried
Liquid Limit (%)	Non-obtainable
Plastic Limit (%)	Non-obtainable
Plasticity Index (%)	Non-plastic
Linear Shrinkage (%)	Non-obtainable
Cracking or Curling	Niether
Moisture Content (%)	2.0

NOTES/REMARKS:

Sample/s supplied by the client

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Tested at Trilab Brisbane Laboratory

Approved Signatory

Michael Ferguson

Laboratory No. 9926

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Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

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ATTERBERG LIMITS TEST REPORT

Test Methods: AS 1289 2.1.1, 3.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1

Client	RGS Environmental Consultants Pty Ltd	**Report No.**	25046306-ATT
		Workorder No.	9919/T/25-130
Address	45 Rosedale Street Coopers Plains QLD 4108	**Report Date**	10/06/2025
Project	2024066 AARC Graphinex KLC's		

Sample No.	25046306
Liquid Limit Determination	AS 1289.3.1.1
Test Date	4/06/2025
Client ID	2024066_003
Location	2024066
Depth (m)	Not Supplied
Description	Tailings Solid - Tank 3
Method of Preparation	Oven Dried
Liquid Limit (%)	Non-obtainable
Plastic Limit (%)	Non-obtainable
Plasticity Index (%)	Non-plastic
Linear Shrinkage (%)	Non-obtainable
Cracking or Curling	Niether
Moisture Content (%)	4.6

NOTES/REMARKS:

Sample/s supplied by the client

Accredited for compliance with ISO/IEC 17025 - Testing

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Tested at Trilab Brisbane Laboratory

Approved Signatory

Michael Ferguson

Laboratory No. 9926

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Trilab Pty Ltd ABN 25 065 630 506

ACCURATE QUALITY RESULTS FOR TOMORROW'S ENGINEERING

Trilab
Soil Rock Calibration

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Ph: +61 7 3265 5656

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2 Kimmer Place,
Queens Park
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Ph: +61 8 9258 8323

PERMEABILITY BY FALLING HEAD TEST REPORT

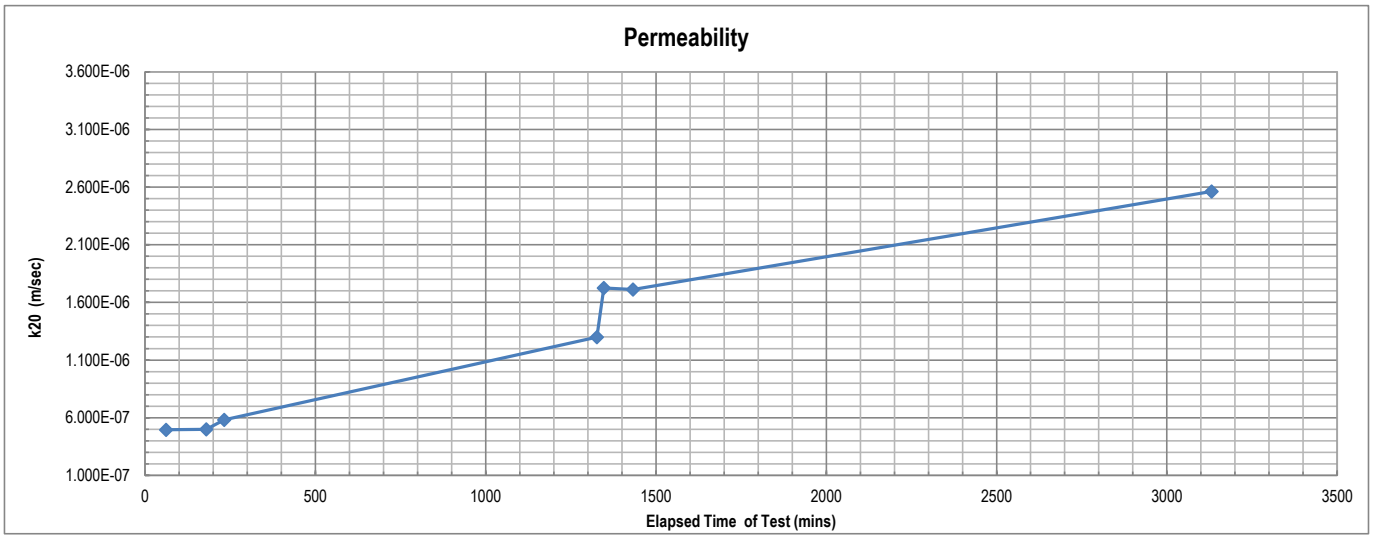
Test Method AS 1289 6.7.2, 5.1.1

Client	RGS Environmental Consultants Pty Ltd	**Report No.**	25046307-FPER
		Workorder No.	9919/T/25-130
Address	45 Rosedale Street Coopers Plains QLD 4108	**Test Date**	4/06/2025
		Report Date	11/06/2025
Project	2024066 AARC Graphinex KLC's		
Client ID	2024066_C101	**Depth (m)**	Not Supplied
Description	Tailings Composite	**Sample Type**	Remoulded Soil Specimen

RESULTS OF TESTING

Compaction Method	**N/A**		
Maximum Dry Density (t/m^3)	**N/A**	Hydraulic Gradient	**11.2**
Optimum Moisture Content (%)	**N/A**	Surcharge (kPa)	**2.9**
Placement Moisture Content (%)	**2.0**	Head Pressure Applied (kPa)	**12.75**
Moisture Ratio (%)	**N/A**	Water Type	**Deaerated**
Placement Wet Density (t/m^3)	**1.48**	Percentage Material Retained/Sieve Size (mm)	**0 % /19 mm**
Density Ratio (%)	**N/A**	Sample Height and Diameter (mm)	**116.12 / 101.37 mm**

PERMEABILITY $k_{(20)} =$ **2.6×10^{-06}** **(m/sec)**



Remarks: The above specimen was lightly tamped at the received moisture content as instructed by client.

Sample/s supplied by client

Accredited for compliance with ISO/IEC 17025 - Testing

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Tested at Trilab Brisbane Laboratory

Approved Signatory

Wade Els

Wade Els

NATA WORLD RECOGNISED ACCREDITATION

Laboratory No. 9926

The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated.
Reference should be made to Trilab's "Standard Terms and Conditions of Business" for further details.
Trilab Pty Ltd ABN 25 065 630 506

Attachment G: Biotrack laboratory certificates

www.biotrack.com.au
781 Mt Glorious Rd Highvale 4520

Certificate of Analysis

Signatory:

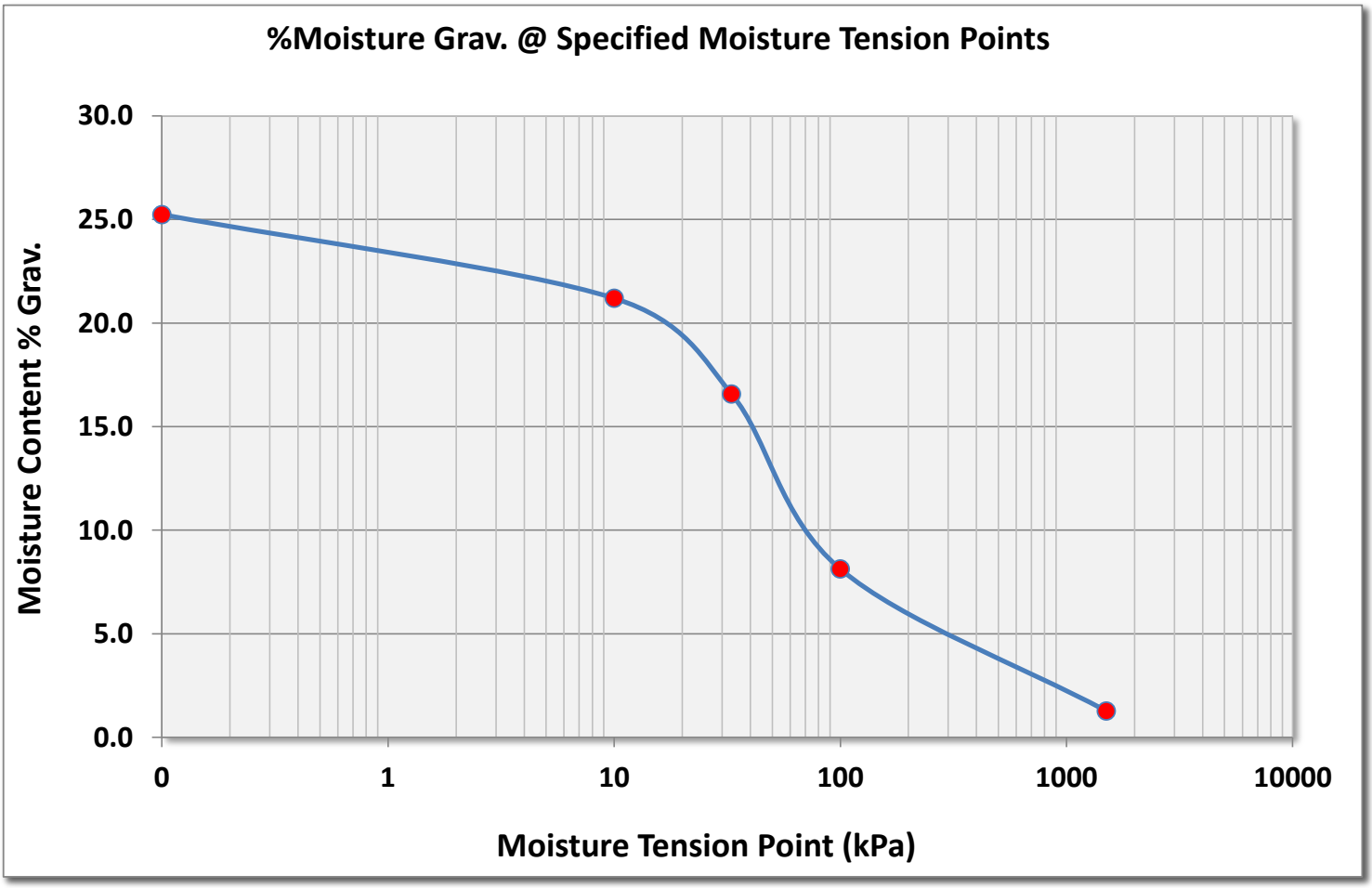
Phone: +617 3289 7179 Bio-Track Pty Ltd ABN 91 056 237 275

Test Code/Name	[449] Moisture Retention Curve - Soil		
Lab Reference (LR)	**151124.634**	Client Name	RGS Environmental Consultants Pty Ltd
SampleID(s)	**Tailings Batch 1 Composite (2023072)**	Client Contact	Melinda Hilton
		Project Name	AARC Graphinex - Stage 3
Report Date	25/11/2024	Job Number	2023072
Sample Received Date	15/11/2024	Order Number	
Sample Disposal Date	14/01/2025	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	melinda@rgsenv.com
Temperature	Ambient	Client Address	3/30 Lensworth St Coopers Plains Brisbane Queensland 4108

Method:
- **Sample oven dried @ 85°C, sieved < 10mm**
- **Available Water (%Grav.) = Field Capacity (%Grav.) - Wilting Point (%Grav.)**
- **Moisture Content calculated using Moisture Tension Plate**

Disclaimer: This analysis report is prepared solely for the client listed above. To the extent permitted by law, Bio-Track Pty Ltd excludes all liability in connection with this report and, where liability cannot be excluded, limits its liability, at its election, to the re-supply of the analysis services or the cost of the re-supply of such services.

SampleID/Results	%Moisture @ Specified Moisture Tension Points										
Tailings Batch 1 Composite (2023072)	0 kPa (0 Bar)	1 kPa (0.01 Bar)	10 kPa (0.1 Bar)	33 kPa (0.33 Bar)	50 kPa (0.5 Bar)	100 kPa (1 Bar)	300 kPa (3 Bar)	500 kPa (5 Bar)	1000 kPa (10 Bar)	1500 kPa (15 Bar)	Available Water % Grav.
%Moisture Grav.	25.2	*NM	21.2	16.6	*NM	8.1	*NM	*NM	*NM	1.3	19.9



www.biotrack.com.au
781 Mt Glorious Rd Highvale 4520

Certificate of Analysis

Signatory:

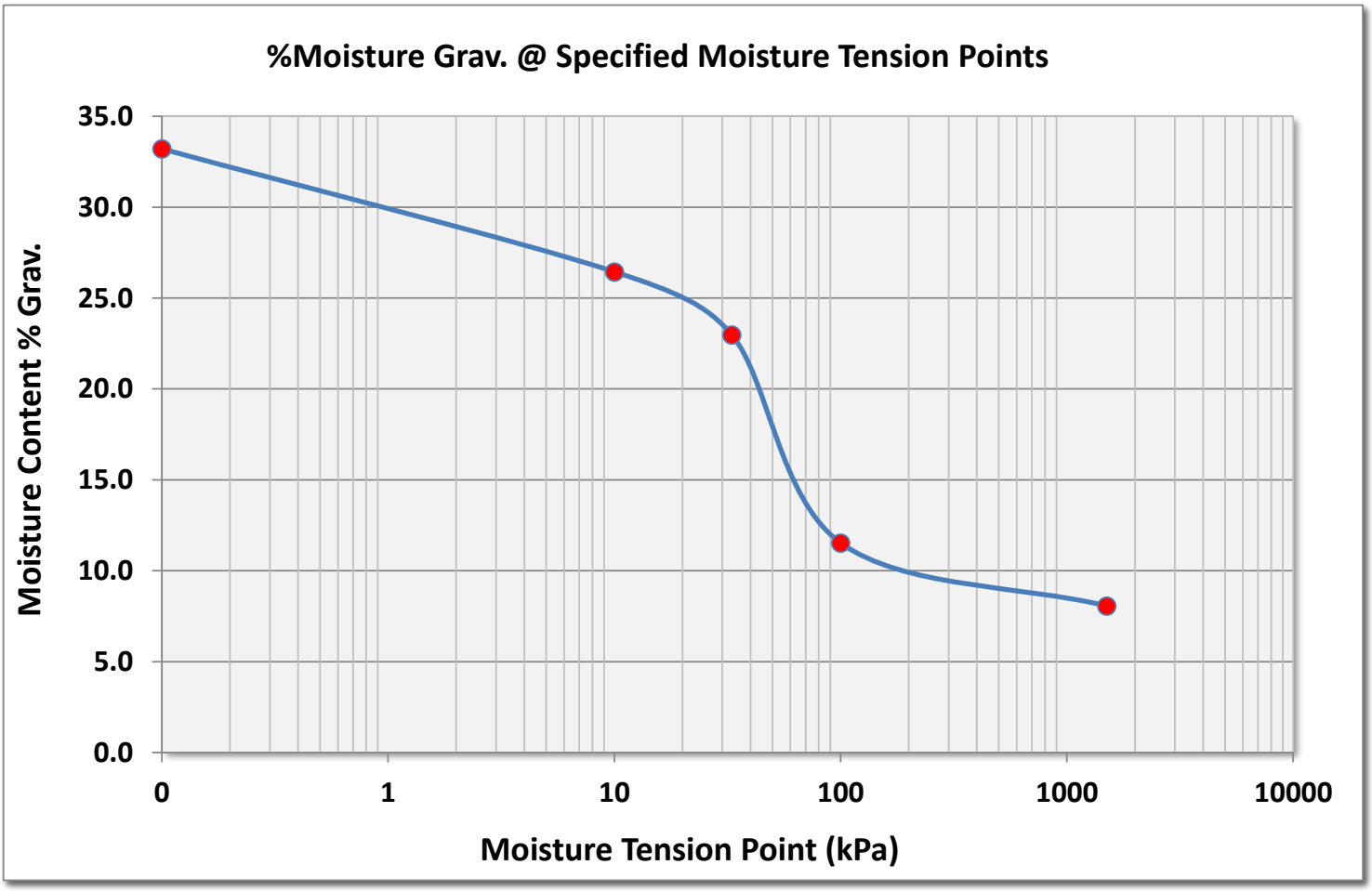
Phone: +617 3289 7179 Bio-Track Pty Ltd ABN 91 056 237 275

Test Code/Name	[449] Moisture Retention Curve - Soil		
Lab Reference (LR)	**110425.592**	Client Name	RGS Environmental Consultants Pty Ltd
SampleID(s)	**2024066_C101 - Tailings Batch 2 Composite**	Client Contact	Melinda Hilton
		Project Name	AARC Graphinex - KLCs
Report Date	22/04/2025	Job Number	2024066
Sample Received Date	11/04/2025	Order Number	
Sample Disposal Date	10/06/2025	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	melinda@rgsenv.com
Temperature	Ambient	Client Address	3/30 Lensworth St Coopers Plains Brisbane Queensland 4108

Method:
- Sample oven dried @ 85°C, sieved < 10mm
- Available Water (%Grav.) = Field Capacity (%Grav.) - Wilting Point (%Grav.)
- Moisture Content calculated using Moisture Tension Plate
***NM = not measured**

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SampleID/Results	%Moisture @ Specified Moisture Tension Points										
2024066_C101 - Tailings Batch 2 Composite	0 kPa (0 Bar)	1 kPa (0.01 Bar)	10 kPa (0.1 Bar)	33 kPa (0.33 Bar)	50 kPa (0.5 Bar)	100 kPa (1 Bar)	300 kPa (3 Bar)	500 kPa (5 Bar)	1000 kPa (10 Bar)	1500 kPa (15 Bar)	Available Water % Grav.
%Moisture Grav.	33.2	*NM	26.4	23.0	*NM	11.5	*NM	*NM	*NM	8.1	18.4



Attachment H: X-Ray Vision laboratory certificates

X-ray Vision Australia Pty Ltd
ABN 16 077 701 912
PO Box 8195
Northland Center VIC 3072
M 0418 119 094
E chris.kelaart@xva.com.au

RGS Environmental Consultants Pty Ltd
45 Rosedale Street
Coopers Plains QLD 4108

Attention: Melinda Hilton

January 7, 2025

Report Number: LS3269

Quantitative Analysis of Graphinex Samples

Introduction:

Eleven samples of Graphinex material were submitted for qualitative and quantitative phase analysis using X-ray diffraction (XRD).

Sampling & Preparation:

No sampling information was available for the samples submitted. The samples were supplied in a powder form and analysed without further crushing. The samples were mixed with 20% w/w of zinc oxide to determine the non-crystalline (amorphous) component.

Analytical Method:

The XRD patterns were produced using a Bruker-AXS D8 Endeavor XRD with copper radiation at 40 kV and 25 mA, over a range of 5 to 80 degrees 2θ, with an approximately 0.02 degree step and an effective 91 second per step count time using a Lynx-Eye XE-T detector.

Identification of phases present was carried out using Bruker EVA Search/Match software and the ICDD PDF-5+ database (2025) with SIROQUANT version 5 software used to further characterize the samples.

Results:

The XRD scans are attached including the Search/Match information.

Note that the intensity of the peaks in an XRD pattern depend upon the crystallinity as well as the concentration of the phase.

The quantitative results are summarised in the following tables:

	XVA ID:	LS3269-01	LS3269-02
	Customer ID:	2023072_C01	2023072_C02
Phase Name/Formula	**ICDD Ref**	**Weight %**	**Weight %**
Quartz; SiO_2	00-046-1045	77	56
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	Trace	3
Kaolinite; $Al_2Si_2O_5(OH)_4$	00-014-0164	Trace	8
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	ND	ND
Mixed Layer Illite/Smectite	00-007-0330	ND	27
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	ND	Poss. Trace
Potassium Feldspar; KAl_3SiO_8	00-031-0966	Trace	1
Pyrite; FeS_2	00-042-1340	ND	ND
Anatase; TiO_2	00-021-1272	ND	Trace
Amorphous Material	N/A	23	5

	XVA ID:	LS3269-03	LS3269-04
	Customer ID:	2023072_C03	2023072_C04
Phase Name/Formula	**ICDD Ref**	**Weight %**	**Weight %**
Quartz; SiO_2	00-046-1045	66	25
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	5	4
Kaolinite; $Al_2Si_2O_5(OH)_4$	00-014-0164	8	19
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	1	6
Mixed Layer Illite/Smectite	00-007-0330	10	7
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	3	1
Potassium Feldspar; KAl_3SiO_8	00-031-0966	5	7
Pyrite; FeS_2	00-042-1340	ND	ND
Anatase; TiO_2	00-021-1272	Poss. Trace	Trace
Amorphous Material	N/A	2	31

	XVA ID:	LS3269-05	LS3269-06
	Customer ID:	2023072_C05	2023072_C06
Phase Name/Formula	**ICDD Ref**	**Weight %**	**Weight %**
Quartz; SiO_2	00-046-1045	31	30
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	19	7
Kaolinite; $Al_2Si_2O_5(OH)_4$	00-014-0164	13	ND
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	3	7
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	2	8
Potassium Feldspar; KAl_3SiO_8	00-031-0966	7	5
Anatase; TiO_2	00-021-1272	Trace	Poss. Trace
Clinozoisite; $Ca_2Al_3(SiO_4)(Si_2O_7)O(OH)$	00-044-1400	1	5
Amorphous Material	N/A	24	38

	XVA ID:	LS3269-07	LS3269-08
	Customer ID:	2023072_C07	2023072_C08
Phase Name/Formula	**ICDD Ref**	**Weight %**	**Weight %**
Quartz; SiO_2	00-046-1045	33	20
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	7	16
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	9	24
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	9	10
Potassium Feldspar; KAl_3SiO_8	00-031-0966	6	4
Anatase; TiO_2	00-021-1272	Poss. Trace	Possible
Clinozoisite; $Ca_2Al_3(SiO_4)(Si_2O_7)O(OH)$	00-044-1400	1	Poss. Trace
Calcite; magnesian; $(Ca, Mg)CO_3$	01-089-1304	ND	2
Graphite; C	00-023-0064	17	14
Amorphous Material	N/A	18	10

	XVA ID:	LS3269-09	LS3269-10
	Customer ID:	2023072_C09	2023072_C10
Phase Name/Formula	**ICDD Ref**	**Weight %**	**Weight %**
Quartz; SiO_2	00-046-1045	26	28
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	3	3
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	19	11
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	10	11
Potassium Feldspar; KAl_3SiO_8	00-031-0966	6	8
Pyrite; FeS_2	00-042-1340	1	Trace
Graphite; C	00-023-0064	25	26
Amorphous Material	N/A	10	13

	XVA ID:	LS3269-11
	Customer ID:	2023072_C11
Phase Name/Formula	**ICDD Ref**	**Weight %**
Quartz; SiO_2	00-046-1045	23
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	2
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	13
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	14
Potassium Feldspar; KAl_3SiO_8	00-031-0966	7
Pyrite; FeS_2	00-042-1340	ND
Clinozoisite; $Ca_2Al_3(SiO_4)(Si_2O_7)O(OH)$	00-044-1400	Poss. Trace
Graphite; C	00-023-0064	20
Amorphous Material	N/A	21

Discussion:

The results of the analysis are summarised in the tables and scans attached. Results are given as % of the total.

Note that where the Cu Kβ and W Lα artifact lines are visible in the scan below for the more intense diffraction lines, these are included along with the primary line.

While some of the fits of the more highly crystalline peaks were not ideal, the quantifications appear to be in line with the overall intensities observed.

Quantification of the crystalline mineral phases was performed with the SIROQUANT™ software package. This software uses the full-profile Rietveld method of refining the profile of the calculated XRD pattern against the profile of the measured XRD pattern. The total calculated pattern is the sum of the calculated patterns of the individual phases. Results are given as weight % of the total.

Corrections are incorporated in the process that allows for a more accurate description of the mineral's contribution to the measured pattern and to allow for variation due to atomic substitution, layer disordering, preferred orientation, and other factors that affect the acquisition of the XRD scan.

The limitations of qualitative XRD analysis are as follows:

1. There is a limit of detection of 1-2% on most crystalline phases.
2. Where there exist multiple phases, overlap of diffracted reflections can occur, thus rendering some ambiguity into the interpretation.
3. Some phases cannot be unambiguously identified as they are present in minor or trace amounts.

The limitations of quantitative XRD analysis by a full-profile Rietveld method are as follows:

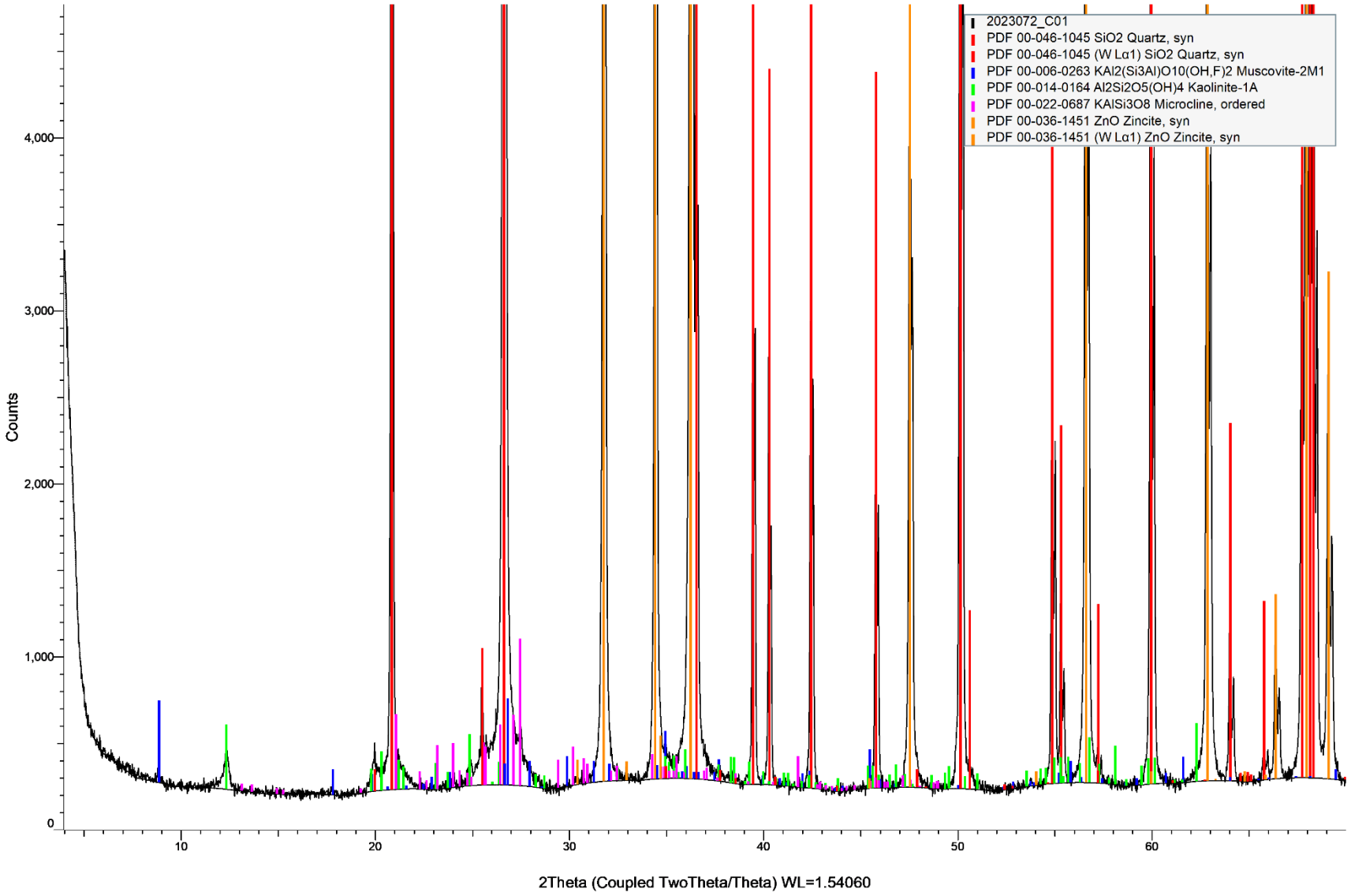
1. The limitations for qualitative XRD analysis all apply
2. The method as described is standardless as it relies solely on the published crystallographic data available for each phase. Some crystallographic data may not exactly describe the phases present.
3. Results are normalized to 100% and do not include estimates of unidentified or amorphous materials unless otherwise stated.

Potential limitations on the quantitative analysis can also include effects from varying crystallinity of each mineral, their preferred orientation in the sample preparation and their differing absorption of the X-rays.

Christopher Kelaart
X-Ray Vision Australia Pty Ltd

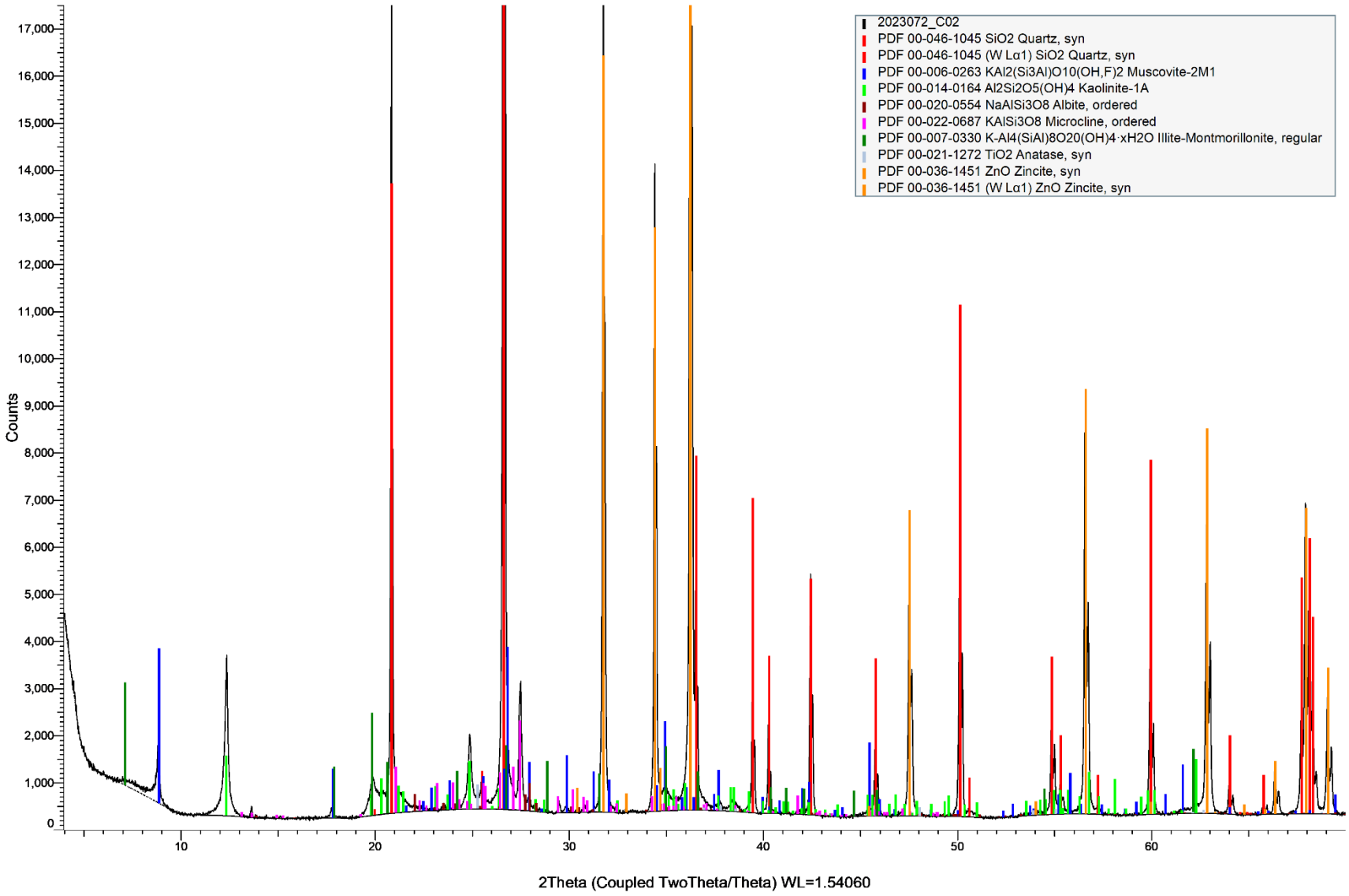
X-RAYvision AUSTRALIA

LS3269-01



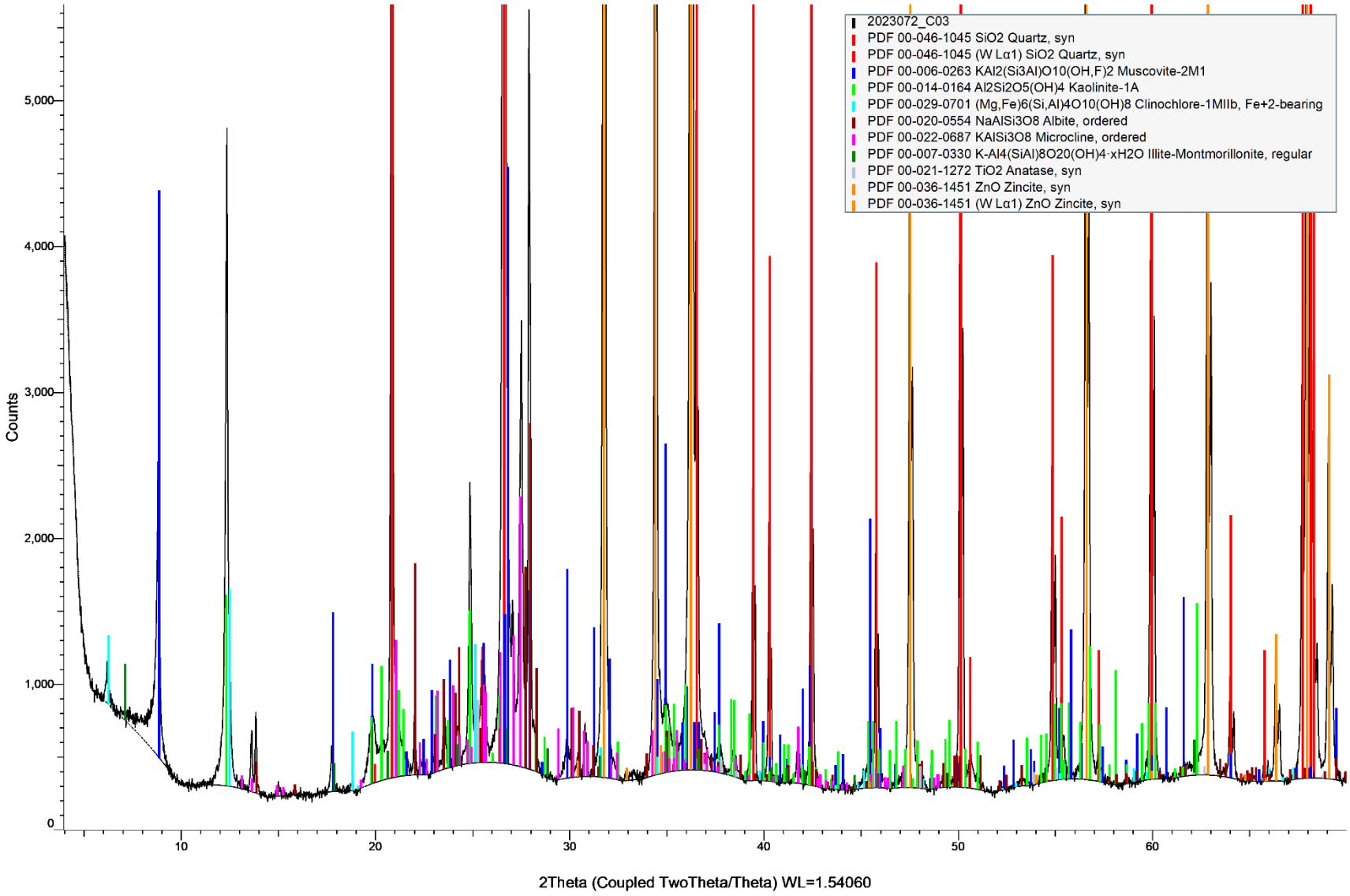
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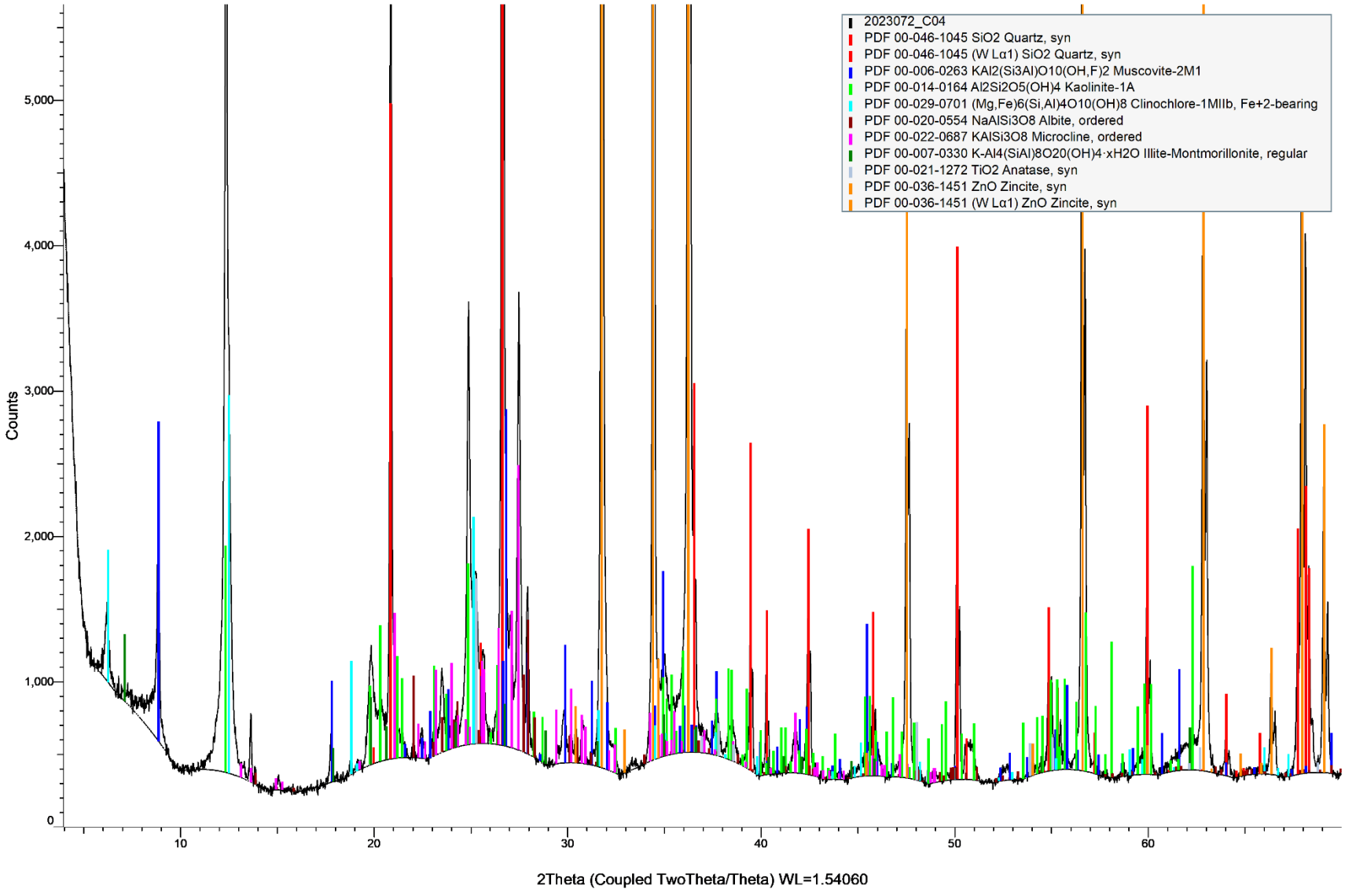
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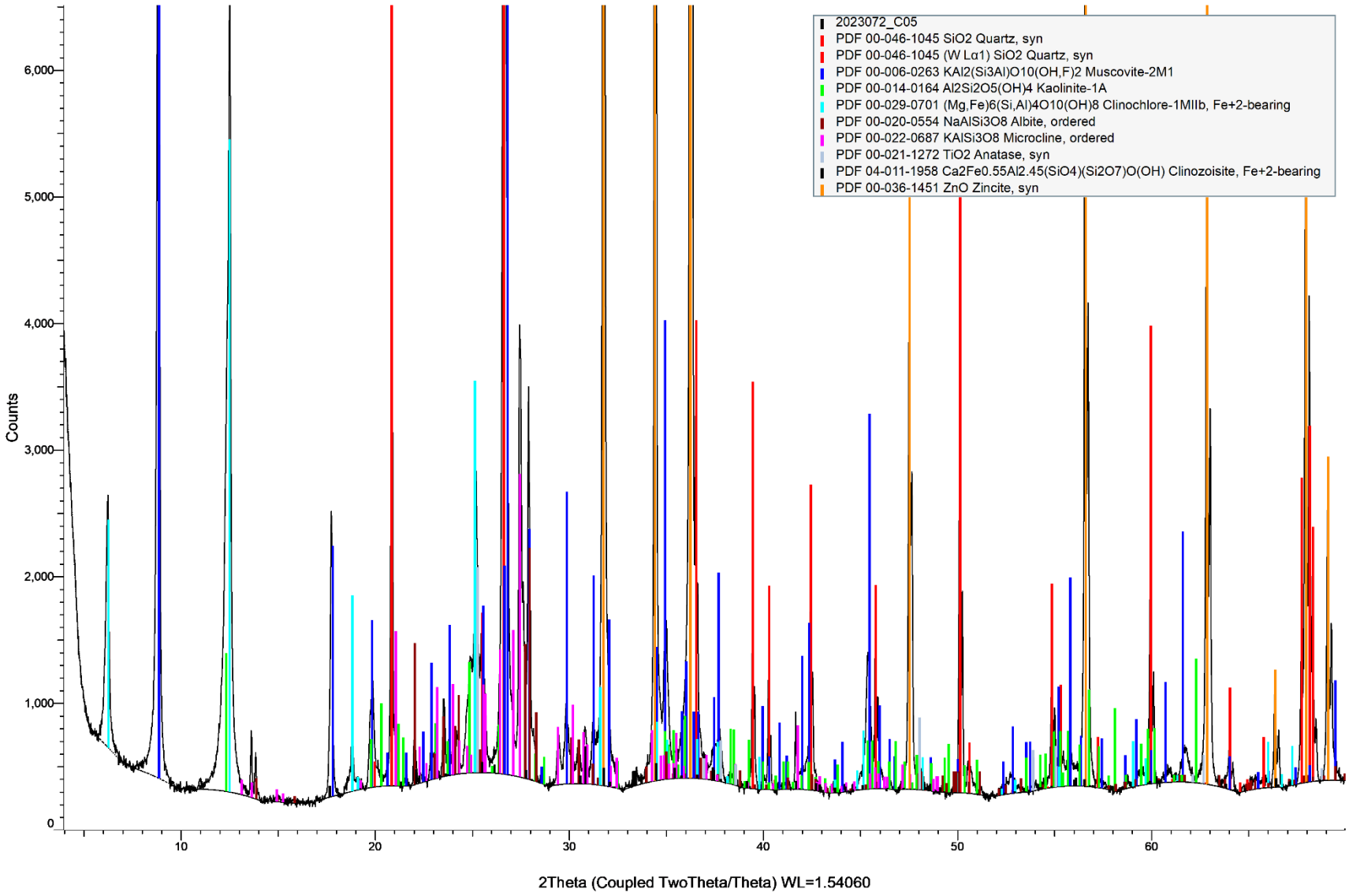
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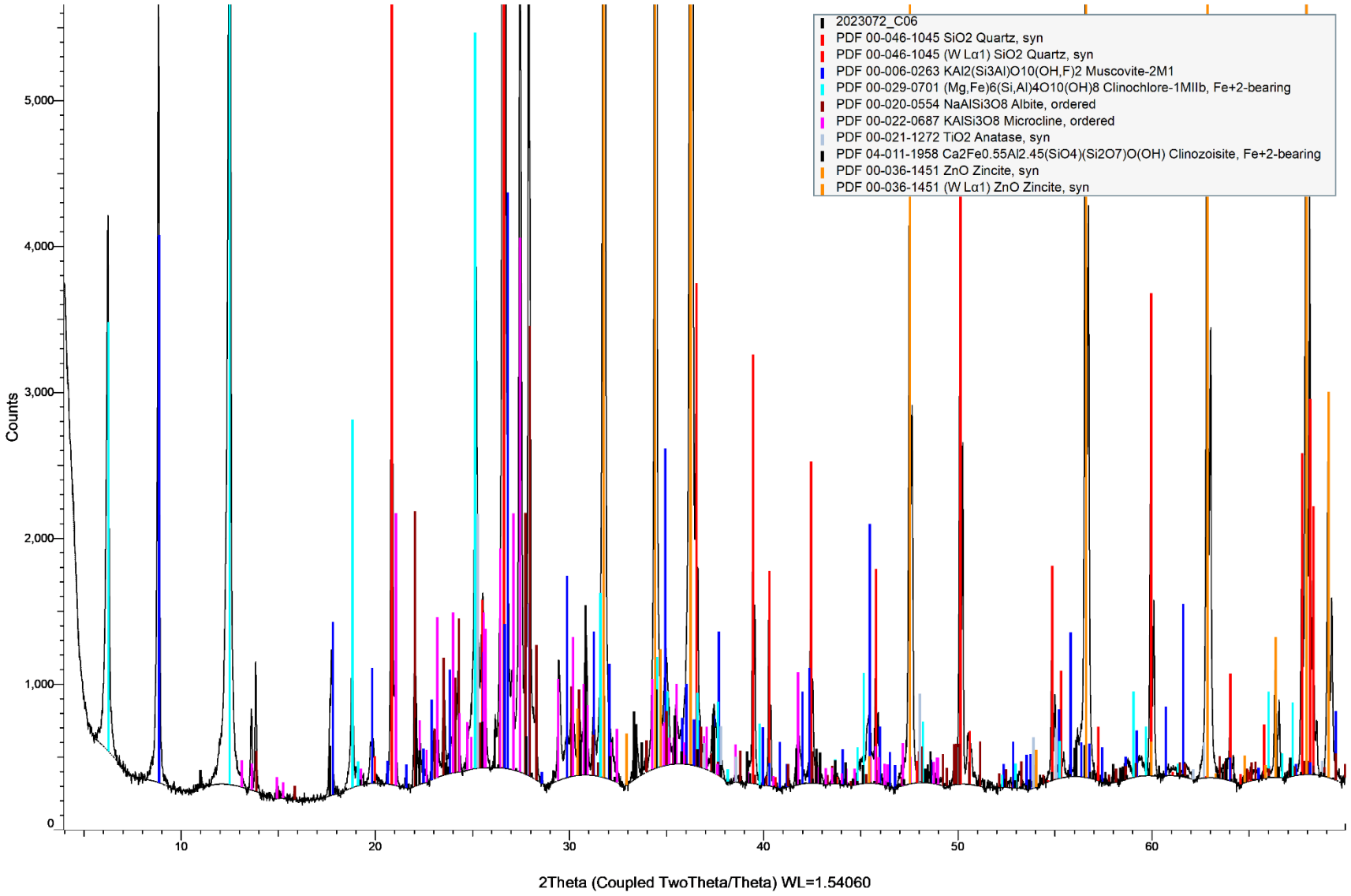
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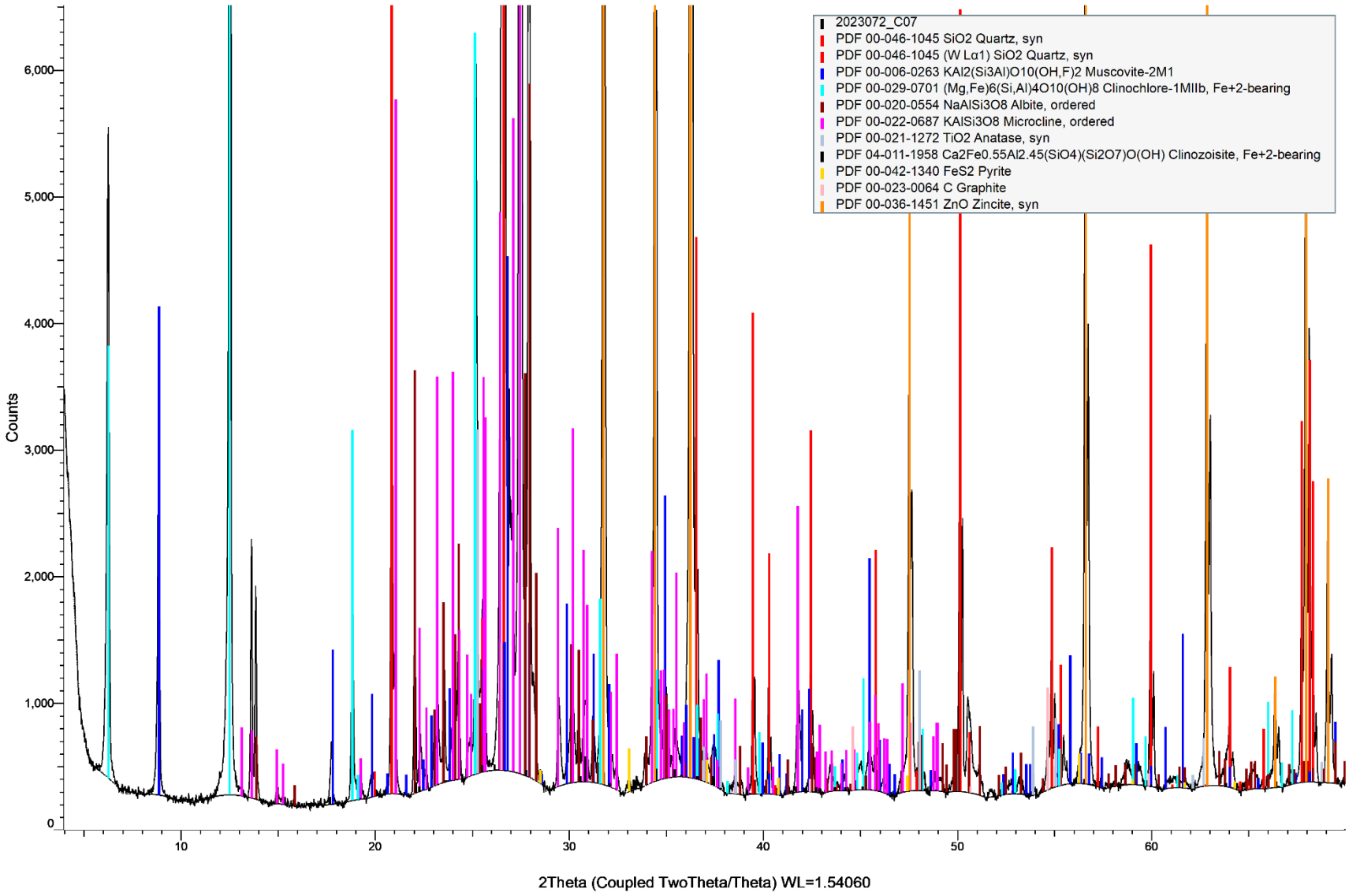
X-RAYvision
AUSTRALIA

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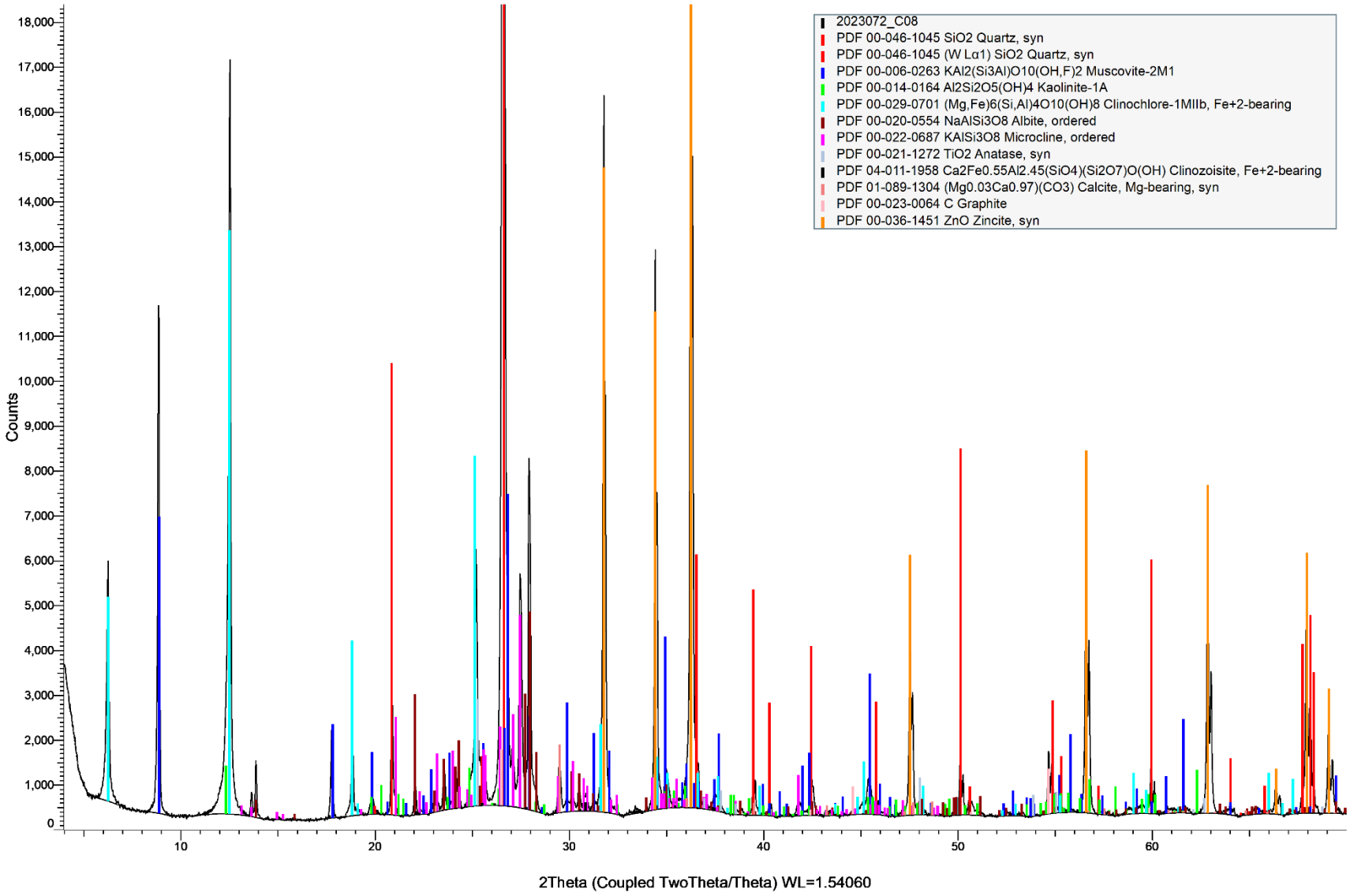
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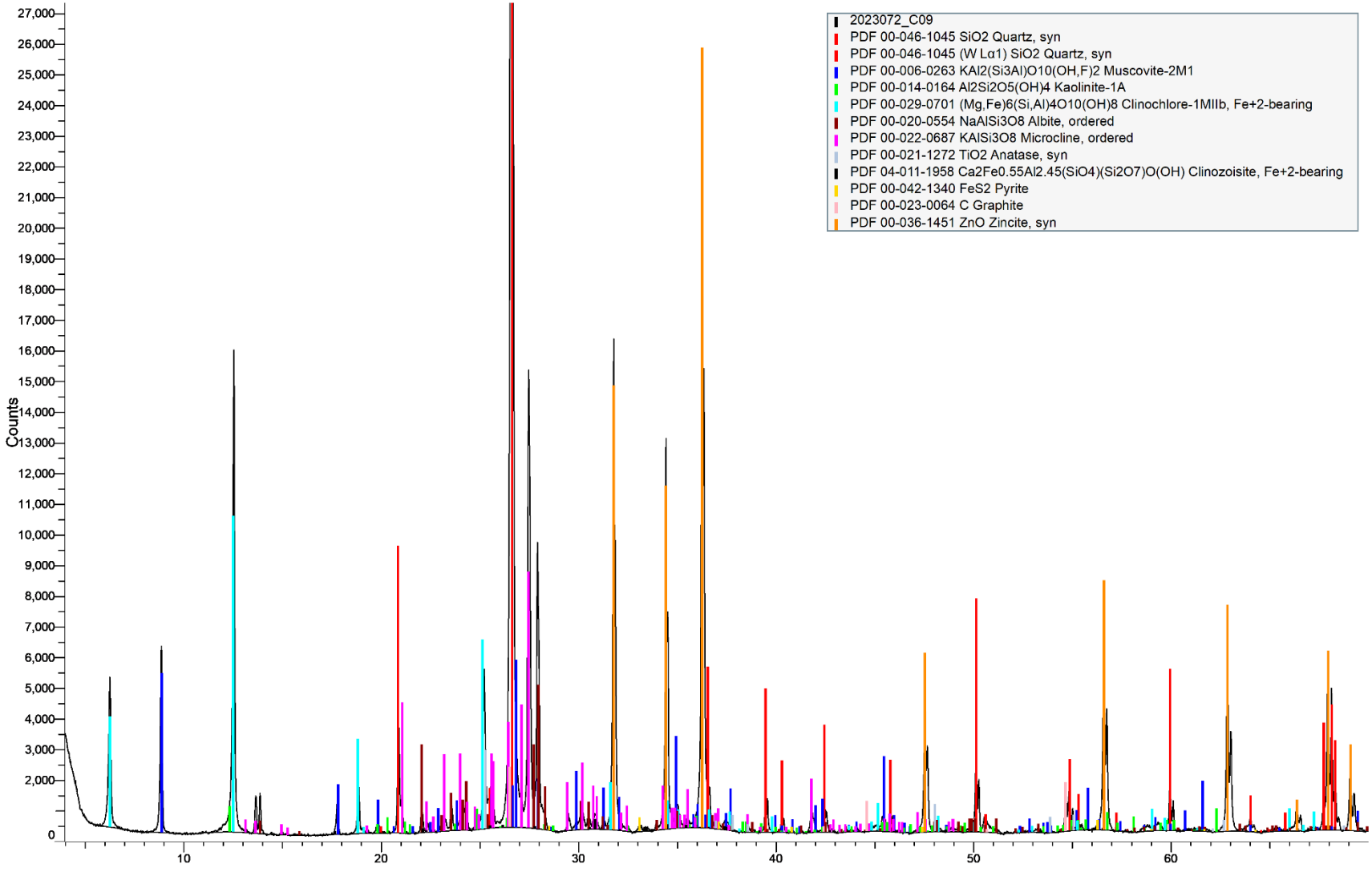
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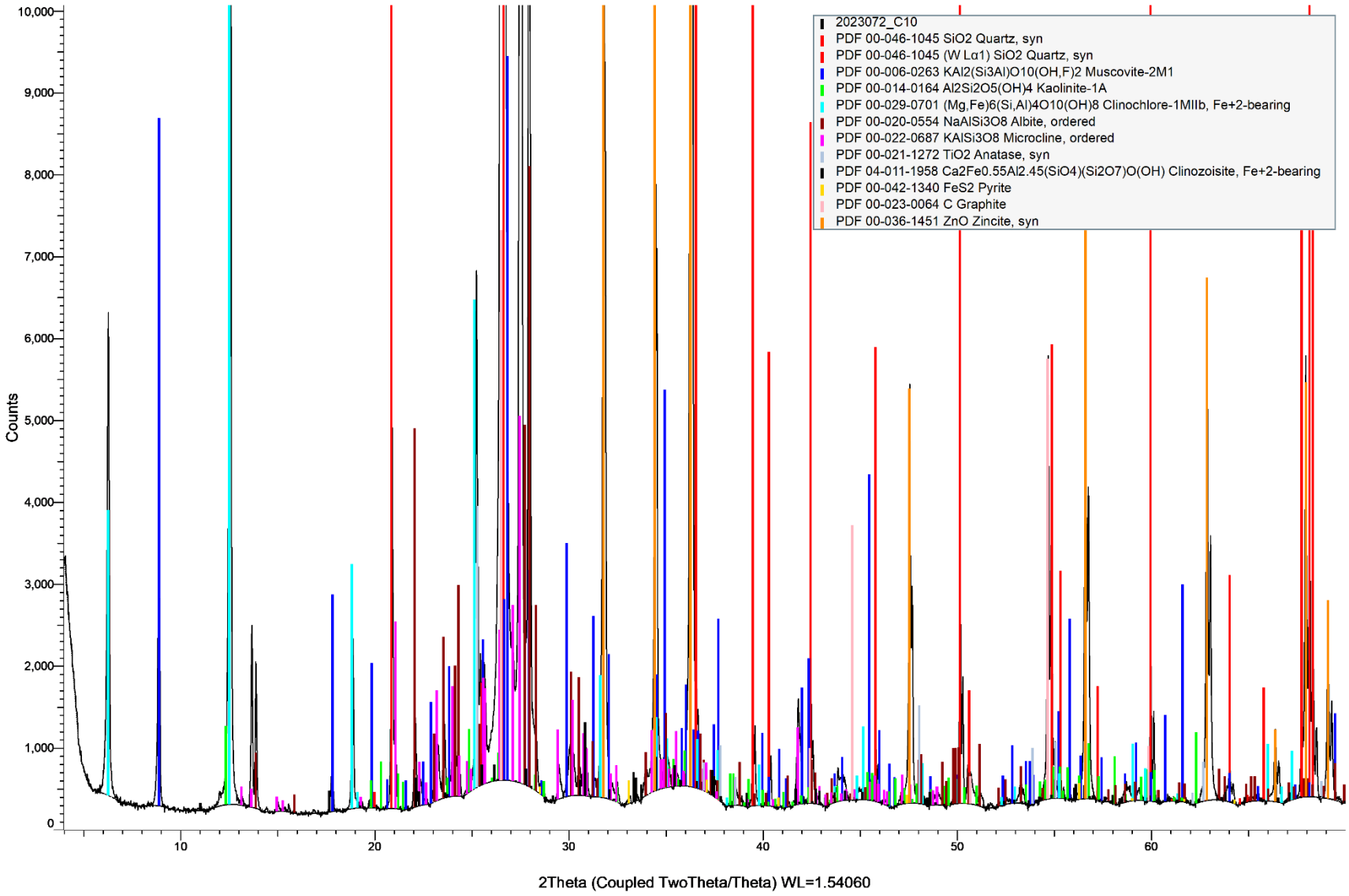
X-RAYvision AUSTRALIA

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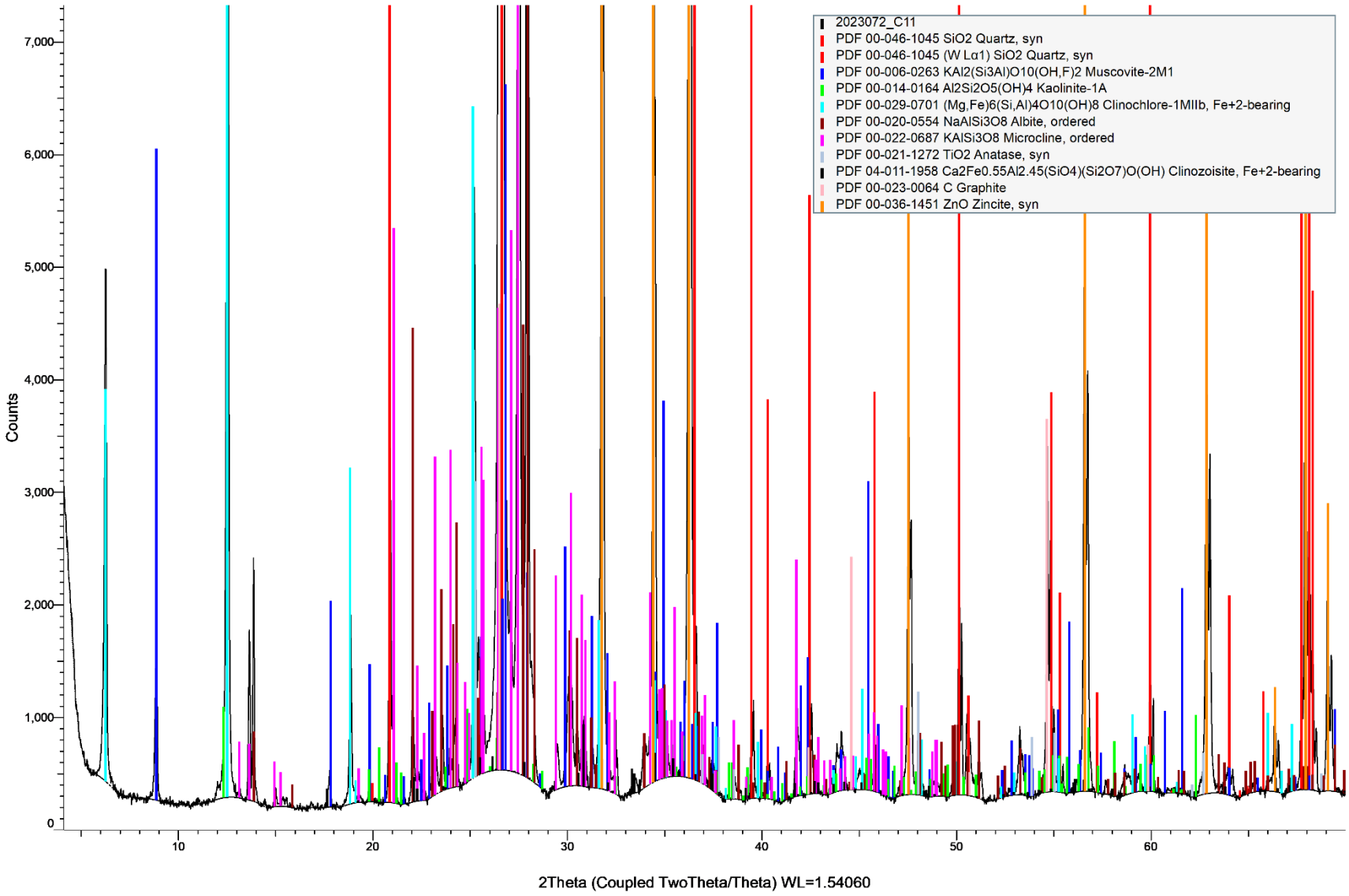
X-RAYvision AUSTRALIA

LS3269-10



X-RAYvision AUSTRALIA

LS3269-11



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RGS Environmental Consultants Pty Ltd
45 Rosedale Street
Coopers Plains QLD 4108

Attention: Melinda Hilton

November 4, 2024

Report Number: LS3258

Quantitative Analysis of Graphinex Samples

Introduction:

Five samples of Graphinex material were submitted for qualitative and quantitative phase analysis using X-ray diffraction (XRD).

Sampling & Preparation:

No sampling information was available for the samples submitted. The samples were supplied in a powder form and analysed without further crushing. The samples were mixed with 20% w/w of zinc oxide to determine the non-crystalline (amorphous) component.

Analytical Method:

The XRD patterns were produced using a Bruker-AXS D8 Endeavor XRD with copper radiation at 40 kV and 25 mA, over a range of 5 to 80 degrees 2θ, with an approximately 0.02 degree step and an effective 91 second per step count time using a Lynx-Eye XE-T detector.

Identification of phases present was carried out using Bruker EVA Search/Match software and the ICDD PDF-5+ database (2025) with SIROQUANT version 5 software used to further characterize the samples.

Results:

The XRD scans are attached including the Search/Match information.

Note that the intensity of the peaks in an XRD pattern depend upon the crystallinity as well as the concentration of the phase.

The quantitative results are summarised in the following tables:

	XVA ID:	LS3258-01	LS3258-02
	Customer ID:	2023072_C101	2023072_C102
Phase Name/Formula	**ICDD Ref**	**Weight %**	**Weight %**
Quartz; SiO_2	00-046-1045	21	27
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	2	1
Kaolinite; $Al_2Si_2O_5(OH)_4$	00-014-0164	4	3
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	9	7
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	9	10
Potassium Feldspar; KAl_3SiO_8	00-031-0966	11	9
Pyrite; FeS_2	00-042-1340	Trace	Trace
Hematite, aluminar; $(FeO_{0.86}AlO_{0.14})_2O_3$	00-002-0933	Trace	Trace
Amorphous Material	N/A	44	43

	XVA ID:	LS3258-03	LS3258-04
	Customer ID:	2023072_C103	2023072_C104
Phase Name/Formula	**ICDD Ref**	**Weight %**	**Weight %**
Quartz; SiO_2	00-046-1045	37	29
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	9	7
Kaolinite; $Al_2Si_2O_5(OH)_4$	00-014-0164	5	4
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	10	11
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	9	12
Potassium Feldspar; KAl_3SiO_8	00-031-0966	5	4
Pyrite; FeS_2	00-042-1340	1	Trace
Hematite, aluminar; $(FeO_{0.86}AlO_{0.14})_2O_3$	00-002-0933	1	1
Boehmite; AlO.OH	00-021-1307	Poss. Trace	ND
Amorphous Material	N/A	23	32

	XVA ID:	LS3258-05
	Customer ID:	2023072_C105
Phase Name/Formula	**ICDD Ref**	**Weight %**
Quartz; SiO_2	00-046-1045	33
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	00-006-0263	5
Kaolinite; $Al_2Si_2O_5(OH)_4$	00-014-0164	4
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	00-029-0701	10
Plagioclase Feldspar; $NaAlSi_3O_8$	00-019-1184	11
Potassium Feldspar; KAl_3SiO_8	00-031-0966	3
Pyrite; FeS_2	00-042-1340	Trace
Hematite, aluminar; $(FeO_{0.86}AlO_{0.14})_2O_3$	00-002-0933	Trace
Amorphous Material	N/A	34

Discussion:

The results of the analysis are summarised in the tables and scans attached. Results are given as % of the total.

While some of the fits of the more highly crystalline peaks were not ideal, the quantifications appear to be in line with the overall intensities observed.

The clay speciation analysis showed a probable split in the peak at 7 Å which is consistent with some kaolinite group clay being present. A small amount of scatter was observed at 12.5 Å which did not shift on glycolation or degrade to 10 Å on heating – this behaviour is consistent with some illite/chlorite material.

Quantification of the crystalline mineral phases was performed with the SIROQUANT™ software package. This software uses the full-profile Rietveld method of refining the profile of the calculated XRD pattern against the profile of the measured XRD pattern. The total calculated pattern is the sum of the calculated patterns of the individual phases. Results are given as weight % of the total.

Corrections are incorporated in the process that allows for a more accurate description of the mineral's contribution to the measured pattern and to allow for variation due to atomic substitution, layer disordering, preferred orientation, and other factors that affect the acquisition of the XRD scan.

The limitations of qualitative XRD analysis are as follows:

1. There is a limit of detection of 1-2% on most crystalline phases.
2. Where there exist multiple phases, overlap of diffracted reflections can occur, thus rendering some ambiguity into the interpretation.
3. Some phases cannot be unambiguously identified as they are present in minor or trace amounts.

The limitations of quantitative XRD analysis by a full-profile Rietveld method are as follows:

1. The limitations for qualitative XRD analysis all apply

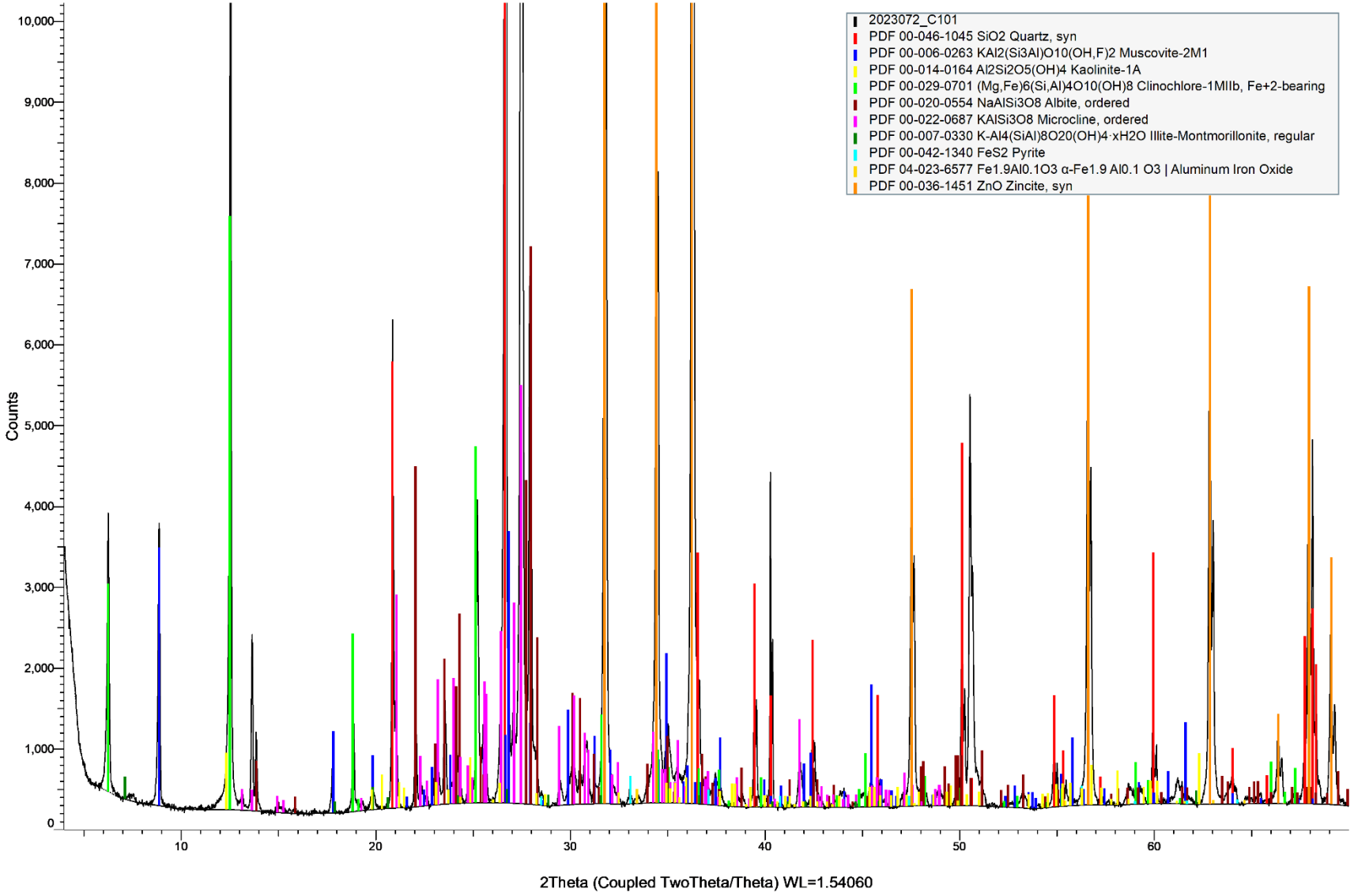
2. The method as described is standardless as it relies solely on the published crystallographic data available for each phase. Some crystallographic data may not exactly describe the phases present.
3. Results are normalized to 100% and do not include estimates of unidentified or amorphous materials unless otherwise stated.

Potential limitations on the quantitative analysis can also include effects from varying crystallinity of each mineral, their preferred orientation in the sample preparation and their differing absorption of the X-rays.

Christopher Kelaart
X-Ray Vision Australia Pty Ltd

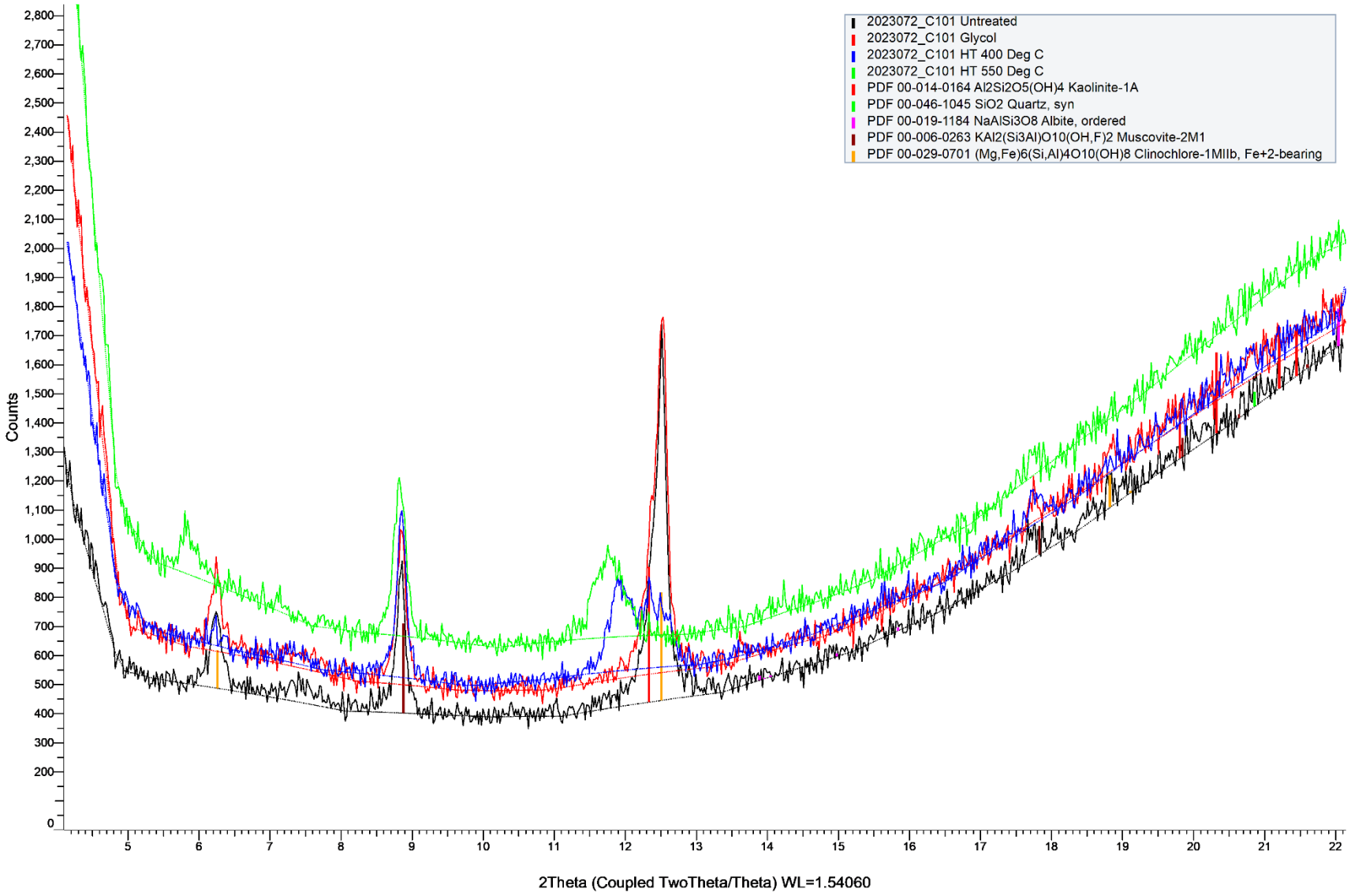
X-RAYvision AUSTRALIA

LS3258-01 Bulk Material



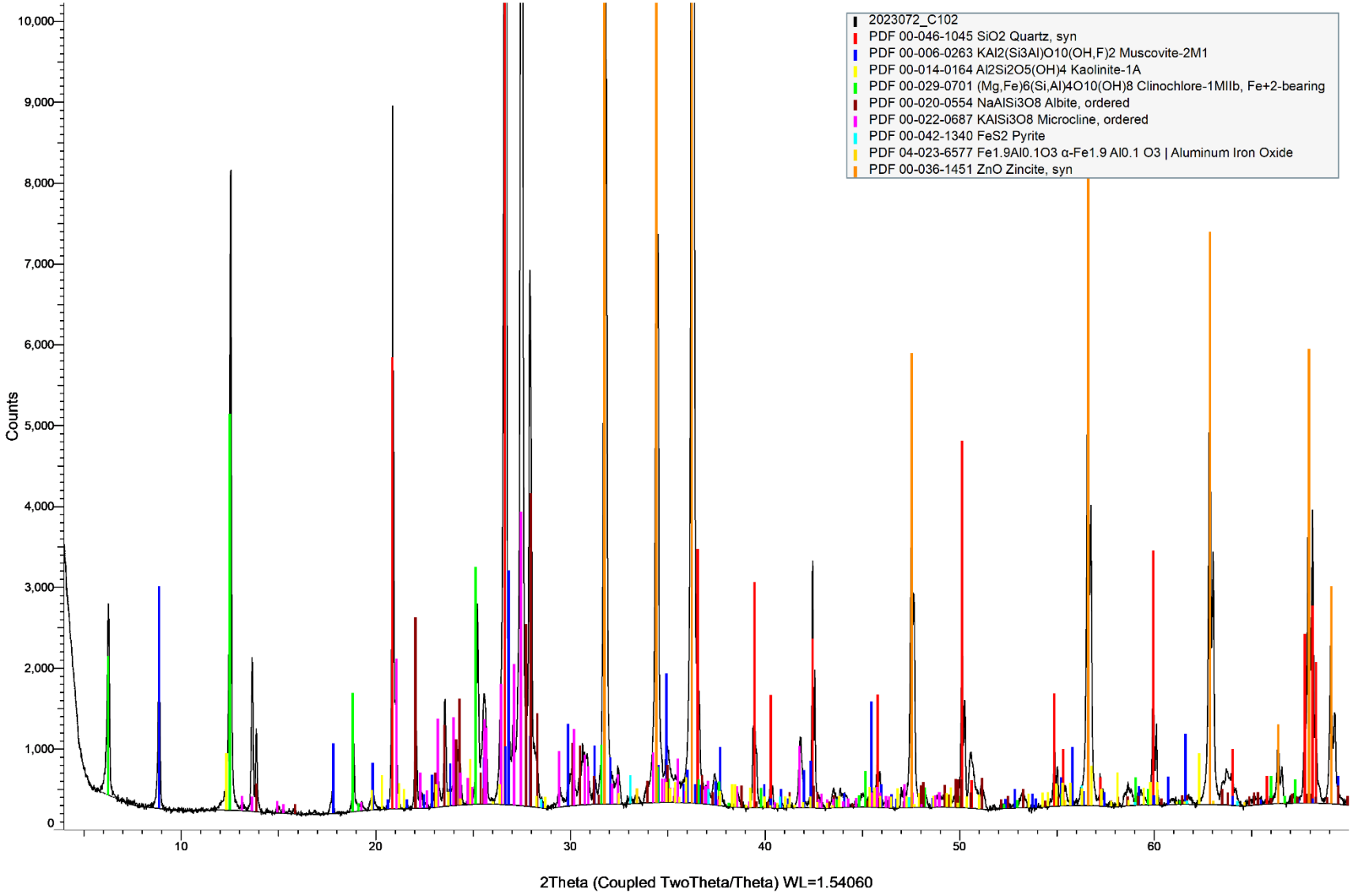
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LS3258-01 Clay Fraction



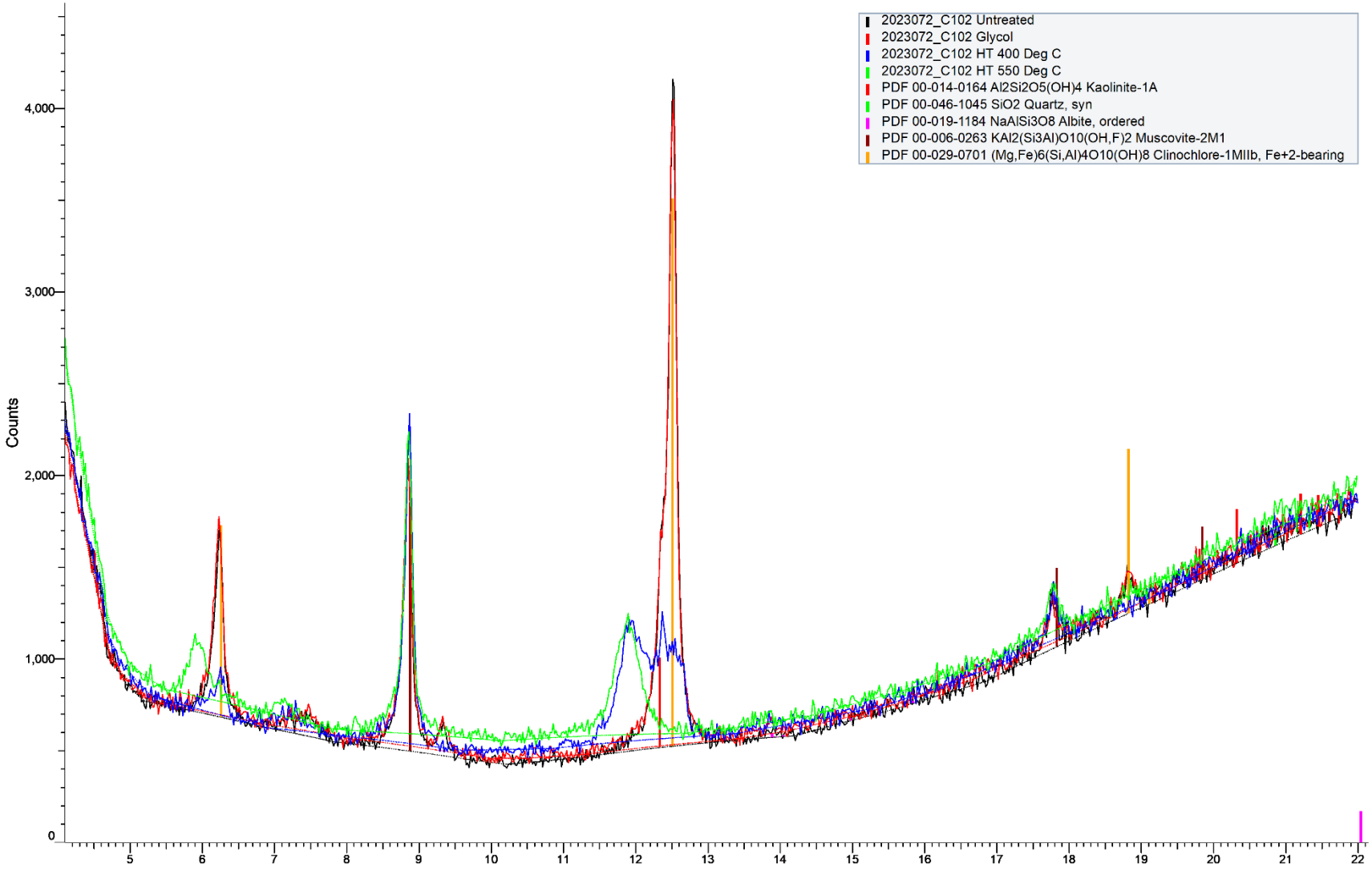
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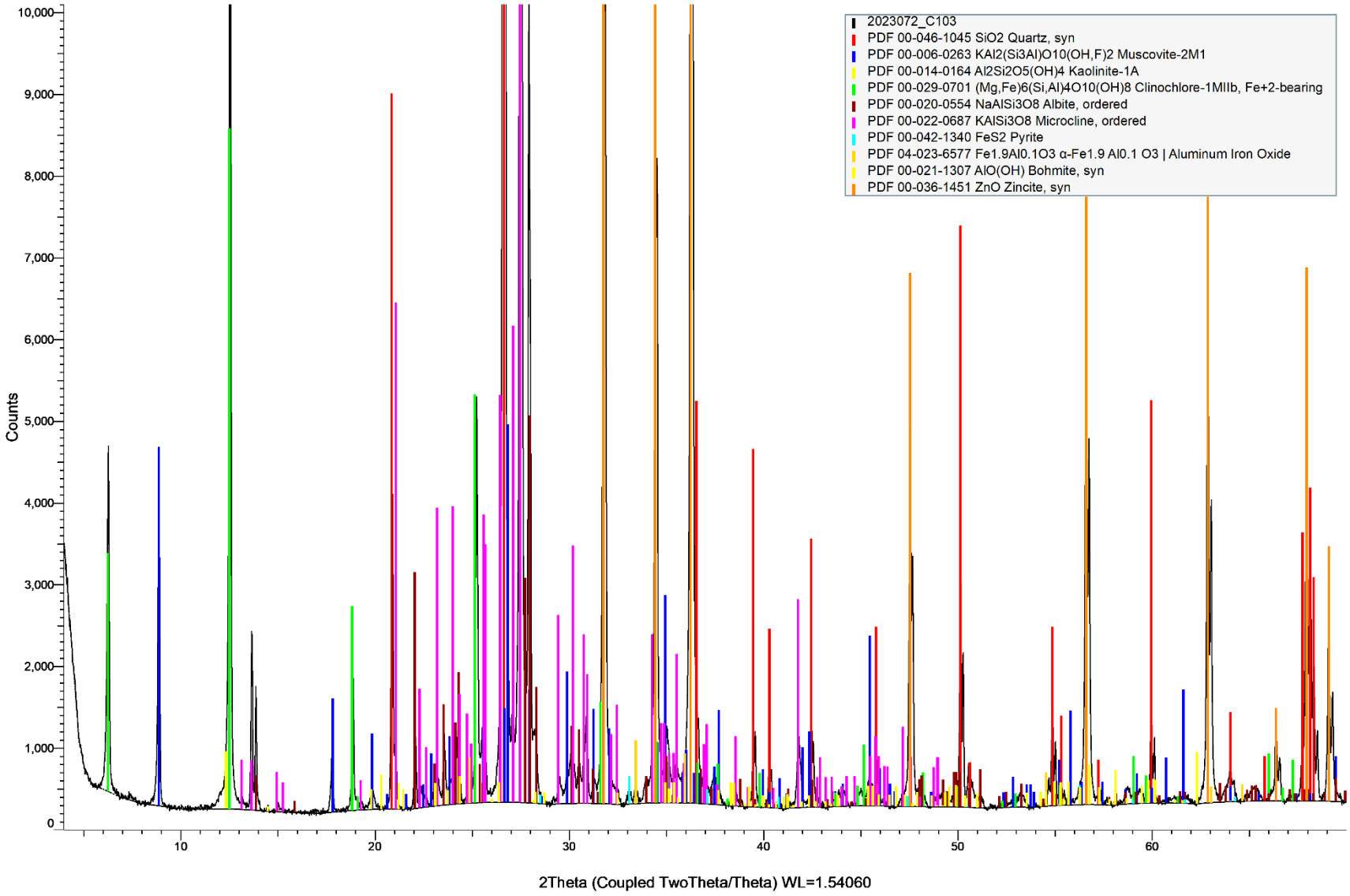
X-RAYvision
AUSTRALIA

LS3258-02 Clay Fraction



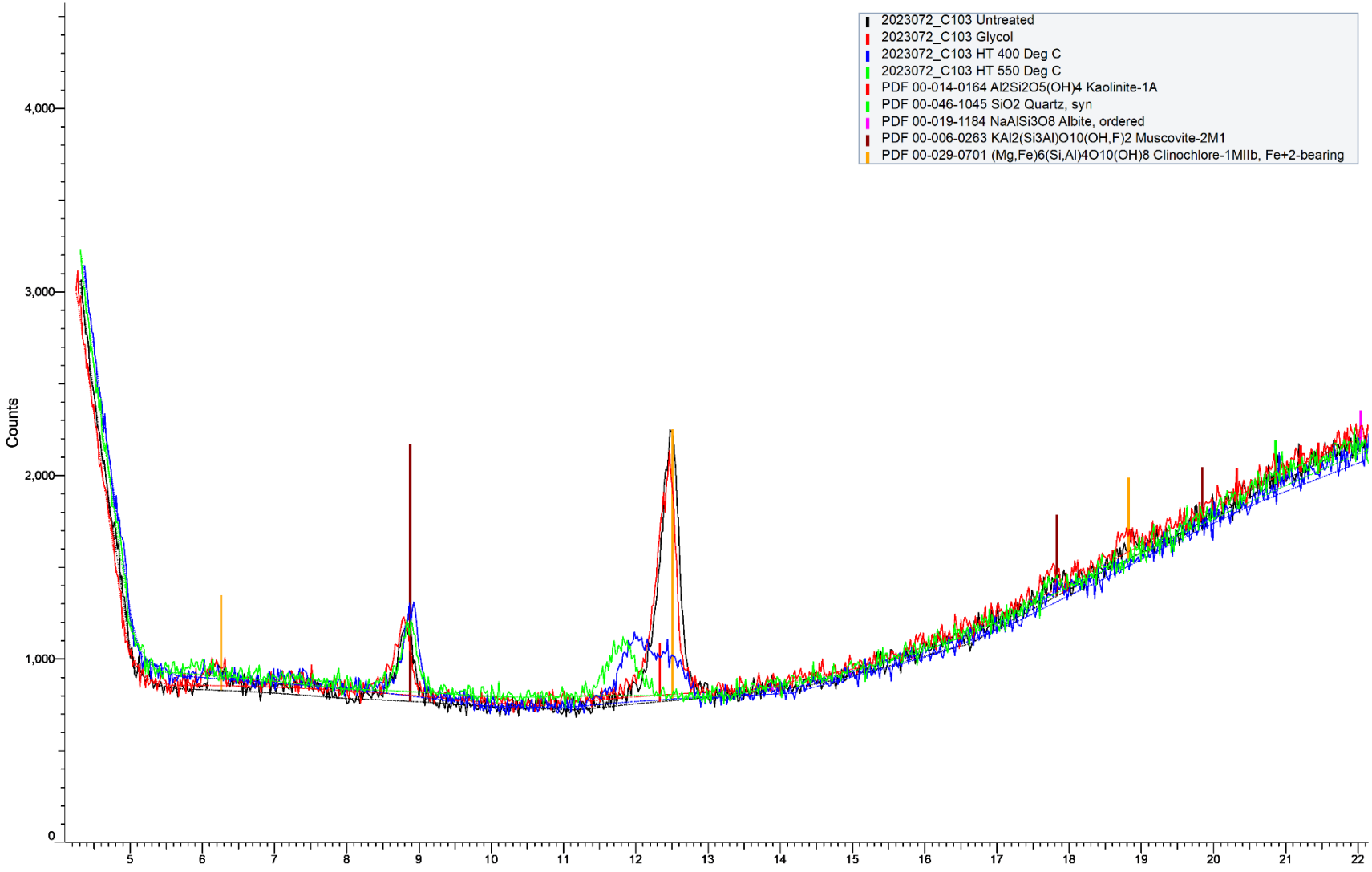
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LS3258-03 Bulk Material



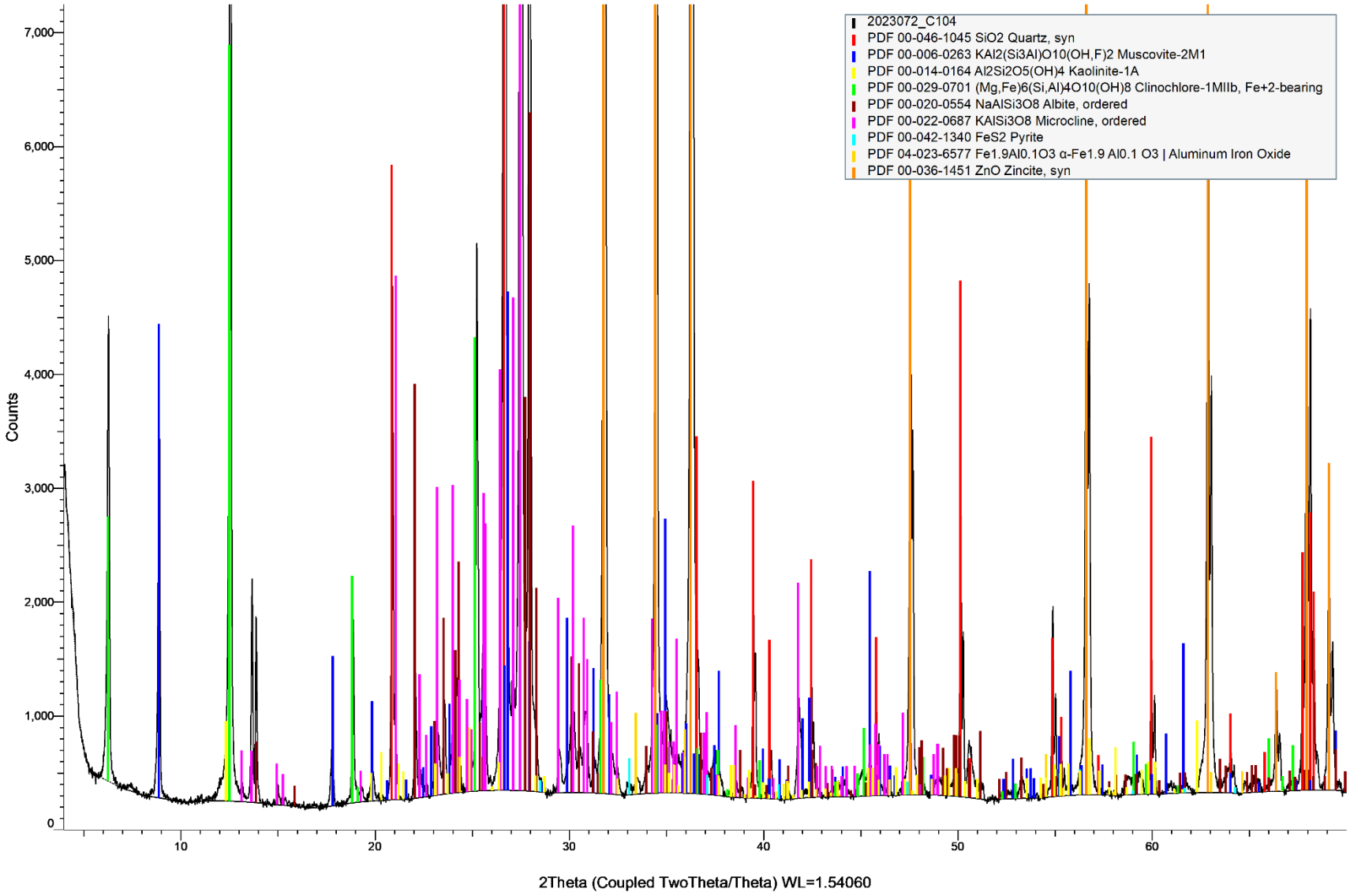
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LS3258-03 Clay Fraction



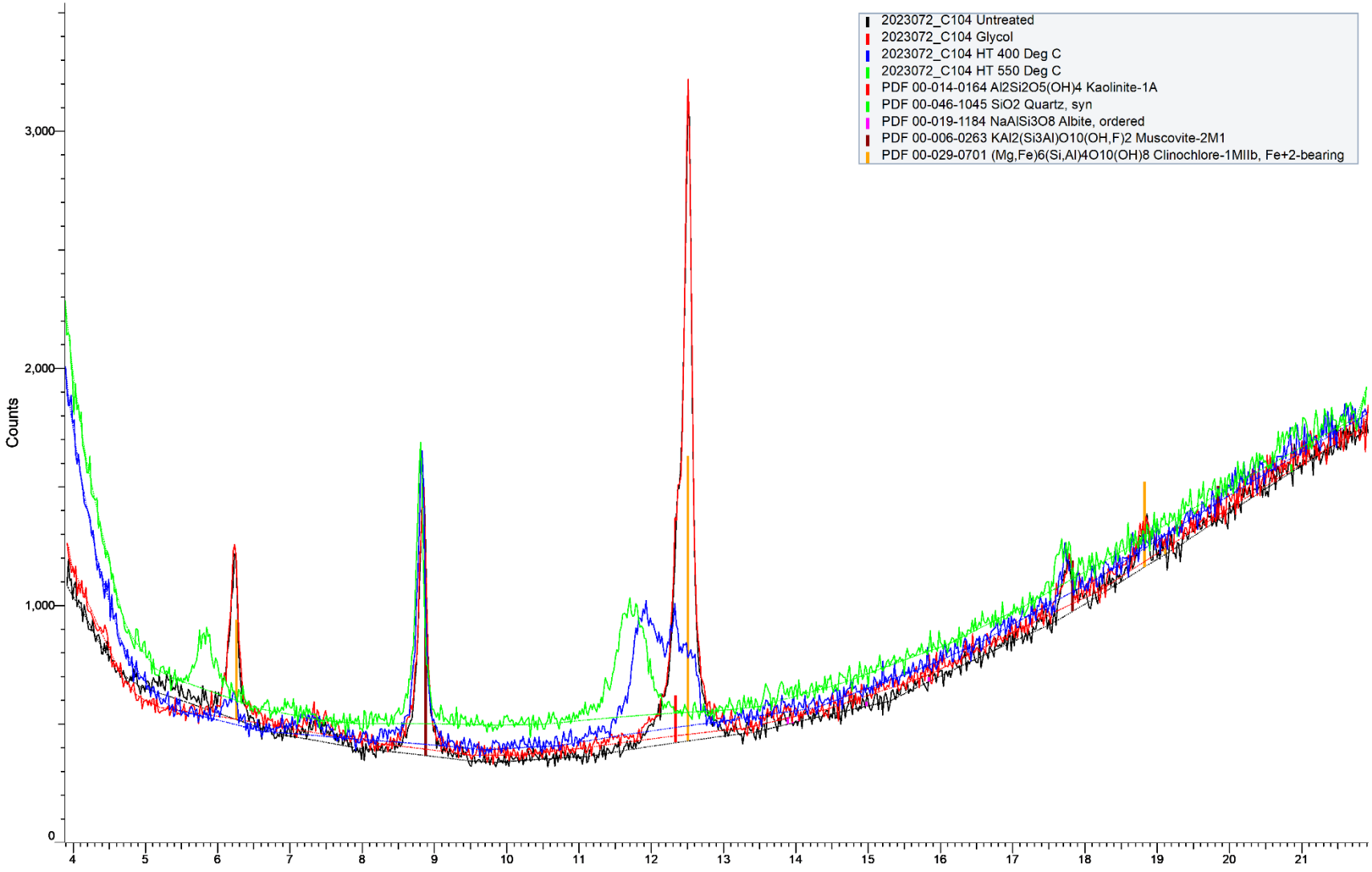
X-RAYvision AUSTRALIA

LS3258-04 Bulk Material



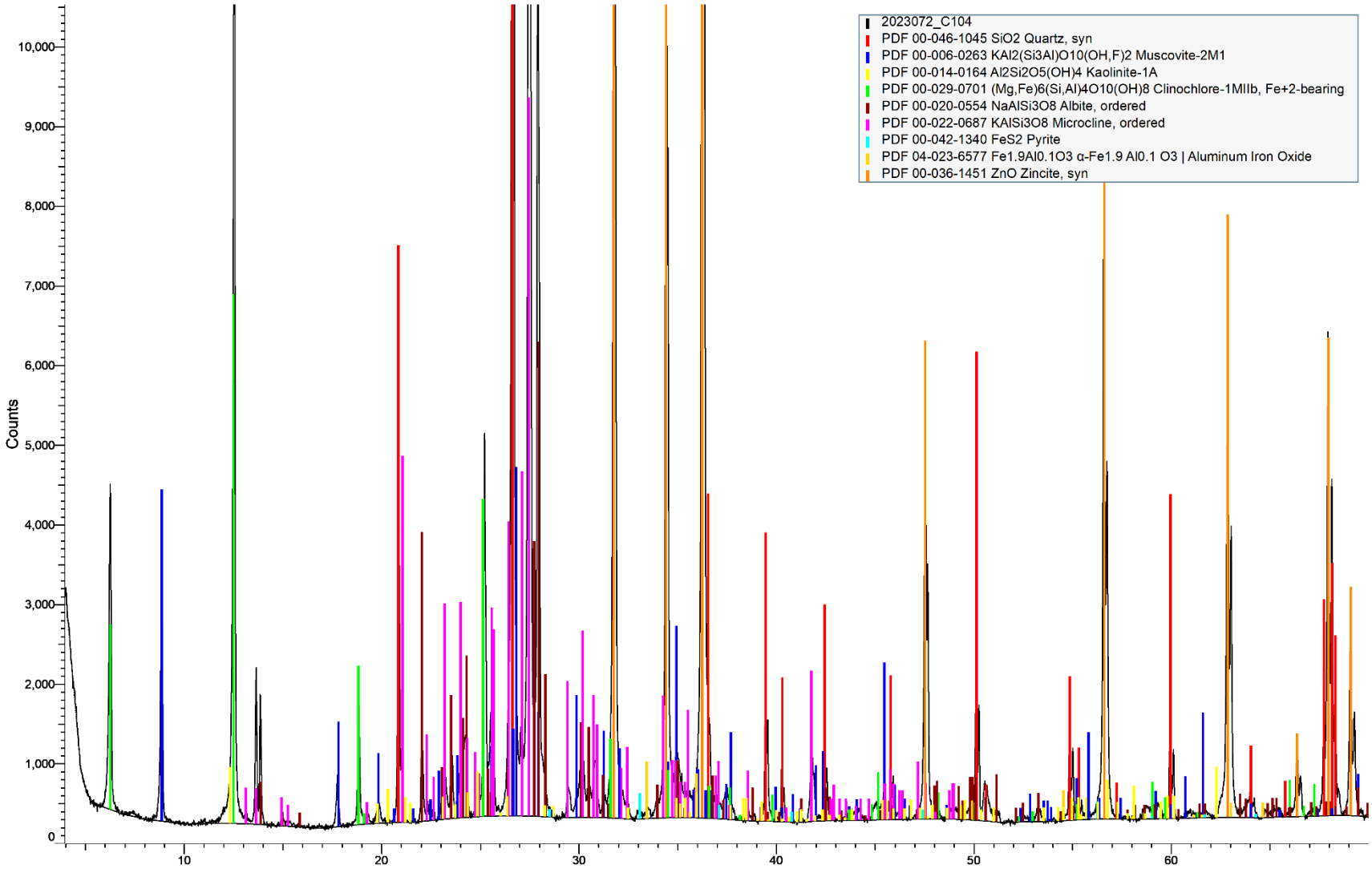
X-RAYvision AUSTRALIA

LS3258-04 Clay Fraction



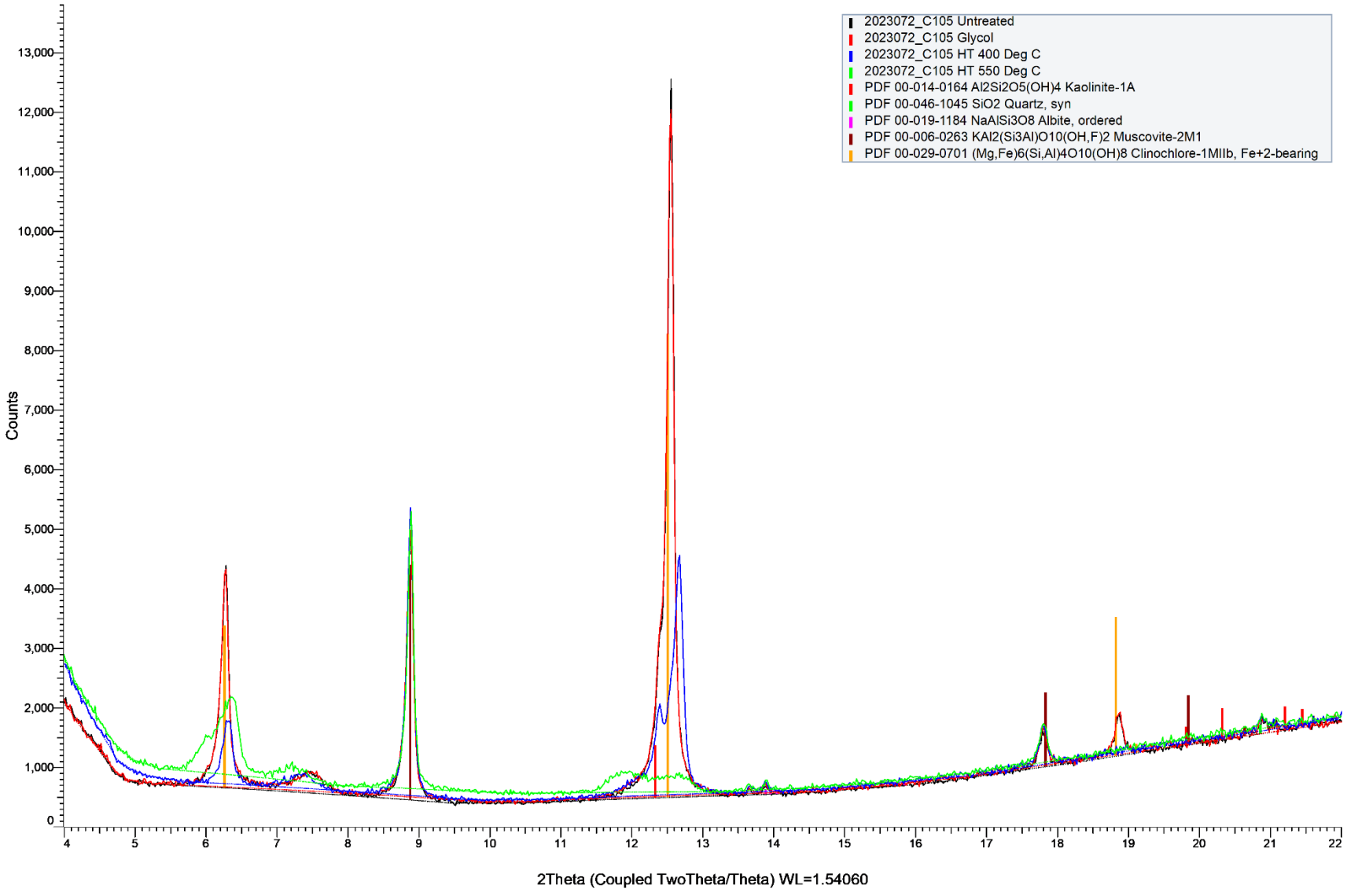
X-RAYvision AUSTRALIA

LS3258-05 Bulk Material



X-RAYvision AUSTRALIA

LS3258-05 Clay Fraction



Attachment I: Nagrom laboratory certificates

NAGROM
the mineral processor

Semi-quantitative X-ray Diffraction Report

Report Date: 2/10/2024

Sample Details:

Nagrom Reference:	T3442 Wave International
Sample ID:	T3442_Master Comp P100 3.35mm

Sample Preparation:
The sample was ground to a nominal P_{80} 45µm prior to analysis. No standards were added to the sample.

Analysis:
The sample was analysed from 5-90°2θ in a Panalytical Empyrean XRD running at 40 kV and 30 mA, producing K alpha cobalt radiation of wavelength 1.78897 Å.

The data was analysed in Bruker Diffrac.EVA Suite V5.2 using the ICDD PDF-5+ 2024 database. Results have been validated against assay data and normalised to 100%, providing no estimates of amorphous or unidentified materials.

Results:
The crystalline phases identified and their relative abundances are:

Mineral Name	Mineral Formula	Mineral Conc. (%)	ICDD Match Quality
Quartz, syn	SiO2	29	High
Microcline	K(AlSi3O8)	22	High
Albite	Na0.986Al1.005Si2.995O8	17	High
Magnesian Chamosite	(Fe1.4Mg0.9Al0.5)(Si1.4Al0.6)O5(OH)4	12	Medium
Muscovite-2M1	(K0.82Na0.18)(Al1.97Fe0.03)(AlSi3O10)(OH)2	7	Medium
Graphite | Carbon	C	6	Medium
Pyrrhotite-4M	Fe7S8	4	Medium
Fluorapatite, syn	Ca5(PO4)3F	1	Low
Calcite	Ca(CO3)	1	Low
Sepiolite	Mg16Si24O60(OH)8(OH2)8(H2O)16	Trace	Low

Results Summary:
The Graphite present in this sample exhibits extreme preferred orientation.

Notes:
The mineral names and formulas above are taken from the ICDD cards selected and represent the best matches that could be found at the time of analysis. Elemental inclusions, substitutions or solid solution series identified should be treated as indicative only.

Any amorphous material (non-crystalline) present cannot be identified by XRD techniques and will be added to the pattern background.

The uncertainty in the above results have not been quantified and may be influenced by effects such as but not limited to; preferred orientation, substitution, lattice strain, crystallinity and fluorescence.

The ICDD Match Quality is provided as a guide to confirm how closely the peak positions and intensities of the sample matched those of the given mineral provided in the ICDD database.

- High = High degree of certainty in assigned mineral or mineral group.
- Medium = Medium degree of certainty in assigned mineral or mineral group. Tertiary peaks either do not match or cannot be observed.
- Low = Low degree if certainty in assigned mineral or mineral group. Secondary peaks either do not match or cannot be observed.

Analyst:
Ian Davies, B.Sc.(Chemistry)

Approved:
Owen Carpenter, B.Sc.(Physics)

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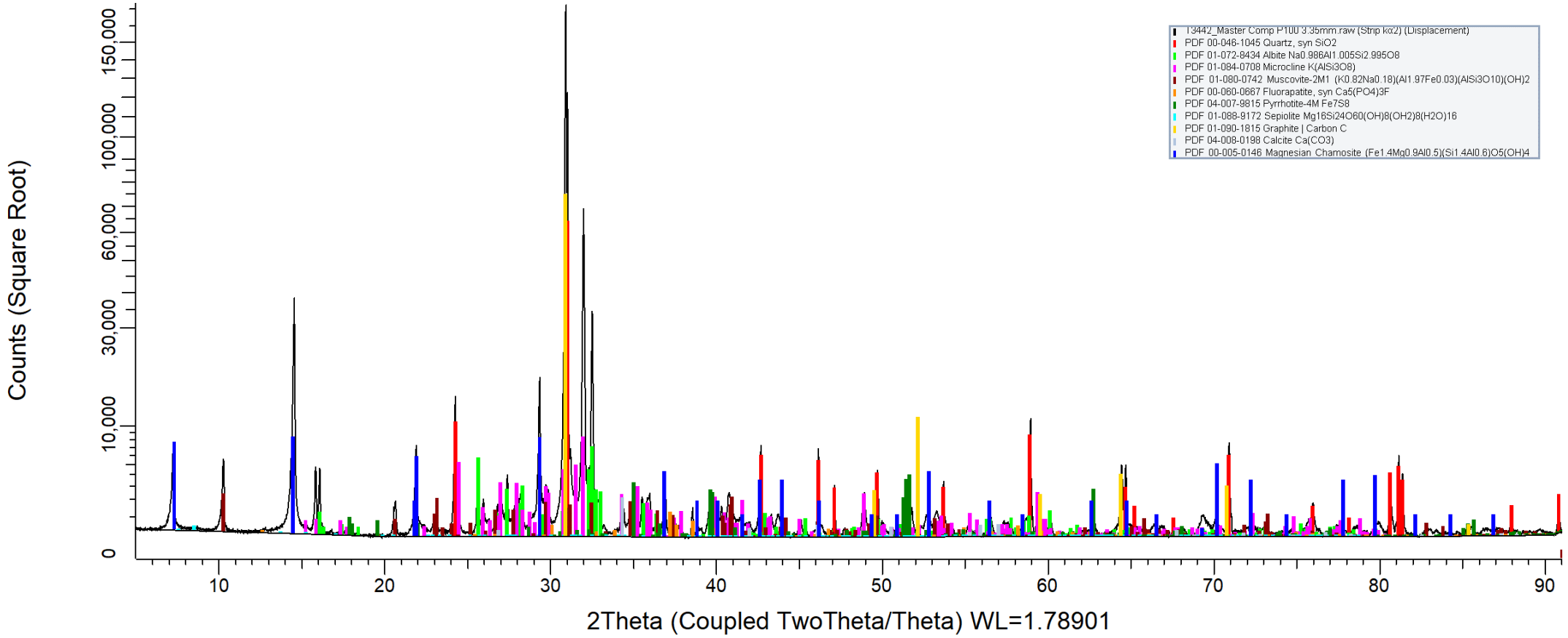
Semi-quantitative X-ray Diffraction Pattern

Sample Details:

Nagrom Reference:	T3442 Wave International
Sample ID:	T3442_Master Comp P100 3.35mm

Assay Validation:

Analyte	Si	Al	Fe	C	K	S	Na
Laboratory (%)	28.7	6.6	5.9	5.9	3.6	1.7	1.5
XRD (%)	28.7	6.5	5.8	5.9	3.6	1.7	1.5



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NAGROM
the mineral processor

ABN 55 008 868 335

Attachment J: Expert XRD report: Blue Minerals Consultancy

Blue Minerals Consultancy



15th January 2025

Interpretation of XRD data of Graphinex ore body and tailings materials

For the attention of:

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1. Context

RGS has found that the ore body materials from which Graphinex is producing graphite are resulting in pH 7–8 upon leaching even though they are geochemically classified as potentially acid forming (PAF). This may result from a component of the chromium reducible sulfur (S_{CRS}), used to calculate the maximum potential acidity (MPA), being non-acid forming (NAF) under natural weathering conditions, or alternatively there being a source of neutralisation not accessed by the acid neutralisation capacity (ANC) titration process. To provide further assessment of these two possibilities quantitative mineralogy using X-ray diffraction (XRD) was undertaken. However, diffraction analyses carried out by Nagrom and X-ray Vision on closely similar mine related materials have resulted in contrasting phase identifications and quantifications.

2. Previous XRD analyses

The samples analysed by Nagrom were composited ore body materials of alkali feldspar granite breccia and graphite xenolith. The tailings samples analysed by X-ray Vision had been ground and exposed to an organic flotation reagent but were of essentially the same origin as those analysed by Nagrom, with the exception of the removal of the majority of the graphite. The ore body materials contain approximately 1.5 wt% total sulfur with all of this being S_{CRS}.

Both sets of analyses identified quartz, feldspar (Nagrom – albite, microcline; X-ray Vision – Na plagioclase, K feldspar), muscovite and chlorite (Nagrom – Fe-chamosite) and clay (Nagrom – sepiolite; X-ray Vision – kaolinite). However, Nagrom also identified pyrrhotite (4 wt%), graphite (6 wt%, as expected on analysis of ore body material), fluorapatite (1 wt%) and calcite (1 wt%) (Table 1). In contrast X-ray Vision identified trace amounts of pyrite, hematite and possibly trace amounts of boehmite (Table 2).

X-ray Vision also identified a considerable amount of amorphous (or nano-crystalline) material. This quantification is done by addition of a known concentration of a standard material. The concentrations of the other components are then refined relative to this known component, with the remaining material, to total 100%, being classified as amorphous. For final presentation the wt% of the standard is normalised out. The addition of a standard is good analytical practice. If a standard is not added this component cannot be quantified.

Table 1 Quantitative XRD results (wt%) by Nagrom.

Mineral Name	Mineral Formula	Mineral Conc.	ICDD Match Quality
Quartz, syn	SiO_2	29	High
Feldspar			
Microcline	$K(AlSi_3O_8)$	22	High
Albite	$Na_{0.986}Al_{1.005}Si_{2.995}O_8$	17	High
Mica			
Muscovite-2M1	$(K_{0.82}Na_{0.18})(Al_{1.97}Fe_{0.03})(AlSi_3O_{10})(OH)_2$	7	Medium
Clay			
Sepiolite	$Mg_{16}Si_{24}O_{60}(OH)_8(OH_2)_8(H_2O)_{16}$	Trace	Low
Chlorite			
Magnesian Chamosite	$(Fe_{1.4}Mg_{0.9}Al_{0.5})(Si_{1.4}Al_{0.6})O_5(OH)_4$	12	Medium
Other			
Pyrrhotite-4M	Fe_7S_8	4	Medium
Graphite | Carbon	C	6	Medium
Fluorapatite, syn	$Ca_5(PO_4)_3F$	1	Low
Calcite	$Ca(CO_3)$	1	Low

Table 2 Quantitative XRD results (wt%) by X-ray Vision.

	2023072_C101	2023072_C102	2023072_C103	2023072_C104	2023072_C105
Quartz; SiO_2	21	27	37	29	33
Feldspar					
Plagioclase Feldspar; $NaAlSi_3O_8$	9	10	9	12	11
Potassium Feldspar; KAl_3SiO_8	11	9	5	4	3
Mica					
Muscovite; $KAl_2(Si_3Al)O_{10}(OH,F)_2$	2	1	9	7	5
Clay					
Kaolinite; $Al_2Si_2O_5(OH)_4$	4	3	5	4	4
Chlorite					
Chlorite; $(Mg, Fe)_6(Si, Al)_4O_{10}(OH)_8$	9	7	10	11	10
Other					
Pyrite; FeS_2	Trace	Trace	1	Trace	Trace
Hematite, aluminar; $(FeO_{0.86}AlO_{0.14})_2O_3$	Trace	Trace	1	1	Trace
Boehmite; AlO.OH			Poss. Trace	ND	
Amorphous Material	44	43	23	32	34

3. Core Materials

Due to the differences in the previous quantitative XRD findings, RGS requested Blue Minerals Consultancy to provide further analysis of the data already collected by X-ray Vision for the five tailings, and analysis of new data from eleven composited core materials (descriptions of core materials given in Table 3). These eleven core materials have, in parallel, been analysed by X-ray Vision.

Other relevant data has also been supplied, e.g., acid-base accounting, CRS S, C and bulk assays. This supplementary data enables verification of the phases identified, e.g., the presence of P for apatite.

Twenty wt% of zincite was added to all samples to enable quantification of amorphous (or nano-crystalline) components.

Table 3 Description of composited core materials. NAF – non-acid forming PAF – potentially acid forming, B – barren, LC – low capacity, Un – uncertain.

Sample name	Description	Classification
C01	Soil	NAF–B
C02	Overburden – claystone	NAF–B
C03	Overburden – sandstone	NAF–B
C04	Overburden – siltstone	NAF–B
C05	Waste rock – dolerite + metasediments	NAF–B
C06	Low grade ore	NAF–B
C07	Low grade ore	PAF
C08	Ore body	NAF–B/NAF/Un
C09	Ore body	PAF–LC/Low S
C10	Ore body	PAF/Mod S
C11	Ore body	PAF/High S

3.1 Quantitative Mineralogy of core sample composites

Data was collected twice by X-ray Vision for the core sample composites as the first set of data collected on the as received samples showed significant preferential orientation. The second set of data, after micronising, was improved. However, preferential orientation is almost impossible to eliminate for minerals with plate-like morphologies such as mica, chlorite and graphite. The degree and direction of preferential orientation must be calculated when carrying out quantitative mineralogy analysis. In the absence of the calculation of preferred orientation, random orientation of each phase is assumed and the fit of the simulated to the measured diffraction pattern will be poor.

Table 4 provides a comparison of the quantitative mineralogy derived by BMC and X-ray Vision for the eleven core samples.

3.1.1 BMC

The principal silicate minerals identified by BMC were quartz, variable mica (muscovite), chlorite (clinochlore), feldspar (albite and microcline), kaolinite and clinozoisite[1] (Table 4). In the BMC analyses the silicate minerals make up 80.1–100 wt% of the samples. A source of rapid neutralisation from this mineral system may be provided by ion exchange from mica, with slower neutralisation from Mg leaching from chlorite and potentially Ca from feldspar and clinozoisite. Carbonate acid neutralisation capacity is present as minor calcite in samples C8 and C9 (2 wt% and trace, respectively). The greater concentration of calcite in C8 coincides with the greatest measured ANC value of 33.8 kg H_2SO_4 t^{-1} (Table 5).

Variable graphite was observed by BMC, up to 9 wt%. Note – the main diffraction peak of graphite (0 0 2) is close to (essentially underlies) the main diffraction peak of quartz (1 0 1) with the graphite having extreme preferential orientation. Although the graphite diffraction peak can present as a shoulder to the quartz (1 0 1) peak it can also incorrectly appear that the quartz has preferential orientation in the (1 0 1) peak.

Pyrrhotite was the only sulfide mineral observed and only in samples C10 and C11 (4 and 5 wt%). Pyrite is usually clearly observable at low concentrations (e.g. 1 wt%) but was not identified.

Calcite was identified in minor quantities (≤2 wt%) in samples C5, C8 and C9.

Fluorapatite ($(Ca(PO_4)_3F$) was not observed. The greatest P assay was for C8 at 930 ppm. This would equate to approximately 0.5 wt% which may be visible in the XRD data, but on checking the diffraction pattern from C8 fluorapatite was not found to be present.

The amount of the amorphous (or nano-crystalline) component was as much as 16 wt% but was absent in some cases. There is no clear correlation between the amount of amorphous content and other phases present.

3.1.2 X-ray Vision

In addition to the silicates identified by BMV, X-ray Vision also identified a mixed layer illite/smectite in significant proportions in C3, C4 and C5 (27, 10 and 7 wt%, respectively). The concentrations of this phase corresponded to significantly reduced quartz concentrations as compared to the BMC analyses.

Also, in general greater albite/plagioclase and microcline/K feldspar were derived from the BMC analyses compared to the X-ray Vision analyses. The amorphous content derived by BMC was generally smaller than that from X-ray Vision, and the graphite content was significantly less.

No pyrrhotite was identified by X-ray Vision with trace pyrite being identified in C9 and C10.

[1] First identified by X-ray Vision and then added to the analysis by BMC.

Table 4 Comparison of quantitative mineralogy (wt%) derived from X-ray diffraction data by BMC and X-ray Vision (XV) on Graphinex composited core samples.

		C1	C1-XV	C2	C2-XV	C3	C3-XV	C4	C4-XV	C5	C5-XV
Quartz	SiO_2	96	77	76	56	83	66	34	25	35	31
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$	1	trace	7	3	9	5	12	4	29	19
Chlorite	$(Mg,Fe)_3(Si,Al)_4O_{10}(OH)_2(Mg,Fe)_3(OH)_6$					2	1	0	6	0	3
Albite/Plagioclase	$Na(AlSi_3O_8)–Ca(Al_2Si_2O_8)$				Poss	1	3	Trace	1	7	2
Microcline/K feldspar	$KAlSi_3O_8$			3	1	4	5	13	7	4	7
Kaolinite	$Al_2Si_2O_5(OH)_4$	1		14	8	2	8	26	19	10	13
Mixed layer Illite/smectite	$K(Al,Mg,Fe)_2(Si,Al)_4O_{10}[(OH)_{2,}(H_2O)$				27		10		7		
Calcite	$CaCO_3$									1	
Anatase	TiO_2				Trace		Poss		Trace		
Amorphous		2	23		5		2	16	31	15	24

		C6	C6-XV	C7	C7-XV	C8	C8-XV	C9	C9-XV
Quartz	SiO_2	43	30	40	33	29	20	33	26
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$	11	7	8	7	15	16	7	3
Chlorite	$(Mg,Fe)_3(Si,Al)_4O_{10}(OH)_2(Mg,Fe)_3(OH)_6$	5	7	4	9	7	24	4	19
Albite/Plagioclase	$Na(AlSi_3O_8)–Ca(Al_2Si_2O_8)$	13	8	17	9	18	10	15	10
Microcline/K feldspar	$KAlSi_3O_8$	11	5	21	6	13	4	16	6
Kaolinite	$Al_2Si_2O_5(OH)_4$	6		3		7		5	
Clinozoisite	$Ca_2Al_3(Si_2O_7)(SiO_4)O(OH)$	8	5	3	1				
Anatase	TiO_2		Poss		Poss				
Graphite	C	2		3	17	9	14	4	25
Pyrrhotite	$Fe_{1-x}S$								
Pyrite	FeS_2								1
Calcite	$CaCO_3$					2	2	Trace	
Amorphous			38	Trace	18		10	15	10

Table 4 Continued.

		C10	C10-XV	C11	C11-XV
Quartz	SiO_2	41	28	35	23
Muscovite	$KAl_2(`AlSi_3O_{10})(OH)_2$	6	3	6	2
Chlorite	$(Mg,Fe)_3(Si,Al)_4O_{10}(OH)_2(Mg,Fe)_3(OH)_6$	3	11	4	13
Albite/Plagioclase	$Na(AlSi_3O_8)–Ca(Al_2Si_2O_8)$	19	11	19	14
Microcline/K feldspar	$KAlSi_3O_8$	20	8	19	7
Kaolinite	$Al_2Si_2O_5(OH)_4$	0		3	
Clinozoisite	$Ca_2Al_3(Si_2O_7)(SiO_4)O(OH)$				Poss
Graphite	C	5	26	6	20
Pyrrhotite	$Fe_{1-x}S$	4		5	
Pyrite	FeS_2		Trace		
Amorphous		3	13	3	21

3.2 Examination of key elements and acid-base accounting of the core samples

Table 5 shows concentrations of Ca, Mg, C and S calculated from the XRD derived mineralogy by BMC and X-ray Vision for the core samples in comparison to the measured values for key elements. ANC, MPA and NAPP have also been calculated and are compared to the measured values.

3.2.1 BMC

The calculated Ca concentrations were in the general region of the measured values with all measured concentrations being <1 wt% and only 1 calculated concentration being >1 wt%. It is possible that there is some Ca present in the feldspar identified as albite. In support of this, samples C1 and C2 were found to not contain any albite by XRD and these samples also contained very low concentrations of measured Ca.

The only Mg containing phase identified by XRD was clinochlore. For the purposes of calculating the Mg concentrations given in Table 5, clinochlore containing no Fe was assumed. No clinochlore was observed using XRD in samples C1 and C2 hence the calculated Mg concentration in these cases was zero. For samples C3, C4 and C5 only ≤1 wt% clinochlore was derived from the XRD data. For C6 to C11 there is approximately, on average, 3.2 times more calculated Mg than measured Mg suggesting a stoichiometry of $(Mg_{1.8}Fe^{2+}_{3.2})Al_2Si_3O_{10}(OH)_8$, i.e., an Fe-rich chlorite.

The calculated and measured C concentrations were relatively well aligned suggesting no non-crystalline form of either graphite or carbonate mineralisation. The measured ANC (Table 5) is low for most samples except for C5 at 21.4 kg H_2SO_4 t^{-1} and C8 at 33.8 kg H_2SO_4 t^{-1}. These two samples were the only ones found by BMC to contain calcite, giving rise to calculated ANC of 11.3 and 23.5 kg H_2SO_4 t^{-1}, respectively. Given the mineralogy observed it is unlikely that 'hidden' ANC is responsible for the non-acid forming behaviour of the PAF samples. However, this can be checked by repeating the ANC measurements at a greater fizz rating.

The calculated S concentration for C1–C6 and C8 is zero as no sulfur containing phases were identified, in good agreement with the very small, measured concentrations of ≤0.12 wt%. For C7 and C9 again no S containing phases were identified but the measured concentrations of S were 1.06 and 1.16 wt%, respectively, suggesting the presence of either an amorphous phase or substitution/inclusion in another phase. Pyrrhotite was identified in both C10 and C11 in agreement with the greater measured concentration of S in these samples (1.86 and 2.52 wt%).

The net acid production potential (NAPP) values (Table 5) for C7 and C9 are 25.24 and 22.50 kg H_2SO_4 t^{-1} suggesting that they are potentially acid forming. However, no sulfide minerals were identified. This suggests that S is present in a reduced (i.e., oxidation state < +6) form that is accessible to CRS, but not as recognised sulfide phases. It is possible therefore that some proportion of this sulfur will not be acid forming on leaching. Measured NAPP for C10 and C11 was 43.0 and 71.7 kg H_2SO_4 t^{-1} respectively in reasonable agreement with the calculated vales if 42.8 and 51.6 kg H_2SO_4 t^{-1}.

NAG pH values for C2–C11 are also shown in Table 5. NAG pH was greater than 4.5 for C2–C6 in agreement with the negative NAPP values for these samples indicating these samples are NAF. For C7 and C9–C11 the NAG pH was less than 4.5, also in agreement with the positive NAPP values for these samples, suggesting that these samples are PAF. For C8 the NAG pH was less than 4.5 and the NAPP value was negative resulting in the classification of uncertain.

3.2.2 X-Ray Vision

Calculated Ca was in reasonable agreement with the measured values given the relatively high inherent uncertainty when quantifying relatively small concentrations of minerals. Identification of Ca

containing minerals (other than feldspar) correlated well with the greater measured Ca concentrations for C5, C6 and C8. Mg was generally overestimated but as discussed in Section 3.2.1 this is highly likely due to the stoichiometry assumed for chlorite suggesting the presence of Fe-rich rather than Mg-rich chlorite.

C is very significantly over estimated due to the elevated concentrations of graphite (not calcite) derived. This may be due to the fitting of the (1 0 1) quartz peak as discussed in Section 3.1.1.

S is underestimated. As stated previously X-ray Vision did not identify pyrrhotite in these samples leading to estimation of 0 wt% S in samples C10 and C11 as compared to the measured values of 1.86 wt% and 2.52 wt%.

As calcite was identified only in C8 giving rise to a calculated ANC of 19.6 kg H_2SO_4 t^{-1} as compared to the measured value of 33.8 kg H_2SO_4 t^{-1}. Pyrite was only identified in C9 (other than at trace amounts) giving a calculated MPASS of 16.4 kg H_2SO_4 t^{-1} as compared to the measured MPA (from $S_{CRS)}$ value of 33.6 kg H_2SO_4 t^{-1}.

Table 5 Comparison of measured and calculated elemental concentrations for core samples, and acid-base accounting. Where the value is zero the cell has been left blank for clarity.

	C1	**C1-XV**	**C2**	**C2-XV**	**C3**	**C3-XV**	**C4**	**C4-XV**	**C5**	**C5-XV**	**C6**	**C6-XV**
Calculated Ca from XRD (wt%)[1]									0.46	0.18	1.38	0.88
Measured Ca (wt%)	0.09		0.10		0.12		0.22		0.56		0.71	
Calculated Mg from XRD[2] (wt%)					0.44	0.26	0.05	1.57	0.06	0.79	1.31	1.84
Measured Mg (wt%)	0.06		0.19		0.23		0.39		0.54		0.44	
Calculated C from XRD (wt%)									0.14		2.14	
Measured C (wt%)	0.12		0.06		0.33		1.00		0.51		1.10	
Calculated S from XRD[3] (wt%)												
Measured S_{CRS} (wt%)	0.01		0.01		0.02		0.06		0.02		0.04	
Calculated ANC[4] (kg H_2SO_4 t^{-1})									11.3			
Calculated MPA[5] (kg H_2SO_4 t^{-1})												
Calculated NAPP (kg H_2SO_4 t^{-1})									−11.3			
Measured ANC (kg H_2SO_4 t^{-1})	0.8		5.4		5.1		14.5		21.4		16.2	
Measured MPA (kg H_2SO_4 t^{-1})	0.2		0.3		0.6		1.7		0.3		1.0	
Measured NAPP (kg H_2SO_4 t^{-1})	−0.6		−5.1		−4.5		−12.8		−21.1		−15.2	
NAG pH			6.5		7.1		6.3		8.1		7.2	

Table 5 Continued.

	C7	C7-XV	C8	C8-XV	C9	C9-XV	C10	C10-XV	C11	C11-XV
Calculated Ca from XRD (wt%)[1]	0.58	0.18	0.96	0.80						
Measured Ca (wt%)	0.25		0.97		0.43		0.35		0.33	
Calculated Mg from XRD[2] (wt%)	1.15	2.36	1.84	6.30	1.11	4.99	0.66	2.89	0.96	3.41
Measured Mg (wt%)	0.28		0.64		0.32		0.23		0.28	
Calculated C from XRD (wt%)	2.93	17.00	9.24	14.24	4.15	25.00	5.03	26.00	6.48	20.00
Measured C (wt%)	2.59		7.84		5.15		6.63		8.16	
Calculated S from XRD[3] (wt%)						0.53	1.40		1.69	
Measured S_{CRS} (wt%)	1.06		0.12		1.16		1.86		2.52	
Calculated ANC[4] (kg H_2SO_4 t^{-1})			23.5	19.6						
Calculated MPA[5] (kg H_2SO_4 t^{-1})						16.4	42.8		51.6	
Calculated NAPP (kg H_2SO_4 t^{-1})			-23.5	-19.6		16.4	42.8		51.6	
Measured ANC (kg H_2SO_4 t^{-1})	6.0		33.8		11.1		9.4		5.4	
Measured MPA (kg H_2SO_4 t^{-1})	31.2		3.1		33.6		52.4		77.1	
Measured NAPP (kg H_2SO_4 t^{-1})	25.2		−30.7		22.5		43.0		71.7	
NAG pH	2.8		3.9		2.9		2.6		2.6	

1 Assumes albite rather than plagioclase

2 Assumes chlorite has no Fe, $Mg_5Al_2Si_3O_{10}(OH)_8$

3 Assumes stoichiometry of pyrrhotite is FeS

4 Carbonate only from XRD

5 Total S, XRD

3.2 Tails samples

Each tailings composite is a mixture of rougher tails 1 (≈1.3 kg), cleaner 1 tails (≈0.2 kg), and cleaner 2 tails (≈0.02 kg). The rougher float feed is ground to −300 µm with subsequent grinding before the cleaner 1 float and before the cleaner 2 float (3 grinding stages). The coarsest to finest float tails are C101 > C102 > C105 > C104 > C103 with bulk density following the same pattern. Hydrocarbon data suggests that highest to lowest EKOFOL collector concentrations are C105 > C102 > C103 > C101 > C104. The parent ore body materials in the tailings are likely to be the same for all 5 samples.

Preferential orientation of some phases was apparent in the XRD data. As the rougher tails make up most of these samples and they are relatively coarse, it is recommended that future samples be micronised before XRD data collection.

In contrast to the composited ore body core samples (C8 to C11) the component of amorphous (or nanocrystalline) material in the tailings samples is much greater at 31.5–51.5 wt% (Table 6). This range of concentrations is in reasonable agreement to that found by X-ray Vision for the same tailings XRD data (Table 2).

The quartz, muscovite and chlorite (clinochlore) concentrations are significantly smaller than for the core samples, whereas the feldspar (albite, microcline) and kaolinite concentrations are slightly smaller than the core sample concentrations (approx. 50 to 75%). No calcite or pyrrhotite was observed. Graphite is much reduced as expected in the tailings. No pyrrhotite, or other sulfide containing mineral, was identified.

As no Ca-containing minerals were observed the calculated Ca concentration was zero. The measured Ca concentration was constant across the 5 samples at 0.36–0.38 wt%. This may suggest some Ca inclusion in albite.

The calculated Mg concentration, assuming a clinochlore stoichiometry of $Mg_5Al_2Si_3O_{10}(OH)_8$, was much greater than the measured Mg concentration, as for the composited core samples, again indicating a significant Fe component in the clinochlore.

The calculated C concentration was based solely on the graphite concentration and was less than the measured values (0.00–0.14 wt% *cf* 0.88–2.11 wt%) with an average difference of 1.3 wt%. A component of this may be due to the addition of collector.

The calculated S concentration was zero as no S-containing minerals were identified. This contrasts with the measured S_{CRS} values of 1.42–1.50 wt%. This is a similar result to the core samples where much of the S_{CRS} present was found not to be associated with sulfide mineralogy as derived from quantitative XRD.

As expected from this mineralogy the ANC was very small (≤6.9 kg H_2SO_4 t^{-1}, Table 6). This, in combination with S_{CRS} values resulted in positive NAPP values. This along with the NAG pH (Table 6) of less than 4.5 in all cases resulted in PAF classification. However, the S speciation remains unclear.

Table 6 Quantitative mineralogy (wt%) derived from X-ray diffraction data on Graphinex tails samples, and comparison of measured and calculated elemental concentrations, and acid-base accounting.

		C101	C102	C103	C104	C105
Quartz	SiO_2	21.5	30.4	20.9	19.6	16.4
Muscovite	$KAl_2(AlSi_3O_{10})(OH)_2$	4.3	4.5	2.7	5.2	2.2
Clinochlore	$(Mg;Fe^{2+})_5Al_2Si_3O_{10}(OH)_8$	2.5	3.3	2.2	2.9	2.7
Albite	$NaAlSi_3O_8$	11.7	14.1	10.4	10.8	11.3
Microcline	$KAlSi_3O_8$	12.9	16.1	13.1	14.4	13.0
Kaolinite	$Al_2Si_2O_5(OH)_4$	1.9		3.0	2.3	2.9
Graphite	C	0.1	Trace	0.1		0.1
Amorphous		45.1	31.5	47.6	44.7	51.5
Measured Ca (wt%)		0.36	0.38	0.37	0.37	0.38
Calculated Mg from XRD[1] (wt%)		0.66	0.87	0.58	0.76	0.71
Measured Mg (wt%)		0.23	0.25	0.25	0.25	0.26
Calculated C from XRD (wt%)		0.14	0.04	0.05	0.00	0.05
Measured C (wt%)		0.95	1.50	1.50	0.88	2.11
Measured S_{CRS} (wt%)		1.42	1.49	1.50	1.46	1.48
ANC (kg H_2SO_4 t^{-1})		6.7	6.9	6.4	5.7	5.4
MPA (kg H_2SO_4 t^{-1})		43.5	45.6	45.9	44.7	45.3
NAPP (kg H_2SO_4 t^{-1})		36.8	38.7	39.5	39.0	39.9
NAG pH		2.7	2.7	2.7	2.7	2.6

1 Assumes clinochlore has no Fe; $Mg_5Al_2Si_3O_{10}(OH)_8$

4. Discussion and suggested further measurements

For both composited core, and tails samples:

- Micronising of the samples prior to XRD analysis is recommended to decrease preferential orientation and improve confidence in data analysis.
- There is no clear source of ANC other than calcite based on the derived mineralogy. Some rapid ANC may be due to ion exchange from mica, with slower ANC derived from Mg leaching from chlorite and possible Ca leaching from 'albite' or clinozoisite Given the relatively low abundance of these minerals, it is likely that these contributions would not be significant.
- There is uncertainty around the S speciation in these samples with the only sulfide containing mineral found by BMC in two core samples, being pyrrhotite leaving significant S_{CRS} unaccounted for.

It is now well established that pyrrhotite, in natural environments, mostly oxidises to form elemental S which is a non-acid forming reaction:

$$\mathrm{Fe}_{(1-x)}\mathrm{S} + \frac{3(1-x)}{4}\mathrm{O}_2 + \frac{(1-x)}{2}\mathrm{H}_2\mathrm{O} \rightarrow (1-x)\mathrm{FeOOH} + \mathrm{S}^0$$

However, in NAG tests when exposed to highly oxidising peroxide solution, acid is generated via:

$$\mathrm{Fe}_{(1-x)}\mathrm{S} + \frac{(9-3x)}{2}\mathrm{H}_2\mathrm{O}_2 \rightarrow (1-x)\mathrm{FeOOH} + \mathrm{SO}_4^{2-} + 2\mathrm{H}^+ + \frac{6-2x}{2}\mathrm{H}_2\mathrm{O}$$

Thus, using standard acid-base accounting testing, pyrrhotite will contribute to both S_{CRS} and therefore MPA, and decreased NAG pH, often resulting in incorrect PAF classification.

Given that pyrrhotite is present in these samples it is also possible that they have undergone natural weathering resulting in the formation of elemental sulfur and/or that this is present within the graphite[2]. Weathering of elemental S to sulfate, while acid forming, is known to be extremely slow[3] and does not constitute an acid drainage risk. However, when exposed to peroxide it is likely that the following reaction occurs with the formation rate of acid greatly increased:

$$S^0 + 3H_2O_2 \rightarrow 2H^+ + 2H_2O$$

Also, elemental S will contribute to S_{CRS}[e.g.4], as the CRS method is sensitive to all reduced inorganic S (oxidations state less than +6) species, not just oxidation state -2 as is largely present in pyrrhotite or -1 as is present in pyrite. Thus, elemental S may behave in an analogous manner to pyrrhotite, i.e., increasing MPA while also resulting in decreased NAG pH.

To explore these possibilities further the tests below are suggested:

- To further examine the possibility of source of ANC it is suggested that the ANC measurements be done at a greater fizz rating and that the ANC leach liquors be assayed after titration to pH 7.
- X-ray photoelectron spectroscopy can be carried out to quantify the S species and oxidation states present. This is straightforward and cost effective.
- Solvent extraction (generally acetone) is undertaken to quantify the amount of elemental S and polysulfide present. Further speciation testing may also be possible.

[2] Adjizian, J.-J., Latham, C.D., Öberg, S., Briddon, P.R., Heggie, M.I., DFT study of the chemistry of sulfur in graphite, including interactions with defects, edges and folds, Carbon, 62, 256-262 (2013)
[3] Smith, L. A. Rates of elemental sulphur oxidation and associated oxygen and sulfur isotope fractionation, University of Saskatchewan, (2009)
[4] Canfield, D., Raiswell, R., Westrich, J., Reaves, C., Berner, R., The use of chromium reduction in the analysis of reduced inorganic sulfur in sediments and shales, Chemical Geology, 54, 149-155 (1986)

Attachment K: Groundwater test results

Table 7-1: Water quality results for groundwater monitoring bores at the Esmeralda project

Order	COD			Sample Name	CE177051.001	CE177051.002	CE177051.003	CE177051.004
Project	4169 - Esmeralda			Description	ESMB1D	ESMB2D	ROWE3	24ESD002
				Sample Date	14/8/2024	14/8/2024	15/8/2024	15/8/2024
				Matrix	Water	Water	Water	Water
Job Number	Method Name	Analyte Name	Units	Reporting Limit	Result	Result	Result	Result
CE177051	pH in water	pH	pH Units	0.1	**8.6**	**8.5**	**8.6**	**9.0**
CE177051	Conductivity and TDS by Calculation - Water	Conductivity @ 25 C	µS/cm	2	**890**	**1100**	**1300**	**910**
CE177051	Conductivity and TDS by Calculation - Water	Total Dissolved Solids (by calculation)	mg/L	2	**530**	**660**	**770**	**540**
CE177051	Alkalinity	Total Alkalinity as CaCO3	mg/L	5	**390**	**430**	**450**	**390**
CE177051	Alkalinity	Bicarbonate Alkalinity as CaCO3	mg/L	5	**340**	**390**	**410**	**300**
CE177051	Alkalinity	Carbonate Alkalinity as CaCO3	mg/L	5	**42**	**35**	**46**	**87**
CE177051	Alkalinity	Hydroxide Alkalinity as CaCO3	mg/L	5	<5	<5	<5	<5
CE177051	Fluoride by Ion Selective Electrode in Water	Fluoride by ISE	mg/L	0.1	**2.0**	**2.3**	**2.3**	**2.0**
CE177051	Chloride by Discrete Analyser in Water	Chloride, Cl	mg/L	1	**51**	**97**	**140**	**50**
CE177051	Anions by Ion Chromatography in Water	Bromide	mg/L	0.05	**0.07**	**0.21**	**0.34**	**0.05**
CE177051	Reactive Silica by Discrete Analyser	Reactive Silica, SiO_2	mg/L	0.1	**16**	**17**	**17**	**1.9**
CE177051	Metals in Water (Dissolved) by ICPOES	Calcium, Ca	mg/L	0.2	**1.7**	**2.6**	**1.5**	**2.3**
CE177051	Metals in Water (Dissolved) by ICPOES	Magnesium, Mg	mg/L	0.1	**0.5**	**0.9**	**0.5**	**0.5**
CE177051	Metals in Water (Dissolved) by ICPOES	Potassium, K	mg/L	0.1	**6.1**	**7.0**	**4.9**	**3.5**
CE177051	Metals in Water (Dissolved) by ICPOES	Sodium, Na	mg/L	0.5	**220**	**280**	**320**	**210**
CE177051	Metals in Water (Dissolved) by ICPOES	Sodium Adsorption Ratio	No unit	0.2	**38**	**39**	**57**	**32**
CE177051	Metals in Water (Dissolved) by ICPOES	Sulfur asSulfate, SO4	mg/L	0.5	**2.2**	**2.4**	**0.7**	**0.9**
CE177051	Metals in Water (Dissolved) by ICPOES	Aluminium, Al	mg/L	0.005	**1.0**	**0.82**	**0.008**	**0.060**
CE177051	Metals in Water (Dissolved) by ICPOES	Boron, B	mg/L	0.005	**0.16**	**0.19**	**0.19**	**0.16**
CE177051	Metals in Water (Dissolved) by ICPOES	Barium, Ba	mg/L	0.005	**0.020**	**0.063**	**0.022**	**0.72**
CE177051	Metals in Water (Dissolved) by ICPOES	Iron, Fe	mg/L	0.005	**0.82**	**1.1**	**0.014**	**0.95**
CE177051	Metals in Water (Dissolved) by ICPOES	Manganese, Mn	mg/L	0.005	**0.018**	**0.032**	<0.005	**0.097**
CE177051	Metals in Water (Dissolved) by ICPOES	Strontium, Sr	mg/L	0.005	**0.027**	**0.039**	**0.025**	**0.065**
CE177051	Metals in Water (Dissolved) by ICPOES	Zinc, Zn	mg/L	0.005	**0.008**	**0.028**	<0.005	<0.005
CE177051	Metals in Water (Dissolved) by ICPOES	Total Hardness by Calculation	mg CaCO3/L	1	**6**	**10**	**6**	**8**
CE177051	Metals in Water (Total) by ICPOES	Total Potassium	mg/L	0.1	**8.7**	**10**	**6.2**	**4.7**
CE177051	Metals in Water (Total) by ICPOES	Total Magnesium	mg/L	0.1	**2.3**	**3.6**	**0.6**	**0.7**
CE177051	Metals in Water (Total) by ICPOES	Total Calcium	mg/L	0.2	**2.8**	**4.3**	**1.7**	**2.9**
CE177051	Metals in Water (Total) by ICPOES	Total Sodium	mg/L	0.5	**260**	**330**	**380**	**260**
CE177051	Metals in Water (Total) by ICPOES	Total Aluminium	mg/L	0.005	**13**	**17**	**0.012**	**0.14**
CE177051	Metals in Water (Total) by ICPOES	Total Boron	mg/L	0.005	**0.18**	**0.22**	**0.20**	**0.17**
CE177051	Metals in Water (Total) by ICPOES	Total Barium	mg/L	0.005	**0.082**	**0.30**	**0.024**	**1.0**
CE177051	Metals in Water (Total) by ICPOES	Total Iron	mg/L	0.005	**10**	**16**	**0.055**	**4.9**
CE177051	Metals in Water (Total) by ICPOES	Total Manganese	mg/L	0.005	**0.16**	**0.25**	<0.005	**0.28**
CE177051	Metals in Water (Total) by ICPOES	Total Strontium	mg/L	0.005	**0.049**	**0.074**	**0.029**	**0.084**
CE177051	Metals in Water (Total) by ICPOES	Total Zinc	mg/L	0.005	**0.063**	**0.24**	<0.005	**0.010**
CE177051	Metals in Water (Total) by ICPOES	Total Hardness	mg CaCO3/L	1	**16**	**26**	**7**	**10**
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Arsenic	mg/L	0.001	**0.002**	**0.008**	**0.010**	**0.001**
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Chromium	mg/L	0.001	**0.002**	<0.001	<0.001	<0.001
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Cobalt	mg/L	0.001	<0.001	**0.001**	<0.001	<0.001

CE177051	Trace Metals (Dissolved) in Water by ICPMS	Copper	mg/L	0.001	**0.002**	**0.005**	<0.001	<0.001
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Lead	mg/L	0.001	**0.003**	**0.003**	<0.001	<0.001
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Molybdenum	mg/L	0.001	**0.004**	**0.004**	**0.005**	**0.041**
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Nickel	mg/L	0.001	**0.001**	**0.002**	<0.001	<0.001
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001
CE177051	Trace Metals (Dissolved) in Water by ICPMS	Vanadium	mg/L	0.001	**0.005**	**0.006**	**0.003**	<0.001
CE177051	Trace Metals (Total) in Water by ICPMS	Total Arsenic	mg/L	0.001	**0.002**	**0.009**	**0.011**	**0.002**
CE177051	Trace Metals (Total) in Water by ICPMS	Total Beryllium	mg/L	0.001	<0.001	**0.002**	<0.001	<0.001
CE177051	Trace Metals (Total) in Water by ICPMS	Total Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CE177051	Trace Metals (Total) in Water by ICPMS	Total Chromium	mg/L	0.001	**0.012**	**0.012**	<0.001	**0.001**
CE177051	Trace Metals (Total) in Water by ICPMS	Total Cobalt	mg/L	0.001	**0.004**	**0.008**	<0.001	<0.001
CE177051	Trace Metals (Total) in Water by ICPMS	Total Copper	mg/L	0.001	**0.008**	**0.021**	<0.001	<0.001
CE177051	Trace Metals (Total) in Water by ICPMS	Total Lead	mg/L	0.001	**0.017**	**0.029**	<0.001	<0.001
CE177051	Trace Metals (Total) in Water by ICPMS	Total Molybdenum	mg/L	0.001	**0.005**	**0.004**	**0.005**	**0.042**
CE177051	Trace Metals (Total) in Water by ICPMS	Total Nickel	mg/L	0.001	**0.009**	**0.012**	<0.001	**0.002**
CE177051	Trace Metals (Total) in Water by ICPMS	Total Selenium	mg/L	0.001	<0.001	**0.002**	<0.001	<0.001
CE177051	Trace Metals (Total) in Water by ICPMS	Total Vanadium	mg/L	0.001	**0.020**	**0.027**	**0.003**	<0.001
CE177051	Mercury (dissolved) in Water	Mercury	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005
CE177051	Mercury (total) in Water	Total Mercury	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005

Blue shading: ANZG (2018). Exceeds trigger values for freshwater aquatic ecosystems (95% species protection level)

Green shading: ANZG (2018). Exceeds recommended guideline limits for Livestock Drinking Water.

Attachment L: Literature review: Aluminium solubility

7.1 Aluminium solubility in circumneutral waters

Aluminium is usually present in natural waters in concentrations below 1 mg/L, except in areas with low soil pH (acidic), where the aluminium content may be as high as 10 mg/L, due to the increased solubility of aluminium oxides and clay minerals (Galvin 1996)[1]. Aluminium typically forms during the mineral weathering of feldspars and micas, and subsequently reports to clay minerals. The bioavailability and toxicity of aluminium is generally greatest in more acidic solutions. However, the pH indicates that the Esmeralda groundwater samples are circumneutral to alkaline, rather than acidic. Aluminium has been demonstrated to have increased solubility below pH 6 and above pH 9 (**Figure 7-1**, Conyers, 1990[2]; Bache, 1986[3]) but is thought to be largely insoluble at neutral pH 6 to 9. The elevated aluminium concentrations are therefore unexpected and warrant further investigation.

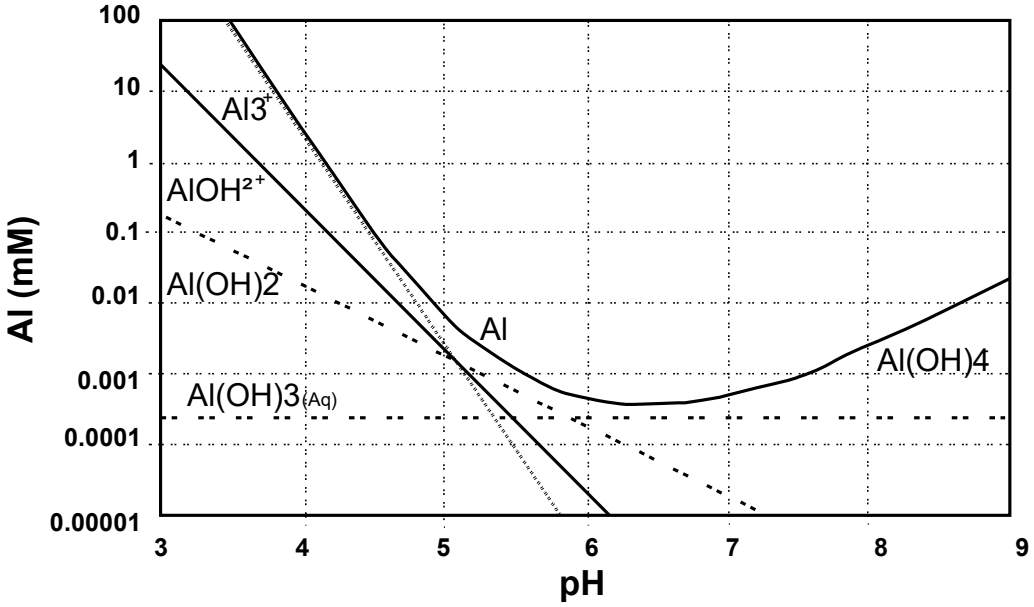


Figure 7-1: Concentration and state of aluminium (Al) species according to pH

The details of aluminium solubility are also complicated by the formation of partially dissociated $Al(OH)_3$ species and complexing between aluminium and organic matter (Eq 1).

$Al(OH)_3(S)+ OH(aq)$ ^ $Al(OH); Al(OH)_3(s)$ ^ $Al(a+q)+ 3OH-aq)$ (Equation 1)

Although aluminium is soluble at high pH, alkaline waters are uncommon as they absorb acid gases, (e.g. CO_2 and SO_2) from the atmosphere. However, alkaline rivers with aluminium mobility are known. For example, the industrial process for abstracting aluminium from bauxite involves leaching the ore with strong sodium hydroxide (NaOH) solutions. In Jamaica, discharge of wastes from bauxite processing produces freshwater streams with high pH (>8) in addition to high sodium and aluminium concentrations. As these stream waters evolve, the pH falls to approximately pH 8 and the dissolved aluminium: sodium ratio declines as the aluminium precipitates (Lew, 2024[4]). This rise and fall in pH mechanism may help to explain the observed aluminium concentrations in the circumneutral Esmeralda project groundwater samples.

[1] Galvin,R.M. (1996). Occurrence of metals in waters: an overview. Water SA 22:7–18.

[2] Conyers, M. (1990). The control of aluminium solubility in some acidic Australian soils. *Journal of Soil Science*, *41*(1), 147-156.

[3] Bache, B. W. (1986). Aluminium mobilization in soils and waters. *Journal of the Geological Society*, *143*(4), 699-706.

[4] Lew (2024). Environmental Chemistry: Aluminium solubility and acidity. Online resource available from: https://www.drdarrinlew.us/environmental-chemistry-3/ Accessed 24 October 2024.

An alternative explanation is that the aluminium may be present in a colloidal form that passes through a 0.45 μm filter, reporting higher than expected values for dissolved aluminium. This issue can be resolved by passing the water sample through a 0.01μm filter, to remove these colloids and measure the actual concentration of dissolved aluminium. Measured through a 0.45 mm filter, the dissolved Al concentrations range from 0.008 to 1.0 mg/L and can be slightly above than the applied freshwater aquatic ecosystem (95% species protection) guideline values. However, total concentrations are much higher and suggest that soluble aluminium is mostly associated with larger particles (e.g., organic complexes).

In the absence of organic matter, Al^{3+} is the predominant Al species at low pH (pH < 4; Abreu et al., 2003[5]). As the pH increases above 5.5, Al hydroxide complexes become increasingly important, and can dominate aqueous Al speciation in waters with low amounts of organic matter. The distribution of Al species changes dramatically in the presence of even moderate amounts of organic carbon (quantified as DOC). When 5 mg/L of DOC is present, organic Al complexes are by far the most important of the dissolved Al species at pH values below 8 (**Figure 9-2**).

The importance of organic complexes to the overall speciation of Al explains why organic carbon has such a large effect on Al solubility. In the absence of DOC, Al solubility in equilibrium with amorphous Al hydroxide (gibbsite) is elevated at low pH as the free Al^{3+} ion in the absence of DOC; Al^{3+} dominates the speciation of dissolved Al at low pH. As the pH increases, hydrolysis leads to the formation of $Al(OH)^{2+}$ and $Al(OH)_2^{+}$ and lower solubility until the anionic aluminate ion $Al(OH)^{4-}$ predominates at pH greater than 7 (**Figure 9-1**, Abreu et al., 2003).

The solubility minimum occurs at this transition from cationic to anionic Al species. In the presence of organic matter, the organically complexed Al is the most important form of the metal over a wide range of pH values that typically span between approximately 5 and 8. The formation of organic Al complexes results in considerable increases in Al solubility in circumneutral pH conditions. However, the increased solubility in the presence of organic matter still cannot result in high enough Al concentrations to allow dissolved Al forms to be sufficient to explain toxicity to aquatic organisms in circumneutral pH conditions.

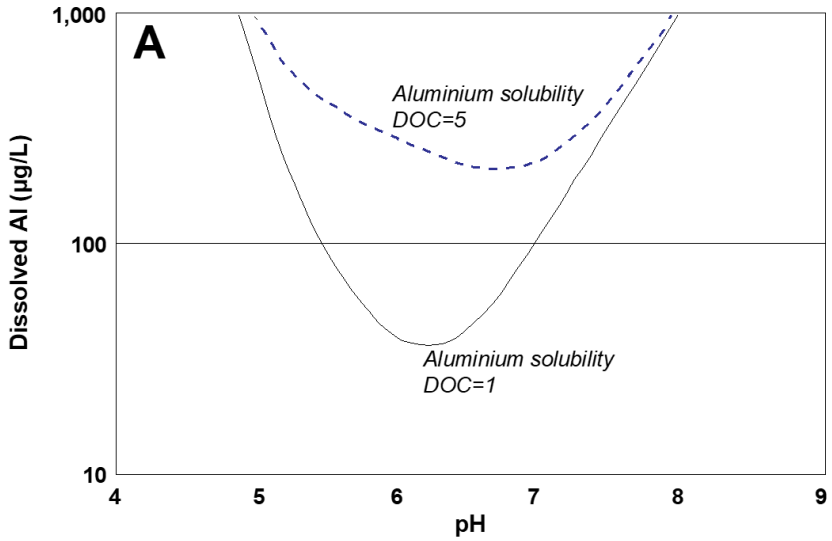


Figure 7-2: Predicted aluminium (Al) solubility as a function of pH and concentration of dissolved organic carbon (DOC) at 25°C

The solubility of Al in the presence of graphitic carbon is yet to be studied in the literature, although similar carbon-oxygen mechanisms may be taking place.

[5] Abreu Jr, C.H., Muraoka, T. and Lavorante, A.F., 2003. Exchangeable aluminium evaluation in acid soils. *Scientia Agricola*, *60*(3), pp.543-548.

Attachment M: Assay data graphs

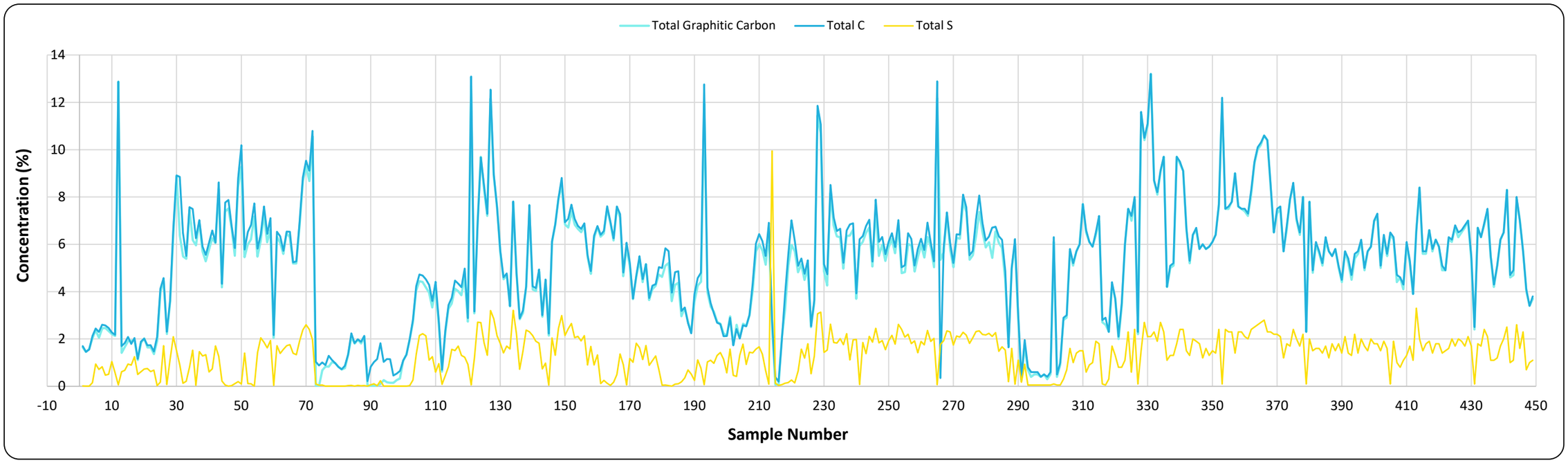


Figure 7-3: Assay data graph for total carbon, graphitic carbon, and total sulfur (part 1)

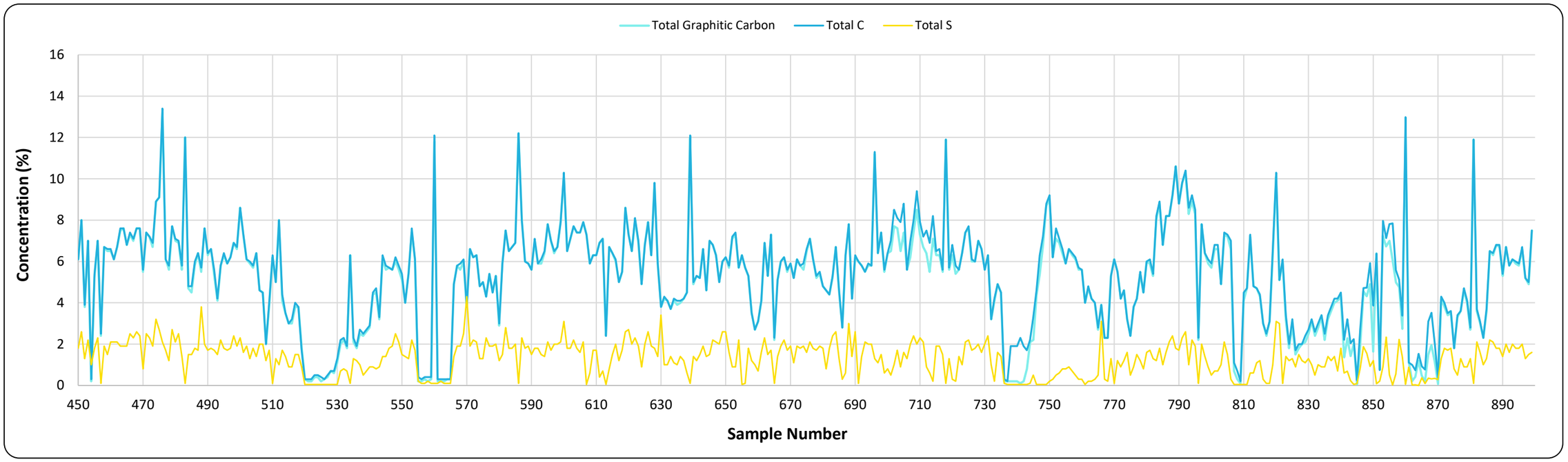


Figure 7-4: Assay data graph for total carbon, graphitic carbon, and total sulfur (part 2)

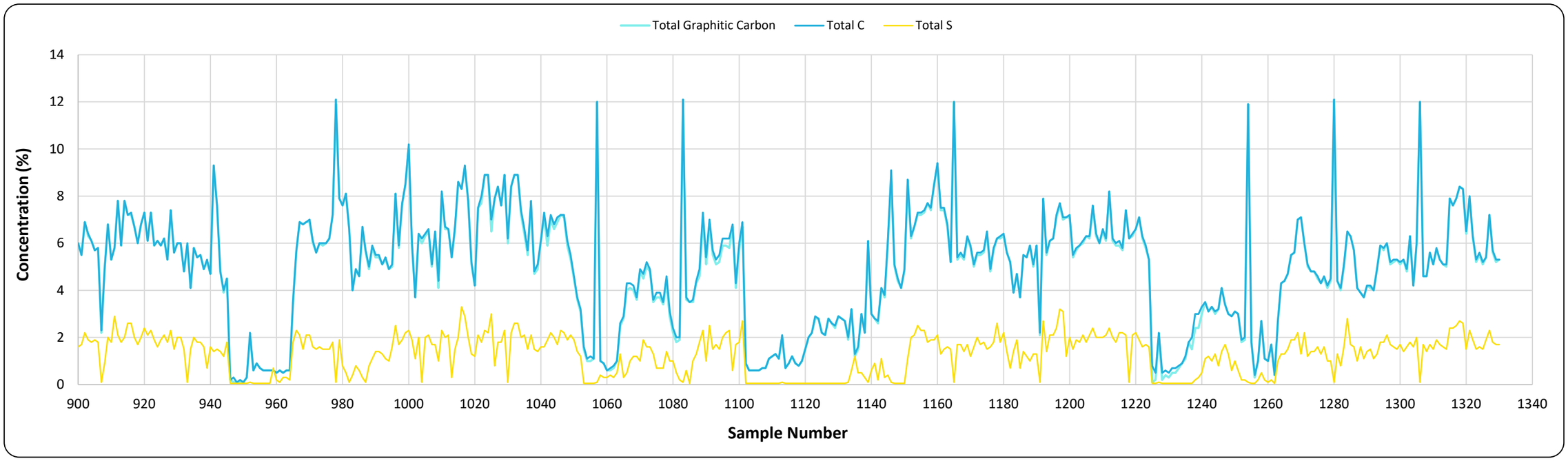


Figure 7-5: Assay data graph for total carbon, graphitic carbon, and total sulfur (part 3)

Table 7-2: Batch 2 Tailings Feed Composite - 3.2 t Pilot Plant Drill Cores

Hole ID	Tray	Meterage
24ESD001B	1 & 2	73 – 260 m
24ESMD001	3 & ½ of 4	114 – 237 m
24ESMD002	½ of 4 & 5	60.5 – 223.6 m
24ESD004	6	92 – 220 m
24ESMD005	7	174.5 – 241 m

Table 7-3: Sulfur Assay Data for 3.2 t Pilot Plant Drill Cores

Hole ID	Number of Samples	Minimum S (%)	Maximum S (S)	Average S (%)
24ESD001B	187	<0.1	5.1	1.7
24ESMD001	123	<0.1	3.0	1.4
24ESMD002	223	<0.1	3.1	1.3
24ESD004	128	<0.1	2.8	1.5
24ESMD005	180	<0.1	2.8	1.5
Total	**841**	**<0.1**	**3.4**	**1.5 %**

Attachment N: Sample catalogue

SAMPLE CATALOGUE

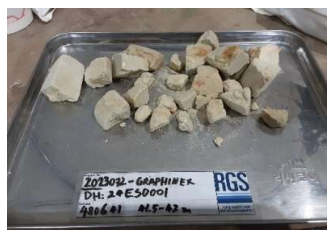
RGS MINE WASTE AND WATER MANAGEMENT

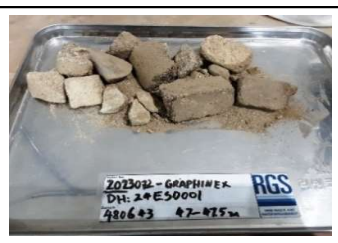
Client:	AARC & Graphinex	Coordinates:	628400	Easting	
Project:	2023072 AARC Graphinex		7918700	Northing	
Site:	Esmeralda Project	Elevation:			
Method:	Diamond Drill Hole	Logged by:	Esmeralda		
Contractor:	AARC Environmental Solutions P/L	Datum:	MGA94_54		
Log Date:	Sep-24	Page:	1 of 1		

DRILL HOLE:

Hole ID:	24ESD001
Client ID:	
Top of Hole:	0.0 m
End of Hole:	136.3 m

Key		Weathering
	Alluvium	Extreme
	Claystone	Extreme
	Bedded Sandstone	Highly
	Interbedded Siltstone	Highly
	Massive Sandstone	Highly
	Metasediment	Fresh
	Granite Breccia	Fresh
	Dolerite	Fresh

Depth	Unit	Graphic	Material	Moisture	Strength	Density	Notes and photographs	Mass (kg)	Sample no.
0			Alluvium - soil 0.3-1m Extremely weathered Orangish brown, well sorted	D	VS	VL		4.692	480634
2			Claystone - overburden 3-3.5m Extremely weathered						
4			Light yellowish brown, well sorted moderately cohesive	D	F	MD		1.632	480635
8			Claystone - overburden 8.5-9m Extremely weathered Medium brown, well sorted						
10				D	F	MD		1.904	480636
12									
14			Claystone- overburden 14-14.5m Extremely weathered Medium brown, well sorted	D	F	MD		2.568	480637
16									
18			Claystone - overburden 19.5-20m Extremely weathered Brown, moderately sorted	D	F	MD		1.741	480638
20									
22				D	F	MD		1.935	480639
24			Claystone - overburden 25-25.5m Extremely weathered						
26			Yellowish brown, moderately sorted	D	F	MD		2.204	480640
28									
30			Claystone - overburden 30.5-31m Extremely weathered Orangish brown, well sorted	D	St	MD		1.98	480641
32									
34			Sandstone bedded - overburden 36-36.5m Moderately weathered Light cream, well sorted	D	VSt	VD		1.969	480642
36									

38											
40			Sandstone bedded - overburden 41.5-42m Highly weathered Light brown, moderately sorted	9	10	D	VSt	VD		1.935	480643
42											
44					11	D	VSt	VD		2.026	480644
46			Sandstone bedded - overburden 47-47.5. Highly weathered Light grey, moderately sorted	10							
48											
50											
52			Sandstone bedded - overburden 52.5-53m Fresh Light brown, well sorted	11							

Moisture: D - dry; M - moist; W - wet | Strength: H - hard; VSt - very stiff; St - stiff; F - firm; S - soft; VS - very soft | Density: VD - very dense; MD - medium dense; L - loose; VL - very loose

SAMPLE CATALOGUE

Client:	AARC & Graphinex	Coordinates:	628407.83	Easting	
Project:	2023072 AARC Graphinex		7918700.349	Northing	
Site:	Esmeralda Project	Elevation:			
Method:	Diamond Drill Hole	Logged by:	Esmeralda		
Contractor:	AARC Environmental Solutions P/L	Datum:	MGA94_54		
Log Date:	Sep-24	Page:	1 of 1		

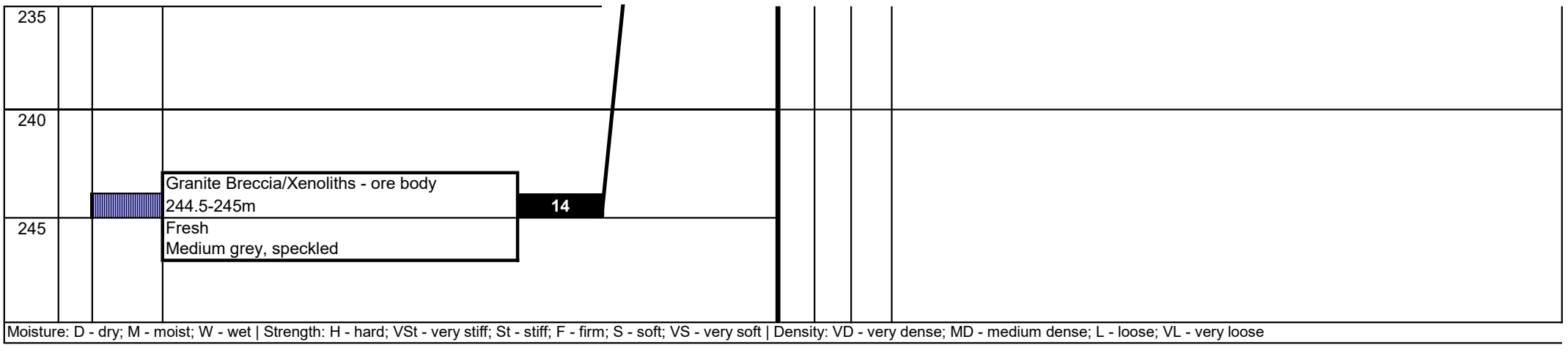
DRILL HOLE:

Hole ID:	24ESD001B	
Client ID:		
Top of Hole:	74m	
End of Hole:	245m	

Key	Weathering
Alluvium	Extreme
Claystone	Extreme
Bedded Sandstone	Highly
Interbedded Siltstone	Highly
Massive Sandstone	Highly
Metasediment	Fresh
Granite Breccia	Fresh
Dolerite	Fresh

Depth	Unit	Graphic	Material	Moisture	Strength	Density	Notes and photographs	Mass (kg)	Sample no.
70			Granite Breccia/Xenoliths - Low grade ore 74-74.5m Fresh Light grey, speckled	D	H	VD		1.736	480647
75									
80				D	H	VD		2.005	480648
85			Granite Breccia/Xenoliths - Low grade ore 89.5-90m Fresh Meidum grey, speckled						
90				D	H	VD		2.062	480649
95			Metasediments - ore body 98.6-99.1m Fresh Dark grey						
100				D	H	VD		2.111	480650
105			Granite Breccia/Xenoliths - Low grade ore 105-105.5m Fresh Medium grey, speckled						
110				D	H	VD		2.199	480651
115									
120			Granite Breccia/Xenoliths - ore body 120.5-121m Fresh Medium grey, speckled	D	H	VD		2.103	480652
125									
130				D	H	VD		2.31	480653
135			Granite Breccia/Xenoliths - ore body 136-136.5m Fresh Medium grey, speckled						
140				D	H	VD		2.127	480654
145									

150	Granite Breccia/Xenoliths - ore body 151.5-152m Fresh Medium grey, speckled	7	9	D	H	VD		2.086	480655
155									
160			10	D	H	VD		1.813	480656
165	Granite Breccia/Xenoliths - ore body 167-167.5m Fresh Medium grey, speckled	8							
170			11	D	H	VD		2.026	480657
175									
180	Granite Breccia/Xenoliths - ore body 182.5-183 Fresh Medium grey	9	12	D	H	VD		2.063	480658
185	Metasediments - ore body 184.3-184.8 Fresh Medium grey	10							
190			13	D	H	VD		2.027	480659
195									
200	Granite Breccia/Xenoliths - Low grade ore 198-198.5m Fresh Medium grey, speckled	11	14	D	H	VD		1.999	480660
205									
210	Granite Breccia/Xenoliths - ore body 213.5-214m Fresh Medium grey, speckled	12							
215									
220									
225									
230	Granite Breccia/Xenoliths - ore body 229/229.5m Fresh Medium grey, speckled	13							



Moisture: D - dry; M - moist; W - wet | Strength: H - hard; VSt - very stiff; St - stiff; F - firm; S - soft; VS - very soft | Density: VD - very dense; MD - medium dense; L - loose; VL - very loose

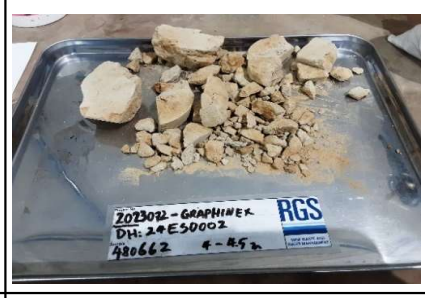
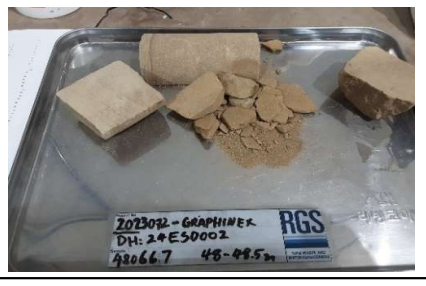
SAMPLE CATALOGUE

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Site:	Esmeralda Project	Elevation:			
Method:	Diamond Drill Hole	Logged by:	Esmeralda		
Contractor:	AARC Environmental Solutions P/L	Datum:	MGA94_54		
Log Date:	Sep-24	Page:	1 of 1		

DRILL HOLE:

Hole ID:	24ESD002	
Client ID:		
Top of Hole:	0.3m	
End of Hole:	52.5m	

Key		Weathering
	Alluvium	Extreme
	Claystone	Extreme
	Bedded Sandstone	Highly
	Interbedded Siltstone	Highly
	Massive Sandstone	Highly
	Metasediment	Fresh
	Granite Breccia	Fresh
	Dolerite	Fresh

Depth	Unit	Graphic	Material	Moisture	Strength	Density	Notes and photographs	Mass (kg)	Sample no.
0			Alluvium - soil 0.3-1m Extremely weathered Medium brown, poorly sorted	D	VS	VL		4.688	480661
5			Claystone - overburden 4-4.5m Extremely weathered Cream, moderately sorted						
10			Claystone - overburden 9.5-10m Extremely weathered Dark brown, poorly sorted	D	S	L		2.063	480662
15									
20			Claystone - overburden 20-20.5m Extremely weathered Dark reddish brown Poorly sorted	D	S	L		1.582	480663
25									
30				D	S	L		1.456	480664
35									
40			Claystone - overburden 41-41.5m Extremely weathered Cream, well sorted	D	Vst	VD		2.294	480666
45			Sandstone bedded - overburden 48-48.5m Highly weathered Light brown, well sorted						
50			Siltstone - overburden 52-52.5m Highly weathered Dark grey, well sorted	D	St	MD		1.786	480667
				D	F	L		2.406	480668

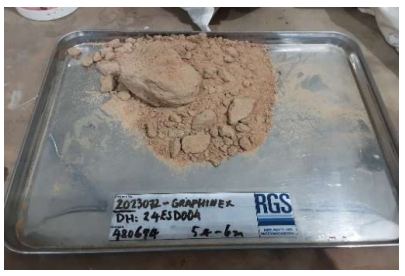
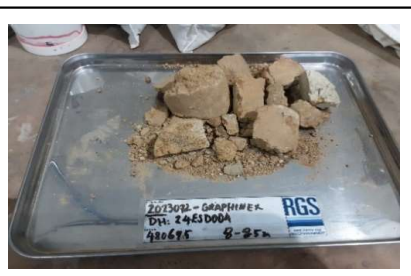
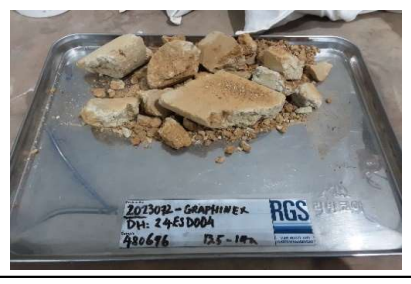
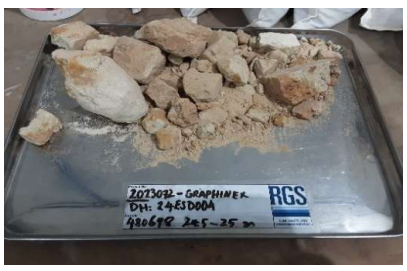
Moisture: D - dry; M - moist; W - wet | Strength: H - hard; VSt - very stiff; St - stiff; F - firm; S - soft; VS - very soft | Density: VD - very dense; MD - medium dense; L - loose; VL - very loose

SAMPLE CATALOGUE

RGS MINE WASTE AND WATER MANAGEMENT

Client:	AARC & Graphinex	DRILL HOLE:	Hole ID:	24ESD004	
Project:	2023072 AARC Graphinex		Client ID:		
Site:	Esmeralda Project	Coordinates:	Top of Hole:	5.4m	
Method:	Diamond Drill Hole	Elevation:	End of Hole:	211.5m	
Contractor:	AARC Environmental Solutions P/L	Logged by:	628200	Easting	
Log Date:	Sep-24	Datum:	7918701	Northing	
		Page:	MGA94_54		
			1 of 1		

Key	Weathering
Alluvium	Extreme
Claystone	Extreme
Bedded Sandstone	Highly
Interbedded Siltstone	Highly
Massive Sandstone	Highly
Metasediment	Fresh
Granite Breccia	Fresh
Dolerite	Fresh

Depth	Unit	Graphic	Material	Moisture	Strength	Density	Notes and photographs	Mass (kg)	Sample no.
0									
5			Alluvium - soil 5.4-6m Extremely weathered Medium brown, well sorted	D	VS	VL		2.286	480694
10			Claystone - overburden 8-8.5m Extremely weathered Yellowish brown, well sorted	D	S	L		2.313	480695
15			Claystone - overburden 13.5-14m Extremely weathered Light brown, moderately sorted						
20			Claystone - overburden 19-19.5m Extremely weathered Reddish brown, well sorted	D	F	L		2.611	480696
25			Claystone - overburden 24.5-25m Extremely weathered Light brown to cream Moderately sorted						
30			Claystone - overburden 30-30.5m Extremely weathered Beige, moderately sorted	D	F	L		2.64	480697
35									
40			Sandstone bedded - overburden 40-40.5m Highly weathered Light brown to reddish brown	D	F	VL		2.199	480698
45			Sandstone bedded - overburden 45.5-46m Highly weathered Light brown, well sorted						
50			Sandstone bedded - overburden 51-51.5m Highly weathered Muddy brown	D	F	L		2.411	480699
55			Sandstone bedded - overburden 56.5-57m Highly weathered Light grey						
60			Siltstone - overburden 58-58.5m Highly weathered, grey	D	F	L		2.286	480700
65			Massive sandstone - overburden 62.9-63.1m Highly weathered, light grey						
70			Metasediments - waste rock 64-64.5m Fresh Light bluish grey	D	St	MD		2.273	480701
75			Metasediments - waste rock 69.5-70m Fresh Light grey						

80		Metasediments - waste rock 82-82.5m Fresh Grey, mottled	15	9	D	F	L		2.082	480702
85										
90		Granite Breccia/Xenoliths Ore body 92-92.5m Fresh, dark grey, mottled	16	10	D	VSt	VD		2.168	480703
95										
100		Granite Breccia/Xenoliths Ore body 102.5-103m Fresh, dark grey, mottled	17	11	D	St	VD		1.595	480704
105										
110				12	D	VSt	VD		1.011	480705
115		Granite Breccia/Xenoliths Ore body 118-118.5m Fresh, grey matrix with dark grey clasts	18							
120				13	D	H	VD		1.535	480706
125										
130		Granite Breccia/Xenoliths Ore body 133.5-134m Fresh, dark grey	19	14	D	H	VD		1.647	480707
135										
140				15	D	H	VD		1.693	480708
145		Granite Breccia/Xenoliths Ore body 149-149.5m Fresh, grey matrix with dark grey clasts	20							
150				16	D	H	VD		1.884	480709
155										
160		Granite Breccia/Xenoliths Ore body 164.5-165m Fresh, grey matrix with dark grey clasts	21	17	D	H	VD		1.77	480710
165										

170												
175												
180			Granite Breccia/Xenoliths Ore body 18-180.5m Fresh, grey matrix with dark grey clasts									
185												
190												
195			Granite Breccia/Xenoliths Ore body 195.5-196m Fresh, grey matrix with dark grey clasts									
200												
205												
210			Granite Breccia/Xenoliths Ore body 211-211.5m Fresh, grey matrix with dark grey clasts									
215												

				18		D	H	VD			2.024	480711
				19		D	H	VD			1.881	480712
				20		D	H	VD			1.905	480713
				21		D	H	VD			1.894	480714
				22		D	H	VD			1.754	480715
				23		D	H	VD			2.254	480716
				24		D	H	VD			2.024	480717

Moisture: D - dry; M - moist; W - wet | Strength: H - hard; VSt - very stiff; St - stiff; F - firm; S - soft; VS - very soft | Density: VD - very dense; MD - medium dense; L - loose; VL - very loose

SAMPLE CATALOGUE

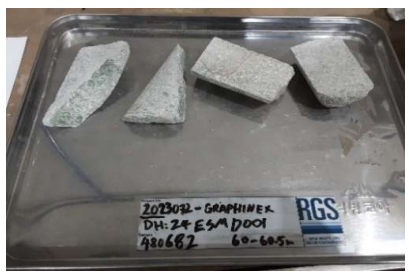
RGS MINE WASTE AND WATER MANAGEMENT

Client:	AARC & Graphinex	Coordinates:	628301.7574	Easting
Project:	2023072 AARC Graphinex		7918602.006	Northing
Site:	Esmeralda Project	Elevation:		
Method:	Diamond Drill Hole	Logged by:	Esmeralda	
Contractor:	AARC Environmental Solutions P/L	Datum:	MGA94_54	
Log Date:	Sep-24	Page:	1 of 1	

DRILL HOLE:

Hole ID:	24ESMD001	
Client ID:		
Top of Hole:	57m	
End of Hole:	210.5m	

Key	Weathering
Alluvium	Extreme
Claystone	Extreme
Bedded Sandstone	Highly
Interbedded Siltstone	Highly
Massive Sandstone	Highly
Metasediment	Fresh
Granite Breccia	Fresh
Dolerite	Fresh

Depth	Unit	Graphic	Material	Moisture	Strength	Density	Notes and photographs	Mass (kg)	Sample no.
55			Siltstone - overburden 57-57.5m Highly weathered Brownish grey	D	St	MD		1.483	480681
60			Siltstone - overburden 60-60.5m Highly weathered Light grey, speckled						
65			Granite Breccia/Xenoliths Low grade ore 70.5-71m Fresh, light grey, speckled	D	VSt	MD		1.348	480682
70									
75				D	VSt	MD		1.208	480683
80									
85			Granite Breccia/Xenoliths Low grade ore 86-86.5m Fresh, grey, speckled	D	H	VD		1.679	480684
90									
95			Dolerite - waste rock 99-99.5m Fresh, grey, speckled	D	H	VD		1.885	480685
100			Granite Breccia/Xenoliths Low grade ore 101.5-102m Fresh, bluish grey, speckled						
105				D	H	VD		1.647	480686
110									
115			Granite Breccia/Xenoliths Ore body 117-117.5m Fresh, grey matrix with dark grey clasts	D	H	VD		1.733	480687
120									
125				D	H	VD		1.748	480688
130			Granite Breccia/Xenoliths Ore body 132.5-133m Fresh, grey matrix with dark grey clasts						

135									
140			9	D	H	VD		1.721	480689
145		Granite Breccia/Xenoliths Ore body 148-148.5m	9						
150		Fresh, grey matrix with dark grey clasts	10	D	H	VD		1.818	480690
155									
160		Granite Breccia/Xenoliths Low grade ore 163.5-164m	10	D	H	VD		1.889	480691
165		Fresh, grey matrix with dark grey clasts	11						
170			11	D	H	VD		1.907	480692
175		Granite Breccia/Xenoliths Ore body	12						
180		179-179.5m Fresh, grey matrix with dark grey clasts	12	D	H	VD		1.587	480693
185									
190		Granite Breccia/Xenoliths Ore body	13						
195		194.5-194m Fresh, grey matrix with dark grey clasts	13						
200									
205		Granite Breccia/Xenoliths							
210		Ore body 210-210.5m Fresh, grey matrix with dark grey clasts							

Moisture: D - dry; M - moist; W - wet | Strength: H - hard; VSt - very stiff; St - stiff; F - firm; S - soft; VS - very soft | Density: VD - very dense; MD - medium dense; L - loose; VL - very loose

SAMPLE CATALOGUE

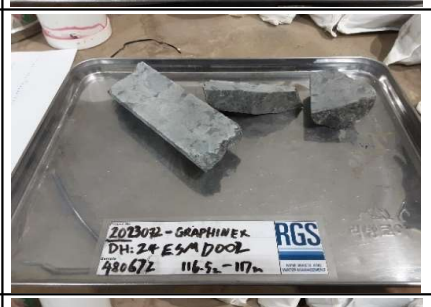
RGS MINE WASTE AND WATER MANAGEMENT

Client:	AARC & Graphinex	Coordinates:		Easting	
Project:	2023072 AARC Graphinex			Northing	
Site:	Esmeralda Project	Elevation:			
Method:	Diamond Drill Hole	Logged by:	Esmeralda		
Contractor:	AARC Environmental Solutions P/L	Datum:	MGA94_54		
Log Date:	Sep-24	Page:	1 of 1		

DRILL HOLE:

Hole ID:	24ESMD002					
Client ID:						
Top of Hole:	70					
End of Hole:	225.5m					

Key		Weathering
	Alluvium	Extreme
	Claystone	Extreme
	Bedded Sandstone	Highly
	Interbedded Siltstone	Highly
	Massive Sandstone	Highly
	Metasediment	Fresh
	Granite Breccia	Fresh
	Dolerite	Fresh

Depth	Unit	Graphic	Material	Moisture	Strength	Density	Notes and photographs	Mass (kg)	Sample no.
70			Granite Breccia/Xenoliths Ore body 70-70.5m Fresh, grey matrix with dark grey clasts	D	H	VD		1.787	480669
75									
80								1.597	480670
85			Granite Breccia/Xenoliths Ore body 85.5-86m Fresh, grey matrix with dark grey clasts						
90				D	H	VD		2.048	480671
95									
100			Granite Breccia/Xenoliths Ore body 101-101.5m Fresh, grey matrix with dark grey clasts	D	H	VD		1.816	480672
105									
110				D	H	VD		2.031	480673
115			Granite Breccia/Xenoliths Ore body 116.5-117m Fresh, grey matrix with dark grey clasts						
120			Metasediments Waste rock	D	H	VD		1.904	480674
125			124-124.5m Fresh, grey						
130			Granite Breccia/Xenoliths Low grade ore 132-132.5m Fresh, grey matrix speckled	D	H	VD		2.047	480675
135									
140				D	H	VD		2.162	480676
145			Granite Breccia/Xenoliths Ore body 147.5-148m Fresh, grey matrix with dark grey clasts						

150									
			9	D	H	VD		2.218	480677
155									
160		Granite Breccia/Xenoliths Ore body 163-163.5m Fresh, dark grey	8						
			10	D	H	VD		2.298	480678
165									
170									
			11	D	H	VD		1.904	480679
175		Granite Breccia/Xenoliths Ore body 178.5-179m Fresh, grey matrix with dark grey clasts	9						
180									
			12	D	H	VD		1.834	480680
185									
190		Granite Breccia/Xenoliths Ore body 194-194.5m Fresh, grey matrix with dark grey clasts	10						
195									
200									
205		Granite Breccia/Xenoliths Ore body 209.5-210m Fresh, grey matrix with dark grey clasts	11						
210									
215									
220		Granite Breccia/Xenoliths Ore body 225-225.5m Fresh, grey matrix with dark grey clasts	12						
225									
230									

Moisture: D - dry; M - moist; W - wet | Strength: H - hard; VSt - very stiff; St - stiff; F - firm; S - soft; VS - very soft | Density: VD - very dense; MD - medium dense; L - loose; VL - very loose



MINE WASTE AND
WATER MANAGEMENT