Baseline Soil and Sediment Testing

Eramurra Salt Project

Leichhardt Salt Pty Ltd

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DEFINITIONS AND ABBREVIATIONS

Acronym	Definition	Acronym	Definition
AASS	Actual Acid Sulfate Soil	Mg	Magnesium
Al	Aluminium	Mn	Manganese
ALS	Australian Laboratory Services	MS	Ministerial Statement
ANC	Acid neutralising capacity	Mtpa	Million tonnes per annum
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council, 1999 as amended 2013	Na	Sodium
ASS	Acid sulfate soil	NaCl	Sodium chloride
ANZECC	Australian and New Zealand Environment and Conservation Council	NATA	National Associated of Testing Authorities
Ca	Calcium	NEPC	National Environment Protection Council
CEC	Cation exchange capacity	PASS	Potential Acid Sulfate Soils
CMW	CMW Geosciences	PCOC	Potential chemical substances of concern
Cl	Chloride	pH	Measure of the activity of hydrogen ions in solution
COC	Chain of custody	pH_F	pH field
CPT	Cone penetration test	pH_{FOX}	pH field oxidation
CRS	Chromium reducible sulfur	The Project	Eramurra Solar Salt Project
DMIRS	Department of Mines Industry Regulation and Safety	QA/QC	Quality Assurance/ Quality Control
DWER	Department of Water and Environmental Regulation	SO_4	Sulfate
DI	De-ionised	TKN	Total Kjeldahl nitrogen
EC	Electrical conductivity	TN	Total nitrogen

Acronym	Definition	Acronym	Definition
EPA	Environmental Protection Agency	TOC	Total organic carbon
ESD	Environmental scoping document	TP	Total phosphorous
Fe	Iron	WA	Western Australia
JSEA	Job Safety Environmental Analysis	WHSMP	Work Health and Safety Management Plan
K	Potassium	WQA	Water Quality Australia
Leichhardt	Leichhardt Salt Pty Ltd	XRD	X-ray diffraction
LWC	Land and Water Consulting		

1 INTRODUCTION

1.1 OVERVIEW

Land and Water Consulting (LWC) was engaged by Leichhardt Salt Pty Ltd (Leichhardt) to undertake soil and sediment testing to inform the Baseline Soil and Sediment Assessment for the Eramurra Salt project. The project is located in the western Pilbara region of western Australia (WA), approximately 55 km west-south-west of Karratha (the Site). A site locality plan is presented as Figure 1.

1.2 BACKGROUND

Leichhardt proposes to construct and operate the Eramurra Solar Salt Project, a solar salt project to extract up to 4.2 million tonnes per annum (Mtpa) of high-grade salt (Sodium Chloride (NaCl)) from seawater, using a series of evaporation and crystallisation ponds and processing plant, transport corridor, stockpiling and export from the Cape Preston East Port (the Project). The evaporation and crystalliser ponds will be located on a Mining Lease.

The export of salt is proposed to be via a trestle jetty. Bitterns will be transported by pipeline attached to the trestle jetty structure and discharged via a diffuser located off the trestle jetty. The jetty and associated stockpiles will be located at the Cape Preston East Port approved by Ministerial Statement (MS) 949. Dredging of the proposed channel and berth pocket will be undertaken as part of the Project to remove high points at the Cape Preston East Port. Dredged material will either be disposed of at one or more offshore disposal locations, or onshore within the Ponds and Infrastructure Development Envelope. The Cape Preston East Port jetty and associated stockpiles are excluded from the current Project proposal captured by the draft Environmental Scoping Document.

1.3 OBJECTIVE

The objective of this assessment was to complete baseline soil and sediment testing as per the draft Environmental Scoping Document (ESD) for the Eramurra Solar Salt Project (the Proposal) and subsequent draft Environmental Protection Agency (EPA) and Department of Mines Industry Regulation and Safety (DMIRS) response comments, specifically:

- #80 - Undertake a baseline soil assessment of the proposed Pond and Infrastructure Development Envelope including physical (i.e. particle size) and chemical (e.g. metals and hydrocarbons) characteristics.
- #82 - Undertake a study to identify any acid sulfate soil (ASS) that could potentially be disturbed by the Proposal and if required, prepare an ASS management plan to prevent contamination of the terrestrial and aquatic environment.

1.4 SCOPE OF WORKS

The following scope of works was adopted:

- Design of a sampling program with sufficient coverage across the Project area to inform a baseline assessment with respect to the draft ESD and EPA/DMIRS comments.
- Collection of samples for laboratory analysis during the geotechnical investigations undertaken in August to September 2021. Samples were collected by CMW Geosciences (CMW) with laboratory analysis managed by LWC.

- Collection of samples for laboratory analysis during algal mat investigations undertaken in December 2021. Samples were collected by Leichhardt with laboratory analysis managed by LWC.
- Collection of samples for laboratory analysis from targeted areas across the western portion of the Project area as well as grid based samples from the eastern portion of the Project area in March 2022. Samples were collected by both LWC and Leichhardt and all laboratory analysis was managed by LWC.
- Submission of soil/ sediment samples for laboratory analysis of potential chemical substances of concern (PCOC); and
- Preparation of a factual report detailing the adopted approach and methodology, results of the sampling events, assessment of soil/ sediment quality with respect to relevant state and national guidance and an assessment of the suitability of the data to be utilised as a basis of interpretation.

2 SITE SETTING

The Project area use and environmental setting is summarised in Table 2-1.

Table 2-1 Site Environmental Setting

Item	Description
Topography	The Project area fringes a low-lying coast. The central and eastern parts of the Project area comprise a line of coastal beach ridges, dunes and cheniers forming a coastal barrier rising locally to over 12 m along the crest of the main dune. A backwater has formed behind the coastal barrier and this area is referred to as inter and supra-tidal flats. Several small (high tide) islands are present in the backwater and these provide evidence of former coastlines which are now partially buried beneath the lagoonal sediments associated with the backwater. Mangroves fringe the western aspect of this area. Inland of inter and supra-tidal flats is an area of alluvial outwash. The land falls at a gradient of about 1 m in 300 m from the southeast towards the northwest.
Climate	The Project area has an arid climate characterised by hot, humid summers with less than 350 mm of rain per year. Based on information collected at the Dampier Salt weather station (ID5061 located around 40 km north-east of the Project area), the mean maximum temperatures range from around 26°C in winter to 36°C in summer and the average annual rainfall is around 266 mm with most of the rainfall occurring January to June. Rainfall is lowest generally from July to December.
Geology	A desktop geological study was undertaken by CMW Geosciences in 2020. Field based studies have since been completed and are, in part, reported in this document.
Hydrogeology	The outcomes of this assessment will inform the understanding of hydrogeological conditions across the Project area.
Hydrology	Several creeks dissect the alluvial outwash plain. The creeks are generally small as the catchment is not large and the watershed is roughly coincidental with the position of the Northwest Coastal Highway. However, along the eastern edge of the Project area is a larger creek called Devil Creek which drains a larger inland area, as does Eramurra Creek that follows the western aspect of the Project area. McKay Creek is present through the central portion of the Project area.
Acid Sulfate Soils	The coastal soils within the Project area are described as possessing a high risk, moderate and low risk of containing acid sulfate soil (ASS) within 3m of current ground surface. Each risk ranking is dependent on the soil/sediment type and depth to groundwater. The assessment of ASS is reported in this document.
Areas of Environmental Value	An area of ecological significance exists (nature conservation) at the mouth of Eramurra Creek where the creek flows to the ocean. This estuarine area is known to be an area used by the local turtle population and is the focus of marine studies for the Project. A community of mangroves and algal mats exists within the inter tidal area and these plants and mats likely provide food for a range of species in the area and are also likely to be important regulators of nutrients to the marine environment. Samphire species are a coastal terrestrial plant species that present a potential environmental value requiring protection. An additional terrestrial plant species of value are the eucalypt species within the Project area. These may be threatened by the development of the Project through impacts to the vadose zone from saline seepage.

Item	Description
	In a recent review of stygofaunal studies of the Pilbara coastline (Sacco et al., 2022), a significant knowledge gap with respect to the habitats and species within the Pilbara populations was identified. The authors noted that the Pilbara coastline is considered a "hotspot" for stygofauna, with communities most likely to be found in a range of hydrogeological settings such as karstic calcrete and dolomites, pisolites, fractured rock, porous alluvials and enclosed pools with underground connection to the ocean (anchialine hydrogeological systems). The Project area is host to such settings with the exception being pisolites and possibly anchialine systems. Bennelongia (2022) identified 11 species of stygofauna within the Project area. None of the species identified are restricted meaning the habitat is non-unique. Changes to the environment may alter the spatial distribution of the species within the Project, however, the changes are unlikely to decrease the species richness. Given the current land use as pastoral land, stock watering wells are considered a potential environmental value to be protected. Devils pool, a surface water pool within Devils Creek, has the potential to be impacted by increases in groundwater salinity. Little is known about the water balance of this pool and whether the pool is a surface expression of groundwater or if connection to groundwater exists. The pool is therefore considered as an environmental value that requires protection. The Santos pipeline will likely be affected by groundwater flow and level changes due to seepage from the ponds. The presence of the ponds may lead to artesian groundwater conditions resulting in groundwater expressions at the surface which may, in turn, lead to waterlogged soils. This may increase the footprint of ASS conditions particularly if waterlogged soils occur in close proximity to the coastal units.
Surrounding Land uses	The predominant land use in the area surrounding the Project area appears to generally comprise pastoral land use. The Devil Creek Gas Plant pipeline (leading from the plant to the coast) transects the north-eastern portion of the Site. The North-west Coastal Highway bounds the project area along its south western to eastern boundary.
Current Land use	The Project area is currently designated as pastoral land and part of the Project area is used for grazing purposes.
Proposed Land use	Development as a solar salt production facility.

3 APPROACH AND METHODOLOGY

The approach and methodology adopted was formulated to inform the baseline soil and sediment assessment for the Project. This was undertaken with reference to desktop investigations undertaken for the Project[1,2], the EPA/DMIRS's response to Leichhardt's project proposal submission and relevant guideline documentation. The methodology adopted to deliver the scope of works is detailed in the following sub-sections.

3.1 PREPARATION WORKS

Prior to commencing any ground works, personnel undertaking the sampling works completed the required inductions. A comprehensive Work Health and Safety Management Plan (WHSMP) was prepared which included a Job Safety Environmental Analysis (JSEA) for any and all activities to be executed. Access to the Project area was organised by Leichhardt.

3.2 SAMPLING METHODOLOGY

In order to select the number of sampling locations, a combination of targeted and grid-based sampling methods was adopted as detailed in Table 3-1. A sample location plan is presented as Figure 2.

Table 3-1 Summary of Soil/ Sediment Samples in Each Area of Interest

Area of interest	Number of samples collected	Timing of Sampling Event	Company Responsible for Sampling	Notes
Phase 1				
Western pond area and algal mats along the coastal aspect of the Project area	464 Test pits samples 54 CPTs samples 63 surface samples	August/ September 2021 and December 2021	CMW	Investigation targeted the portion of the Project area located to the west of the Santos Gas Pipeline as well as the algal mats along the coastal aspect of the Project area. Samples were collected during the test pits and CPT investigations as well as during algal mat sampling event. CMW collected the samples and LWC managed the laboratory analysis.
Phase 2				
Perimeter outside pond footprint	14	March 2022	LWC	Investigation to meet the EPA request of including sampling across the entire

[1] CMW (2020) Eramurra Salt, Cape Preston, WA – Geotechnical Desk Top Study Report for Eramurra Salt Ponds prepared by CMW Geosciences for Leichhardt Industrials Pty Ltd on 3 August 2020; and

[2] LWC (2021) Desktop study of soils, sediments and groundwater quality – Eramurra Salt Project, Pilbara Coast, Western Australia prepared by Land & Water Consulting for Leichhardt Industrials Pty Ltd in 27 January 2021.

Area of interest	Number of samples collected	Timing of Sampling Event	Company Responsible for Sampling	Notes
Access route area in north-western corner of project area	4	March 2022	LWC	project tenement, not just beneath the footprint of the ponds. LWC collected samples and managed laboratory analysis.
Monitoring well locations	11	March 2022	LWC	
Surface water sampling locations	14	March 2022	LWC	
Infill sampling in Phase 1 investigation area	3	March 2022	LWC	
Additional sampling at algal mat collection points	10	March 2022	Leichhardt	Grid based surface sampling strategy adopted where a 1.6km grid was used to determine the number of sample locations. Generally consistent with the approach for the Phase 1 soil investigation in the western ponds area. Leichhardt collected the samples and LWC managed the laboratory analysis.

Test pit samples were collected directly from the excavator bucket using a dedicated pair if nitrile gloves. A similar process was adopted for CPT sample locations. Surface soil samples were collected using a clean trowel at each location. Soils were logged in accordance with AS1726-2017 Geotechnical Site Investigations by an experienced Environmental Scientist. The presence of evidence of contamination (e.g. suspicious fill, staining or odour) or potential acid sulfate material was noted, where relevant.

A fresh pair of nitrile disposable gloves was worn for the collection of each sample. ASS samples were collected into snap lock plastic bags. All air was removed prior to sealing the bags. The samples were placed on ice in an insulated cooler, and then frozen on site.

Soil samples collected for hydrocarbon analysis were placed in laboratory-supplied, cleaned glass jars with Teflon lined lids which were sealed, labelled and placed on ice in an insulated cooler prior to transport to the laboratories under standard LWC Chain of Custody (COC) protocols which are consistent with the requirements of Schedule B(2) of the ASC NEPM (1999, as amended 2013). All samples were clearly labelled with unique sample identification numbers consisting of the date, sample location and project number.

The adopted analytical schedule for the soil and sediment assessment is summarised in Table 3-2. The purpose of this assessment was to establish baseline conditions across the project area and the analytical schedule was selected to reflect this purpose. Based on field observations the adopted analytical program was amended as appropriate depending on the type of material encountered.

Blind coded intra-laboratory duplicates and inter- laboratory duplicates were collected as per Table 3-2. It is noted that, for the most part, the duplicate frequency did not meet the frequency of one duplicate pair per 20 primary samples. This is discussed further in Section 4.6. Noting that volatile compounds were not considered to be a primary PCOC, no trip-blanks were considered required. Similarly, given that dedicated sample equipment (nitrile gloves) was utilised for sample collection, the potential for cross-contamination was considered to have been mitigated and so no rinsate blanks were required.

Eurofins was the primary laboratory for the soil and groundwater analytical program and the secondary laboratory was a combination of ChemCentre and ALS. Eurofins, ChemCentre and ALS are NATA accredited for the entire proposed analytical program.

Table 3-2 Summary of Adopted Analytical Schedule

Analysis	Number of Primary Samples	Number of Intra-Laboratory Duplicates/ Duplicate Ratio	Number of Inter-Laboratory Duplicates/ Duplicate Ratio
Particle size analysis (laser diffraction method)	55	0	0
Total organic carbon	134	3 1:45	3 1:45
Cation exchange capacity	134	3 1:45	3 1:45
Total chloride (1:5 extract)	134	3 1:45	3 1:45
Water soluble sulfate (1:5 extract)	134	3 1:45	3 1:45
pH and EC of the 1:5 extract	134	3 1:45	3 1:45
Total nitrogen, nitrate and Kjeldahl nitrogen	134	3 1:45	3 1:45
Total phosphorus	134	3 1:45	3 1:45
Calcium	114	3 1:38	3 1:38
Aluminium	62	0	0
Iron	114	3 1:38	3 1:38
Manganese	52	1:17	1:17
Magnesium	114	3 1:38	3 1:38
Indicators of Potential Acid Sulfate Soils pH_F, pH_{FOX}, acid base accounting (ABA) Reaction Ratings	426	11 1:39	13 1:33
Chromium reducible sulfur (CRS) suite	9	0	0

3.3 ADOPTED SCREENING CRITERIA

Noting the baseline nature of this assessment, comparison of analytical results against land use criteria was not required to meet the defined objective of general chemical characterisation.

In order to identify any ASS that could potentially be disturbed during construction and operation, an assessment of ASS indicators against published guideline criteria was undertaken.

The first step of the PASS assessment was screening of soils for PASS indicators. Screening methods, known as field tests, assess the acidification potential from the oxidation of soils. The PASS field screening tests involve the following:

- Soil samples are subjected to chemical oxidation with a strong oxidant (hydrogen peroxide) and the pH measured, this pH is recorded as the pH field oxidation (pH_{FOX}).
- The pH of the soils is also measured in a small amount of de-ionised (DI) water, this pH is recorded as pH field (pH_F).
- The reaction during the field oxidation test is ranked between 1 to 4 as follows:
    - 1. No reaction to slight
    - 2. Moderate reaction
    - 3. Strong reaction with persistent froth
    - 4. Extreme reaction.

The following criteria are used to interpret the field screening results:

- $pH_{FOX} \leq 3$
- $pH_F - pH_{FOX} = 3$ or more
- Strong to extreme reaction rating (values of 4 or above)

As per DWER (2015) *Identification and investigation of acid sulfate soils and acidic landscapes*, high PASS risk rating was assigned if the samples displayed all three criteria. Moderate PASS risk is assigned if two positive criteria are reported. Low PASS risk is assigned if one criterion is positive. Actual Acid Sulfate Soils were considered to be those with a pH_F of less than or equal to 4.5.

Samples for which a moderate or high PASS risk rating was reported (following the screening assessment) were submitted for the chromium reducible sulfur (CRS) analytical suite. Results were compared against the following criteria:

- DWER (2015) *Identification and investigation of acid sulfate soils and acidic landscapes* (Table 10, Texture-based ASS 'action criteria').
- WQA (2018) *National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual*, by Sullivan, L, Ward, N, Toppler, N and Lancaster, G., Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0. (Table 1.1 Action criteria based on the texture and volume of material disturbed).

The national guidance utilised DWER (2015) as a reference for the development of manual and thus the criteria presented in both are the same. In this report we reference WQA (2018) as it is the most recent document.

We note that for the identification of ASS, as per DWER (2015) and WQA (2018), although acid neutralising capacity (ANC) of soils is measured in the CRS analytical suite, it is not used in determining the net acidity of a soil in the initial identification of whether ASS is present. Once the presence of ASS is confirmed, and its disturbance is deemed unavoidable, studies to assess the availability of any ANC can be undertaken. It is also noted here that use of ANC in seawater at a

coastal environment also cannot be used as a means of managing acid generation from disturbed ASS[3].

[3] Simpson, S.L., Mosley, L., Batley, G.E. and Shand, P., 2018, *National Acid sulfate soils guidance: Guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management,* Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0.

4 RESULTS

4.1 SOIL DESCRIPTION

A description of the geology encountered across the Project area has been documented by CMW (2022) based on the observations from the August/September 2021 test pit, CPT and surface sampling (across the algal mats) soil investigations. The distribution of the interpreted geological units is presented as the base map for Figures 2-12 at the rear of this report. The geological units have been grouped into the two main geographical areas where they are encountered. Unit names in italics below are the geomorphological units where the geological unit is commonly encountered:

- Units occurring within the *Alluvial Outwash/Residual Surface* north of the low-lying hills present immediately south of the North-west Coastal Highway, extending north through the crystalliser and concentrator ponds to the southern margin of the *Inter- and Supra-tidal flats*.
- Coastal Units occurring north of the *Alluvial Outwash/Residual Surface* within the Playa (*Inter and Supra tidal flats*) and heading north towards the coastal dunes and including the sand islands (*Fringing Dunes and Deflated Dunes, Sand Plains and Sandy Islands*) interspersed within the *Inter- and Supra-tidal Flats* and areas of *Mangrove* and associated mangrove muds both along the coastline and within tidal creeks.

Geological units within the Alluvial Outwash/Residual Surface are described as:

- Alluvial sheetwash – surface deposits of predominantly sand with gravel or gravelly sand with cobbles.
- Residual soil – located at the surface throughout the *Alluvial Outwash/ Residual Surface* area and beneath the thin veneer of Alluvial Outwash described above. Main soil types include sandy clay and clay with sand.
- Alluvium – potential alluvium deposits were encountered within the *Alluvial Outwash/ Residual Surface* are generally associated with (in the vicinity of) existing creek beds and are considered to represent former channel courses (paleochannels). Main soil types included sandy clay and sandy gravel.
- Granite (Extremely Weathered) - this unit was encountered directly beneath the Residual Soil and although the parent rock has been weathered to such an extent that it is a soil, the mass structure, texture and fabric of the parent rock can be observed. The predominant soil types comprised coarse through to fine grained clay-sand-gravel mixtures.
- Dolerite (Extremely Weathered) - this unit was encountered directly beneath the Residual Soil. Weathering has produced a similar range of clay-sand-gravel mixtures as the Granite formation.
- Granite (Moderately Weathered) - the Archaean-age Dampier Granitoid Complex is present under most of the site and is exposed in outcrops as follows:
    - In the banks of incised creek bed channels and particularly towards the mouth of the creeks where they discharge into the Playa (Inter- and Supra-tidal flats).
    - At the southern margins of the Playa (Inter and Supra-tidal flats) sometimes as a coastal wave cut platform (shoreline surface).
    - As low relief, shallow outcrops across the Alluvial Outwash/Residual Soil surface area
- Metasediment (Highly to Moderately Weathered) - encountered along the western edge of the crystalliser ponds area close to the western boundary of the study area. The material was

encountered below Residual Soil typically from around 1.00 to 1.50 m depth and recovered from the pit as a sandy gravel.

Coastal Units

- Eolian Sand - these occur immediate north and north-east of the Intertidal and Supra-tidal Flats along the coast behind the beach areas. The material typically comprises orange silty sand.
- Residual Soil - description as above, encountered beneath the Eolian Sand at the southern edge of the Sand Plains. The material comprised sandy clay or clayey sand.
- Granite (Extremely Weathered) - description as above, encountered beneath the Eolian Sand at the southern edge of the *Sand Plains* adjoining the northern margin of the *Inter- and Supra-tidal Flats*.
- Dolerite (Extremely Weathered) - description as above, encountered beneath the Eolian Sand at the southern edge of the *Sand Plains* adjoining the northern margin of the *Alluvial Outwash/Residual Surface* and in the east of the sandy islands.
- Calcarenite (Extremely Weathered) - encountered beneath the Residual Soil beneath the majority of the *Deflated Dunes* and *Sand Plains* extending north from the margins of the *Alluvial Outwash/Residual Surface* and below the *Fringing Dunes*. The unit typically comprised sandy gravel and clayey gravelly sand.
- Calcarenite (Highly to Moderately Weathered) - encountered in the following geological settings:
    - Former coastal rock ledges exposed at the margins of the sandy islands and along the southern margin of the *Inter- and Supra-tidal Flats*.
    - Occasional cemented dune sands i.e., calcarenites exposed immediately to the south of the *Fringing Dunes* or around the edges of sand islands.
- Lagoonal Muds (Sediments) - soft sediments encountered in the Inter- and Supra-tidal Flats. These sediments occurred within the following geological settings:
    - Inter-tidal flats and creeks.
    - Within area of scattered mangrove
    - Within area of Supra-tidal flats
- The lagoonal muds comprised Inter-laminated layers of clay, silt, sand and sandy clay (very soft to stiff) and clayey sand and sandy clay.

It is noted that some of the soil investigation locations completed by LWC/Leichhardt were outside of the mapped geology overlay prepared by CMW. The surficial soils encountered at these locations are described further in Section 4.5.

Soil bores logs for the samples collected by CMW are not presented here, however, details from these logs which describe the samples collected are included in the tables at the rear of this report.

4.2 ANALYTICAL RESULTS

Soils and sediments were assessed for the following suite:

Acid sulfate soil parameters: field testing (pH_F and pH_{FOX}) followed by CRS suite where appropriate.

General soil suite comprising:

- Particle size distribution (PSD) analysis (laser diffraction method)
- Total organic carbon (TOC)
- Total nitrogen (TN), nitrate and Kjeldahl nitrogen
- Total phosphorus (TP)
- Cation exchange capacity (CEC)
- Total chloride (1:5 extract)
- Water soluble sulfate (1:5 extract)
- pH and Electrical Conductivity (EC) of the 1:5 extract
- Metals iron (Fe), manganese (Mn), calcium (Ca), magnesium (Mg), sodium (Na) and potassium (K)
- Exchangeable cations Ca, Mg, Na and K

Analytical results are presented at the rear of the report as follows:

- Table 1 - Summary of Analytical Results - P1 - Test Pit Samples
- Table 2 - Summary of Analytical Results - P1 - Surface Samples from Beneath Algal Mats
- Table 3 - Summary of Analytical Results - P2 - Surface Samples
- Table 4 - Summary of Analytical Results - Potential Acid Sulfate Soil Screening
- Table 5 - Summary of Analytical Results - Chromium Reducible Sulfur
- Table 6 - Summary of Analytical Results - Particle Size Distribution

Certified laboratory analytical reports are presented in Appendix A.

A series of plots have been developed to display the spatial variability of each analyte measured. Concentration bubble plots have been generated for each chemical substance or parameter (i.e. pH) with sufficient data points above the limit of reporting. Creek systems and geological descriptions (as per CMW, 2022) were also overlaid on these plots to allow for a visual assessment of potential patterns/ relationships across the Project Area to these features. Note that where multiple samples were collected per location, the most surficial result is used for the mapping. These figures are presented as Figure 3 to 10.

In addition to the above, bubble plots of total nitrogen (TN) and total organic carbon (TOC) concentrations were also generated to overlay the interpreted algal mat activity zones (as interpreted by Leichhardt with the shapefile provided to LWC).

4.2.1 ACID SULFATE SOIL ASSESSMENT

A screening assessment was undertaken based on the reported field testing inclusive of the pH_F, pH_{FOX} and the pH_{FOX} reaction ratings, the full analytical results are detailed in Table 4 (at the rear of this report), with a summary provided in Table 4-1.

Table 4-1 details the number of samples that reported a low, moderate or high-risk rating or were considered to be PASS or AASS. Note that only samples collected during August, September and December 2021 were submitted for ASS screening analysis.

Table 4-1 Summary of PASS Risk Ratings and ASS

Sampling method	pH_F	pH_{FOX}	Reaction Ratings
Total number of screened samples	437	437	437
Minimum	7	3.1	Moderate
Maximum	13	12	Extreme
Average	9.2	9.0	N/A
Summary of Risk Ratings			
Number of Low Risk Ratings (i.e. one or none of the risk criteria were met)	436		
Number of Moderate Risk Ratings	1 (sample CPT052 at a depth of 0.7 m)		
Number of High Risk Ratings	0		
Number of AASS ($pH_F \leq 4.5$)	0		

The most significant difference between pH_F to pH_{FOX} are noted near the coastal area as shown in Figure 11 and 12.

The pH_F of surface soils in the alluvial outwash area and the coastal units were typically alkaline, the alluvial outwash was less alkaline than the tidal zones. This is likely due to the water source and the volume of water in each area. In the alluvial outwash/residual soil areas the water evaporating is likely to be mostly rainwater. This water will dissolve *in situ* soluble salts (potentially from previous evaporation events) which will lead to brackish water within the vadose zone and possibly at surface. This water may also percolate through the soils to the groundwater table. Any water remaining at the surface will evaporate. The water balance will drive the pH; for example, in standing water conditions where the water is fresh, higher pH values may be generated (Garrels and Mackenzie 1967). However, in the case where the water evaporating is of a higher salinity to start, the end pH from evaporation may be lower due to the role dissolved solutes play in buffering down the pH (e.g. Hardie and Eugster 1970). The chemistry of the soil matrix (excluding evaporites) does not play a large role in the pH in these examples.

The pH_{FOX} results were, for most samples, very similar to the pH_F results. This indicates that there is little within the samples that can oxidise to generate sufficient acid to lower the pH of the soil. The exceptions were the sediments collected via CPT within the intertidal zone. These soft sediments also exhibited an extreme reaction rating, with difference of around 2 or more pH units when oxidised (difference between pH_F and pH_{FOX}) and were in an environmental setting where ASS was likely, as described in the soils desk study (LWC 2021).

The soils of alluvial origin and those described as residual soils derived from weathering of igneous lithologies, did not present any field screening result indicative of ASS. The surface soils were highly oxidised and alkaline.

Based on these results, a total of nine (9) samples were selected for further ASS assessment via CRS suite.

Results in comparison to the WQA (2018) criteria for the relevant soil type are presented in full in Table 5 (at the rear of this report) and are summarised in Table 4-2.

Table 4-2 Summary of Chromium Reducible Sulfur Suite Analytical Results

Sample	Soil Type	Location within the Project Area/ Mapped Geology	Interpretation of Results
CPT037 – depth of 1.6 m	Silty sand and sandy silt	Central northern boundary of the Development Envelope near the Coast Lagoonal Mud coverage	The WQA (2018) criteria are exceeded. This sample is PASS.
CPT040 – depth of 0.9 m	Sediment fine-grained	Central northern boundary of the Development Envelope near the Coast Mangrove Mud coverage	The WQA (2018) criteria are exceeded. This is sample is PASS.
CPT047 – depth of 2.4 m	Clay	Central northern portion of the Project Area near the outlet of McKay Creek Mangrove Mud coverage	The WQA (2018) criteria are exceeded. This sample is PASS.
CPT047 – depth of 1.8 m	Organic soil	Central northern portion of the Project Area downgradient of the outlet of McKay Creek Mangrove Mud coverage	The WQA (2018) criteria are exceeded. This sample is PASS.
CPT049 – depth of 2 m	Clay	Central northern portion of the Project Area downgradient of the outlet of McKay Creek Mangrove Mud coverage	Reported concentrations did not exceed the WQA (2018) criteria. This samples is not ASS.
CPT052 - depth of 0.7 m	Organic soil	Central northern boundary of the Development Envelope Mangrove Mud coverage	The WQA (2018) criteria are exceeded. This sample is PASS.
CPT055 – depth of 1.7 m	Organic soil	Central northern boundary of the Development Envelope Mangrove Mud coverage	The WQA (2018) criteria are exceeded. This sample is PASS.
CPT057 – depth of 1.6 m	Clay	Central northern boundary of the Development Envelope Mangrove Mud coverage	The WQA (2018) criteria are exceeded. This sample is PASS.
CPT058 – depth of 1.4 m	Clay & silty clay	Central northern boundary of the Development Envelope	The WQA (2018) criteria are exceeded. This sample is PASS.

Sample	Soil Type	Location within the Project Area/ Mapped Geology	Interpretation of Results
		Mangrove Mud coverage	

The results of these tests demonstrate that the intertidal zone lagoonal muds and mangrove muds contain sulfides and therefore are interpreted as being PASS. The shallowest depth at which sulfides were found was at 0.9 m below current ground surface at CPT040. This sample was described as fine gained sediment. All samples assessed by the CRS suite method were fine grained, with all samples reporting 75-100 % of the sample to be within the <2mm size fraction.

Actual ASS (AASS) was not recorded in any sample assessed.

4.2.2 GENERAL SOIL PARAMETERS - EXTRACTS

4.2.2.1 pH and ELECTRICAL CONDUCTIVITY

The table below provides a summary of the pH and electrical conductivity (EC) results reported across the Project Area.

Table 4-3 Summary of pH and electrical conductivity results

Parameter	pH (1:5 Aqueous extract) (pH units)	Electrical Conductivity (µS/cm)
Number of Samples Analysed	134.0	134.0
Number of Detections	134.0	133.0
Minimum Value Detected	6.9	20.0
Maximum Value Detected	9.9	25000.0
Median Value Detected	8.6	3500.0
Mean Value Detected	8.5	5699.7
Standard Deviation of Detected Values	0.5	6125.6
Comment	Reported pH across the Site indicates that the soil profile is generally more alkaline than acidic. Only two samples reported pH less than 7 (SS/MBH06 and SS208 both reported pH of 6.9) and both were in close proximity to surface water features. With reference to Figure 10, in general, slightly lower pH (but still	With reference to Figure 7, reported EC was observed to be highest near the coast, within the algal mat areas and within the Lagoonal Muds/ Eolian Sand coverage. As demonstrated on the bubble plots, EC throughout this area predominantly ranged from 7,500 to 25,000. The highest reported concentrations were:

Parameter	pH (1:5 Aqueous extract) (pH units)	Electrical Conductivity (µS/cm)
	alkaline) were reported nearer the coastline. Further discussion of pH is detailed in Section 4.3.	▪ SSA058_0-50 located within the central northern portion of the Project Area within the Lagoonal Muds coverage – 25,000 µS/cm It is noted that the underlying sample SSA058_100-150 reported a lower EC of 4500 µS/cm ▪ SSA065_100 also located within the central northern portion of the Project Area within the Lagoonal Muds coverage - 18,000 µS/cm For the remainder of the project area (i.e. not within or adjacent the mapped algal mat areas), EC was generally less than 3,500 µS/cm with the majority of samples reporting EC less than 1,000 µS/cm.

4.2.2.2 SULFATE AND CHLORIDE

The table below provides a summary of the sulfate and chloride results reported across the Project Area.

Table 4-4 Summary of sulfate and chloride results

Parameter	Sulfate (mg/kg as SO_4)	Chloride (mg/kg)
Number of Samples Analysed	134.0	134.0
Number of Detections	95.0	108.0
Minimum Detected Concentration	10.0	9.4
Maximum Detected Concentration	11000.0	50000.0
Median Detected Concentration	1600.0	7850.0
Mean Detected Concentration	2221.4	13584.7
Standard Deviation of Detected Concentrations	2427.1	14491.6

Parameter	Sulfate (mg/kg as SO_4)	Chloride (mg/kg)
Comment	Around 30% of the samples submitted for analysis reported concentrations of sulfate below laboratory detection limits. With reference to Figure 9, similar to EC, reported sulfate was observed to be highest near the coast, within the algal mat areas and within the Lagoonal Muds/ Eolian Sand coverage. The highest reported concentrations were as follows: ▪ SS/SW12 located at the surface within the water course near surface water sample location SW12, within the western portion of the Project Area in the Alluvial Soils coverage near the edge of the algal mat area – 11,000 mg/kg ▪ SSA071_100 located in the north eastern portion of the project area near the coast - 11,000 mg/kg ▪ SSA072_50 located near SSA071 – 10,000 mg/kg Whilst there is no mapped geological coverage for the area targeted by SSA071 and SSA-07 it is likely that these were collected from Lagoonal Mud/ Eolian Sand. For the remainder of the Site (i.e. not within/ adjacent the coastal algal mat area), concentrations of sulfate were generally less than 500 mg/kg.	20% of samples reported chloride below laboratory detection limits. Chloride concentrations generally correlate with sulfate and EC distribution in the soils. Highest concentrations are within the algal mat areas and within the Lagoonal Muds/ Eolian Sand coverage. The highest concentration of 50 000 mg/kg was reported in sample location SSA57 and SSA84.

Chloride:sulfate ratio (by mass) in soil water extracts can be used in concert with ASS field screening results to provide an indication of the presence of acid sulfate soils (DWER 2015). Thus, this ratio was calculated for all samples where chloride and sulfate contents were above the limit of reporting.

Chloride:sulfate in seawater is typically around 7, and thus a decrease from this value indicates an additional source of sulfate. Ratios of chloride and sulfate in evaporites will typically not be the same as the solution they precipitated from, however, DWER (2015) recommend that if a decrease in the ratio is is combined with a positive field test result such as a strong reaction with peroxide and a drop in pH, the additional sulfate present could be from the oxidation of sulfides within the soil (DWER 2015).

Chloride:sulfate at Eramurra ranged from 0.06 to 107.7. Values <7 were recorded in 40 out of the 95 samples where a ratio could be calculated.

Ratios can be grouped:

- Test pit surface clays/sandy clay chloride:sulfate ranged from 0.06 to 3.8,
- Surface sediments – sandy clays/clayey sands and sands chloride:sulfate were generally between 4.85-24.62.
- Surface sediments – silts chloride:sulfate ranged from 30.23-107.7

The test pit clays and sandy clays did not record a risk of ASS in the field screening with the only positive indicator being the reaction rating where effervescence was noted. This is interpreted as being caused by carbonates and organic matter reacting with the peroxide solution, not a reaction with sulfides. The low chloride:sulfate is caused by the low concentration of chloride in the soils, which would be expected in an environment where rainwater was the primary water source. The sulfate in these soils may be residual gypsum which has a lower solubility than any chlorides, the gypsum forms a crust on the surface of the soils preventing erosion. The gypsum likely forms from evaporation of rainwater and surface water flows rather than from oxidation and neutralisation reactions of sulfides.

Surface sediments sandy clays/clayey sands and sands were the units where PASS was identified, the low ratios in these soils may therefore be an additional indication of PASS, however the pH of all extracts was above 6.9, therefore it is unlikely that the insitu sulfide has oxidised. If any oxidation has occurred, the neutral pH measured is evidence that there is sufficient buffering capacity present to manage this acid source or that the acid has been removed from the system (tidal flushing). Further, it is also possible that a portion of the sulfate in these sediments is sourced from the gypsum present in the alluvial outwash and residual soils surface.

The very high ratios measured in the surface sediment silts are likely due to evaporation an area which is not regularly flushed with water which has led to relatively elevated chloride values. This is typical of an area where the chloride is derived from freshwater and cyclical wetting and drying events occur; the chloride concentrates in the brine as minerals containing the other major ions such as sodium precipitate (e.g. Eugster and Hardie 1978). Once the system reaches dryness there is an excess of chloride in the evaporites.

4.2.3 GENERAL SOIL PARAMETERS - NUTRIENTS

4.2.3.1 NITROGEN

The table below provides a summary of the TN, nitrate and nitrite and Kjeldahl nitrogen concentrations reported across the Project Area.

Table 4-5 Total nitrogen, nitrate, nitrite and Kjeldahl nitrogen results

Parameter	Total Nitrogen as N (mg/kg)	Nitrate and Nitrite as N (mg/kg)	Kjeldahl Nitrogen as N (mg/kg)
Number of Samples Analysed	134.0	134.0	134.0
Number of Detections	131.0	56.0	131.0
Minimum Detected Concentration	13.0	1.1	13.0

Parameter	Total Nitrogen as N (mg/kg)	Nitrate and Nitrite as N (mg/kg)	Kjeldahl Nitrogen as N (mg/kg)
Maximum Detected Concentration	1100.0	39.0	1100.0
Median Detected Concentration	220.0	4.6	220.0
Mean Detected Concentration	280.2	7.5	280.2
Standard Deviation of Detected Concentrations	227.3	7.9	227.3
Comment	With reference to Figure 3 and Figure 4, concentrations of TN were variable across the Project Area and across areas of differing algal activity. The highest reported concentrations were as follows: ▪ SS/SW12 located at the surface within the water course near surface water sample location SW12, within the western portion of the Project Area in the Alluvial Soils coverage near the edge of the algal mat area – 1,100 mg/kg ▪ TP58_0 located at the surface in the western portion of the Project Area within the Alluvial Soils coverage – 1,039 mg/kg ▪ SSA001_50-100 located in the central northern portion of the Project Area within the Lagoonal Muds/	Concentrations of the sum of nitrate and nitrite were generally below 5 mg/kg, with 60% of samples reporting concentrations below the limits of laboratory detection. The highest reported concentration of 39 mg/kg was in TP058 at surface (0-0.5m).	Based on the data presented in this table the majority of nitrogen in the soils is Kjeldahl nitrogen which is associated with organic nitrogen. The concentrations of Kjeldahl nitrogen therefore directly correlate to TN concentrations and distribution.

Parameter	Total Nitrogen as N (mg/kg)	Nitrate and Nitrite as N (mg/kg)	Kjeldahl Nitrogen as N (mg/kg)
	Limited Algal Activity coverage – 950 mg/kg		

4.2.3.2 TOTAL ORGANIC CARBON, TOTAL PHOSPHORUS

The table below provides a summary of the TOC and TP concentrations reported across the Project Area.

Table 4-6 Summary of Total Organic Carbon and Total Phosphorus Results (mg/kg)

Parameter	Total Organic Carbon (mg/kg)	Total Phosphorus (mg/kg)
Number of Samples Analysed	134.0	134.0
Number of Detections	123.0	126.0
Minimum Detected Concentration	0.1	9.3
Maximum Detected Concentration	10.0	1900.0
Median Detected Concentration	0.5	155.0
Mean Detected Concentration	0.9	179.5
Standard Deviation of Detected Concentrations	1.2	184.1
Comment	With reference to Figure 5 and Figure 6, concentrations of TOC were variable across the Project Area and across areas of differing algal activity. The highest reported concentrations were as follows: ▪ SSA200_50 located at the outlet of Eramurra Creek in the western portion of the Project Area (no geological coverage) – 10 %	The maximum concentration of phosphorus measured appears to be anomalously high as it is double the concentration of the next highest value 660 mg/kg. The presence of phosphorus correlates to organic matter (TOC) where concentrations of TOC are greater than 3 times the laboratory detection level of 0.1%

Parameter	Total Organic Carbon (mg/kg)	Total Phosphorus (mg/kg)
	▪ TP151_0 located at the surface in the central portion of the Site within the Residual Soil coverage – 5.6 % ▪ SSA15_100-150 located within the north eastern portion of the Site (no geological coverage) – 4.2 % ▪ SSA058_100-150 located within the central northern portion of the Project Area within the Lagoonal Muds coverage - 4% It is noted that the overlying sample (SSA058_0-50 reported TOC of only 0.9%)	

4.2.4 GENERAL SOIL PARAMETERS - CATION EXCHANGE CAPACITY AND EXCHANGEABLE CATIONS

Table 4-7 provides a summary of the cation exchange capacity (CEC) and exchangeable cation concentrations reported across the Project Area.

Table 4-7 Summary of CEC and Exchangeable Cation Results

Parameter	Cation Exchange Capacity (meq/100g)	Exchangeable cations (meq/100g)			
		Ca	Mg	K	Na
Number of Samples Analysed	134.0	52.0	52.0	52.0	52.0
Number of Detections	134.0	52.0	52.0	47.0	28.0
Minimum Detected Value	3.0	1.7	0.6	0.2	0.2
Maximum Detected Value	190.0	34.0	47.0	4.4	64.0
Median Detected Value	34.0	18.0	3.3	0.7	1.2

Parameter	Cation Exchange Capacity (meq/100g)	Exchangeable cations (meq/100g)			
		Ca	Mg	K	Na
Mean Detected Value	36.2	16.9	5.4	1.0	9.0
Standard Deviation of Detected Value	23.6	9.2	8.0	0.9	16.2
Comment	With reference to Figure 8, Reported CEC was observed to be variable across the project area. The highest reported CEC was reported at: ▪ SSA071_100 located in the north-eastern portion of the project area near the coast–190 meq/100g ▪ SSA072_50 located near SSA071–130 meq/100g Whilst there is no mapped geological coverage for this area, it is likely that these were collected from Lagoonal Mud/ Eolian Sand. The cation exchanging in these soils and sediments is predominantly Ca given the higher median concentration. However, it is noted that similar maximum concentrations were reported for Ca, Mg and Na. Thus, other cations are contributing to CEC at the site. The data is too sparse at present to make a definitive association however, the higher CEC was always found in the silty clay soils (where soil type was recorded).				

4.2.5 GENERAL SOIL PARAMETERS - PARTICLE SIZE DISTRIBUTION

Particle size distribution analysis was undertaken across the project area as detailed in Table 6 at the end of this report and summarised in Table 4-8 below. These data were collected to 1. Allow for comparison of material type to chemical parameter concentrations and 2. To assist with the hydrogeological conceptualisation of the site and seepage assessment given the relationship of grain size and the hydraulic conductivity of soils and sediments.

The full laboratory results are presented in Appendix B.

Table 4-8 Summary of Particle Size Distribution Results (Surface Soils)

Sample	Location in the Project Area	Mapped Geology	Interpreted Predominant Soil Type
SS/MBH001	Adjacent west of pipeline	Residual Soil	Clayey Sandy Silt with minor gravels

Sample	Location in the Project Area	Mapped Geology	Interpreted Predominant Soil Type
SS/MBH003	Northern portion of Project Area near coast	Eolian sand	Silty Sand with clay fines
SS/MBH008	Northern central portion of Project Area along coast	Eolian Sand	Sand with clay and silt fines
SS/MBH017	Adjacent east of pipeline	No mapped geology	Sandy Clayey Silt with minor gravels
SS/MBH019	Eastern portion of Project Area near algal mats	No mapped geology	Clayey Silty Sand with gravels
SS/MBH020	Eastern boundary of Development Envelope	No mapped geology	Clayey Sandy Silt with minor gravels
SS/MBH06	Central portion of Project Area	Alluvial Soils (this veneer of sheetwash gravels over residual soil)	Silty Sandy Clay with minor gravels
SS/SW03	Southern portion of Project Area within McKay Creek	No mapped geology	Gravelly Sand with trace clay and silt fines
SS/SW04	Within McKay Creek	Predominantly granitoid rocks	Gravelly Sand with silt and clay fines
SS/SW05	Within McKay Creek	Predominantly granitoid rocks	Gravelly Sand with trace silt and clay fines
SS/SW07	Tributary of McKay Creek in south central portion of Project Area	No mapped geology but expected to be Predominantly granitoid rocks	Gravelly Sand with trace silt and clay fines
SS/SW08	Tributary of McKay Creek in south central portion of Project Area	No mapped geology but expected to be Residual Soil	Silty Sand with gravels and clay fines
SS/SW09	Devil Creek upgradient of Development Envelope	No mapped geology	Gravelly Sand with trace silt and clay fines
SS/SW12	Western portion of the Project Area in creek line/ near Algal May area	Alluvial Soils (braided channel)	Clayey Silt with minor sand and gravels
SS101	Western portion of Project Area	No mapped geology	Sandy Silt with clay fines
SS102	Western portion of Project Area	No mapped geology	Sandy Silt with clay fines and minor gravels

Sample	Location in the Project Area	Mapped Geology	Interpreted Predominant Soil Type
SS103	Western portion of Project Area	No mapped geology	Silty Sand with gravels and clay fines
SS104	Western portion of Project Area	No mapped geology	Silty Sand with gravels and clay fines
SS105	Western portion of Project Area	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel
SS106	Western portion of Project Area within Eramurra Creek	No mapped geology	Sandy Silt with gravels and clay fines
SS107	Western portion of Project Area	Residual Soil	Clayey Silt/ Silty Clay with sand and gravel
SS108	Western portion of Project Area	Alluvial Soils (braided channel)	Gravelly Silt with clay fines and minor sand
SS109	Western portion of Project Area	Residual Soil	Clayey Silt/ Silty Clay with sand and gravel
SS110	Western boundary of Development Envelope	Residual Soil	Clayey Silt/ Silty Clay with sand and gravel
SS111	South-western boundary of development envelope	No mapped geology Expected to be residual soil	Clayey Silt/ Silty Clay with sand and gravel
SS112	Western portion of Project Area within Eramurra Creek	No mapped geology	Silty Sand with clay fines and minor gravels
SS113	South-eastern portion of Project Area	Residual Soil	Clayey Silt/ Silty Clay with sand and gravel
SS114	Within McKay Creek	No mapped geology	Silty Sand with gravels and clay fines
SS115	South-western portion of Project Area	No mapped geology	Silty Sand with gravels and clay fines
SS116	Central portion of Project Area	Alluvial Soil (thin veneer of sheetwash gravel over residual soils	Silty Sand with gravels and clay fines
SS117	Southern boundary of Development Envelope	No mapped geology	Silty Sand with gravels and clay fines
SS118	Southern boundary of Development Envelope	No mapped geology	Sandy Silt with gravels and clay fines

Sample	Location in the Project Area	Mapped Geology	Interpreted Predominant Soil Type
SS119	Western portion of Project Area adjacent creek bed	Alluvial Soils	Sand with clay and silt fines and gravels
SS120	Central portion of Project Area	Predominantly granitoid rocks	Silty Sand with gravels and clay fines
SS121	Central portion of Project Area	Predominantly granitoid rocks near Residual Soil	Gravelly Sand with clay and silt fines
SS201	Adjacent east of pipeline	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel
SS202	Adjacent east of pipeline	No mapped geology	Silty Clay with sand and gravel
SS203	Adjacent east of pipeline	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel
SS204	Eastern portion of Project Area near coast	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel
SS205	Eastern portion of Project Area	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel
SS206	Eastern portion of Project Area near Devil Creek	No mapped geology	Silty Sand with gravels and clay fines
SS207	Eastern boundary of Development Envelope	No mapped geology	Sandy Silt with gravels and clay fines
SS208	Eastern boundary of Development Envelope	No mapped geology	Sandy Gravel with clay and silt fines
SS209	East of pipeline	No mapped geology	Silty Clay with sand and gravel
SS210	Eastern portion of Project Area near Devil Creek	No mapped geology	Clayey Silt/ Silty Clay with sand and minor gravel
SS211	South-eastern corner of development envelope, adjacent east of pipeline	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel
SS212	South-eastern corner of development envelope, adjacent east of pipeline	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel
SS213	Within Devil Creek	No mapped geology	Sandy Silt with clay fines and gravels
SS214	Eastern portion of Project Area	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel

Sample	Location in the Project Area	Mapped Geology	Interpreted Predominant Soil Type
SS215	Adjacent east of pipeline	No mapped geology	Clayey Silt/ Silty Clay with sand and gravel
SS216	Adjacent west of pipeline	Residual Soils	Clayey Silt/ Silty Clay with sand and gravel
SS217	Eastern portion of Project Area near coast	No mapped geology but expected to be Lagoonal Mud or Eolian Sand	Clayey Silt/ Silty Clay with sand and gravel

4.3 OTHER ATTRIBUTES

Surface soils and sediments were also assessed for their Al, Fe and Mn content. The highest Fe content (65 000 mg/kg) was reported in the alluvial soils in the central portion of the site (MBH006). This did not correlate with other attributes of the sample such as Mn or EC, and thus it is likely that the distribution of Fe relates to the source rock of the alluvial material rather than any insitu weathering process or to surface water quality.

For Mn, the highest concentrations (maximum 2300 mg/kg) were reported in the surface sediments of the coastal units. This is unsurprising given the common association of Mn with estuarine and coastal sediments.

Aluminium, Al highest concentrations are found in the clay materials, particularly those in the coastal units. Clays are aluminium silicates, and thus the association with Al is expected.

4.4 SUB SURFACE SOILS ASSESSMENT

Twenty-two (22) sub surface soils were collected during the groundwater monitoring well drilling program completed by LWC in December 2021. The soils were submitted to Microanalysis for assessment of their crystalline mineral content via x-ray diffraction (XRD) to assist with the geological description of these materials. Samples were collected above and below the water table with samples also collected within the screened interval of installed wells. Location denoted MBH were drill locations where water was not encountered, those denoted MW are the sampled locations where a well was installed. Locations are in numerical order irrespective of whether they are MW or MBH.

These data are included here to assist in understanding the variability of the sub-surface soil profile. Generally, the sub-surface soils consist of a highly weathered residual soil. The majority of the samples consisted of clays kaolinite, palygorskite, illite and montmorillonite indicating the weathered nature of the materials sampled. The primary minerals remaining from the parent rock were silicates: quartz, feldspars (albite and microcline), amphibole, muscovite and chlorite (clinochlore), carbonates (dolomite and calcite) and iron oxides (hematite) with occasional sulfates (gypsum). Sulfides were not reported. The results are tabulated below. The mineralogy is consistent with the geological description: residual soil.

The water table could not be distinguished based on the mineralogy, despite there being a distinct colour change from brown to cream or pale green at times. This colour change is likely due to leaching of iron from the surface of the minerals present, a process that can occur without altering the mineral crystal form.

The mineralogy and the weathered nature of the materials sampled suggests that no significant risk of acid formation from the sub-surface materials is present. Clays will produce acidic pH (pH below 5) when in contact with water through the release of hydrogen ions from clay hydrolysis. This is considered to be the natural background soil pH in the sub-surface of the majority of the site.

The certified laboratory analytical results are presented in Appendix B.

Table 4-9 Summary of Semi-Quantitative XRD Results (as wt. %)

	Depth (m)	Albite	Microcline	Quartz	Clinochlore	Phlogopite	Muscovite	Montmorillonite	Calcite	Kaolinite	Gypsum	Hematite	Stilpnomelane	Palygorskite	Goethite	Amphibole	Dolomite	Halite	Sepiolite	Illite
MW001	2	11	8	40	5				15		2			2	1	10				
MW001	6		10	33				10	39								8			
MW001	10		12	50				19		13					5					
MW005	2.1	6	8	39				38		9										
MW005	3		3	19	6			9	12	25				28						
MW005	7		7	26	12			22	6	24		3								
MW005	12	6	9	60				6		18										
MBH006	7-10		9	39				25	20	7										
MBH007	5-7	17	52	15			9			7										
MBH007	20-20.5	32	18	9	25			3				trace				9		1		1
MBH009	2-5.5	4		4					22					12			57			
MBH010	3-6		14	6					21					28			31		1	

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	Depth (m)	Albite	Microcline	Quartz	Clinochlore	Phlogopite	Muscovite	Montmorillonite	Calcite	Kaolinite	Gypsum	Hematite	Stilpnomelane	Palygorskite	Goethite	Amphibole	Dolomite	Halite	Sepiolite	Illite
MBH011	3-5	7	17	27	12		3		21	4							9			
MW012	1	46	25	15	6		7													
MW012	3	50	23	15	7		5													
MW012	4	37	17	23	19		4													
MW012	5	36	39	17	6	1														
MW012	5.5	55	21	14	8	2														
MW012	7	29	26	26	8		10													
MW012	7.5	46	34	14	3		3													
MW012	20	40	28	15	6		10													
MW013	2	14	16	34				14	7	5	4	1	3	1						
MW013	7.5	4	8	13				46	17	10	2									
MW013	9.5		6	33				48	8	4		1								
MBH015	1-3.5	5	18	23					54											
MBH015	8-10.5		26	28			18	9	6	10								3		

	Depth (m)	Albite	Microcline	Quartz	Clinochlore	Phlogopite	Muscovite	Montmorillonite	Calcite	Kaolinite	Gypsum	Hematite	Stilpnomelane	Palygorskite	Goethite	Amphibole	Dolomite	Halite	Sepiolite	Illite
MBH015	4-8	2	16	33			20	15	5	8								1		
MBH017	12.5-18		18	24			22	6		22	8									
MBH017	5.5-10.5		20	23			9	19	25	4										
MBH018	2-5	25		33	24		10							2		6				
MBH019	6-9		12	21			13	13	27	3							13			
MBH020	10.5-19	36	13	18	3		18	5	4					3						

4.5 DATA QUALITY ASSESSMENT

The quality of analytical data produced for this project has been assessed with reference to the following issues:

- Sampling technique;
- Preservation and storage of samples upon collection and during transport to the laboratory;
- Sample holding times;
- Analytical procedures;
- Laboratory limits of reporting;
- Field duplicate agreement;
- Laboratory quality assurance/quality control (QA/QC) procedures; and
- The occurrence of apparently unusual or anomalous results.

Laboratory QA/QC procedures and results are detailed in the certified laboratory results contained in Appendix A. A summary of the soil assessment for quality assurance and control is presented as Appendix C.

All samples were collected, stored and transported to the laboratory in accordance with the requirements of Schedule B (2) of the NEPM (NEPC 1999, as amended 2013). Laboratory analysis was undertaken in accordance with National Association of Testing Authorities (NATA) accepted analytical procedures and the requirements of Schedule B (3) of the NEPM (NEPC 1999, as amended 2013).

The quality control information is considered to indicate that an acceptable degree of QA/QC information was collected and reported providing confidence in the accuracy and precision of reported results subject to the limitations discussed in Appendix C.

5 CONCLUSIONS

Land and Water Consulting (LWC) was engaged by Leichhardt Salt Pty Ltd (Leichhardt) to undertake soil and sediment testing to inform the Baseline Soil and Sediment Assessment for the Eramurra Salt Project located on the Pilbara Coast, Western Australia (the Site).

The objective of this assessment was to complete baseline soil and sediment testing as per the draft Environmental Scoping Document (ESD) for the Eramurra Salt Project (the Proposal) and subsequent draft EPA/ DMIRS response comments, specifically:

- #80 - Undertake a baseline soil assessment of the proposed Pond and Infrastructure Development Envelope including physical (i.e. particle size) and chemical (metals, hydrocarbons) characteristics.
- #82 - Undertake a study to identify any ASS that could potentially be disturbed by the Proposal and if required, prepare an ASS Management Plan to prevent contamination of the terrestrial environment.

Key findings of the soils and sediment baseline assessment included the following:

- The purpose of this assessment was to establish baseline soil conditions beneath/ surrounding the Project Area i.e., as opposed to the assessment of risk to environmental values. The reported concentrations of chemical substances in these soils and sediments will likely be used, in future, to establish site specific trigger levels which would then be utilised for interpretation of risk to the identified environmental values.
- The coastal units also reported the highest Al, Mn and Ca, Na, K and Mg content (based on total and exchangeable concentrations).
- The nutrient levels within soils are dominated by nitrogen, which is likely to be organic nitrogen not nitrate. Organic carbon levels in the soil are generally below 1% C in the open playa areas, with concentrations increasing to a maximum of 10% C in areas close to creeks and in the coastal units. Phosphate concentrations displayed the opposite trend where concentrations are higher in the playa and alluvial outwash areas and lower in the coastal units.
- Concentrations of phosphorus are likely retained on the clays within the residual soils, and it is possible phosphorus is utilised in the coastal areas by the algal mat community.
- Cation concentrations (Ca, Mg, K and Na) correlate well with EC and thus are likely present due to evaporation of surface water.
- Cation exchange capacities are higher in silty clays.
- The pH of surface soils in the Project Area are neutral to alkaline ranging from 6.9 – 13. The highest pH are recorded in the coastal units (pH_F SSA089) where evaporation is likely to be the greatest influence on pH.
- Sulfate and chloride concentrations generally correlate to soil EC, with the highest values reported in the coastal units.
- Chloride:sulfate ratios of the soils and sediments are variable. The highly dynamic evaporative areas towards the coast have relatively elevated chloride values leading to very high ratios, whereas the alluvial and residual soil plains have lower ratios due to the relatively low concentrations of chloride in these soils. Coastal sands and clays have low chloride:sulfate ratios which may, along with the results of ASS field screening, confirm the presence of sulfide in these soils.

- Acid sulfate soils are highly unlikely to be present in the majority of the Project area where alluvial outwash/residual soils are present. These weathered soils derived from igneous rocks contain a mineralogy consistent with the geological description. The dominant mineral phases are carbonates, silicates and oxides. Sulfides were not reported in these soils. Given these findings there is no requirement for further assessment of these soils in terms of acid sulfate soil potential.
- The soils and sediments in the coastal units are likely to be acid sulfate soil. Where these soils and sediments were sampled, testing has confirmed the presence of sulfides and the potential to generate acidic conditions should these soils or sediments be disturbed.
- These soils and sediments in the coastal zone are currently neutral and chloride:sulfate ratios indicate that they have yet to oxidise.
- Chemical analysis of soils and sediments has confirmed the findings of the soils desk-top study which identified the intra-tidal flats as the area most likely to host ASS.
- Construction activities in soils and sediments within the coastal units will require a more detailed ASS investigation to be completed. The purpose of this investigation will be to delineate the nature and extent of ASS materials to derive suitable management strategies for any unavoidable disturbance of these soils and sediments.
- Management of the acid generated from the disturbance of ASS in coastal environments requires addition of a neutralising agent, the natural acid buffering capacity from insitu carbonates in the sediments or alkalinity present in seawater cannot be relied upon (Simpson et al. 2018).
- The data quality assessment indicates that the chemical data is suitable to inform the baseline soils assessment for the Project. An acceptable degree of field and laboratory QA/QC was collected and reported, providing confidence in the accuracy and precision of all reported results.

Please refer to the statement of limitations associated with these works (presented as Appendix D).

6 REFERENCES

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Simpson, S.L., Mosley, L., Batley, G.E. and Shand, P., (2018), National acid sulfate soils guidance: guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management, Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0.

FIGURES

Bitterns, Dredging and Seawater Intake Options

Seawater Intake Option (Stage 2)

Gnoorea

Pond Development Area (Stage 2)

40 Mile Beach Access Rd

Devil Creek

Seawater Intake Option

Seawater and Bitterns Delivery Options

McKay Creek

Pond Development Area

Renewables

Mardie

Access Corridor

Infrastructure, Bitterns and Spoil Options

Process Plant

North West Coastal Hwy

Eramurra Creek

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads
- Devil Creek Gas Plant
- Devil Creek Village

Pond Type

- Crystal
- Evaporation
- Recovery



0 550 1,100 2,200 3,300 4,400

Metres

LWC Land & Water Consulting

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N

Project:
Eramurra Salt Project
Surface Water Sampling

Figure Title:
Site Locality Plan

Date: June 2022

Projection: GDA94 Z50

Scale: See Plan

Figure in Set: 1 of 12

Site Address:
Mardie, Western Australia

Figure 1 Revision A

Drawing Reference AAAA

Legend

- Development Envelope
- Roads
- Water Courses
- Gas Pipeline

Pond Type

- Crystal
- Evaporation
- Recovery

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock
- CPT Locations
- SSA Locations
- Test Pit Locations
- Grab Sample Locations

0 462.5 925 1,850 2,775 3,700

Metres

LWC Land & Water Consulting

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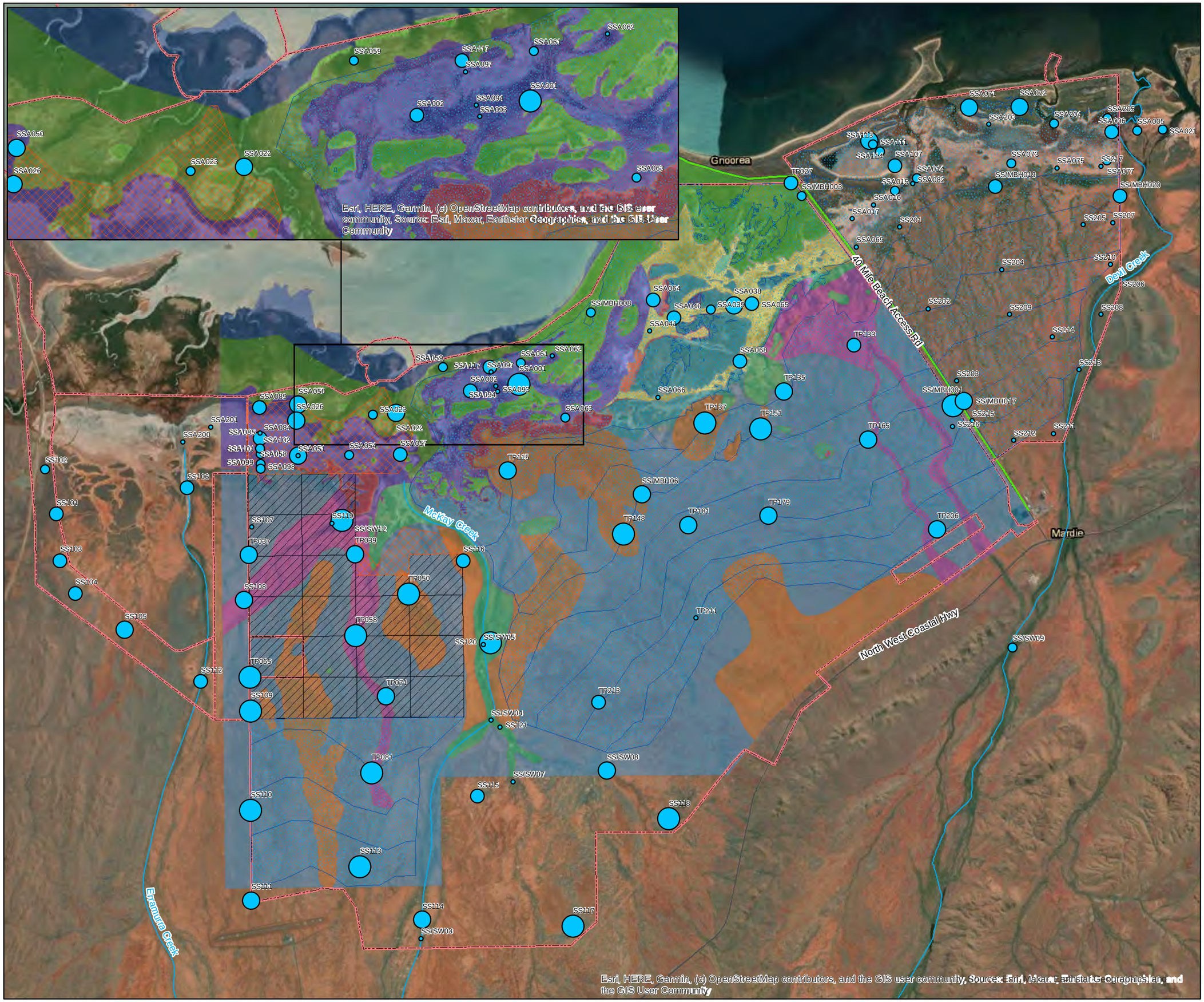
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Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Soil Investigation Location Plan

Date: July 2022	Projection: GDA94 Z50
Scale: See Plan	Figure in Set: x of x
Site Address: Mardie, Western Australia	Figure 2 Revision A
Drawing Reference AAAA	

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Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock

Total Nitrogen (mg/kg)

- <66
- 66 - 150
- 150 - 290
- 290 - 470
- 470 - 1100

0 487.5 975 1,950 2,925 3,900

Metres

N

Land & Water Consulting
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Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Graduated Concentration Plots for Total Nitrogen

Date: July 2022

Projection: GDA94 Z50

Scale: See Plan

Figure in Set: 3 of 12

Site Address:
Mardie, Western Australia

Figure 3 Revision A

Drawing Reference AAAA

Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Algal Mat Activity

- Active
- Limited Activity
- Low Far
- Low Near

Total Nitrogen (mg/kg)

- <66
- 66 - 150
- 150 - 290
- 290 - 470
- 470 - 1100

Eramurra Creek
McKay Creek
40 Mile Beach Access Rd
Devil Creek

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Graduated Concentration Plots for
Total Nitrogen with Algal Mat Activity

Date: July 2022	Projection: GDA94 Z50
Scale: See Plan	Figure in Set: 4 of 12

Site Address:
Mardie, Western Australia

Figure 4 Revision A

Drawing Reference AAAA

Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock

Total Organic Carbon

- 0.1-0.4
- 0.4-0.75
- 0.75-1.7
- 1.7-2.7
- 2.7-10

0 462.5 925 1,850 2,775 3,700

Metres

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Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Graduated Concentration Plots for
Total Organic Carbon

Date: July 2022 | Projection: GDA94 Z50

Scale: See Plan | Figure in Set: 5 of 12

Site Address:
Mardie, Western Australia

Figure 5 Revision A

Drawing Reference AAAA

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Algal Mat Activity

- Active
- Limited Activity
- Low Far
- Low Near

Total Organic Carbon (%)

- 0.1-0.4
- 0.4-0.75
- 0.75-1.7
- 1.7-2.7
- 2.7-10.0

Eramurra Creek
McKay Creek
40 Mile Beach Access Rd
Devil Creek

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

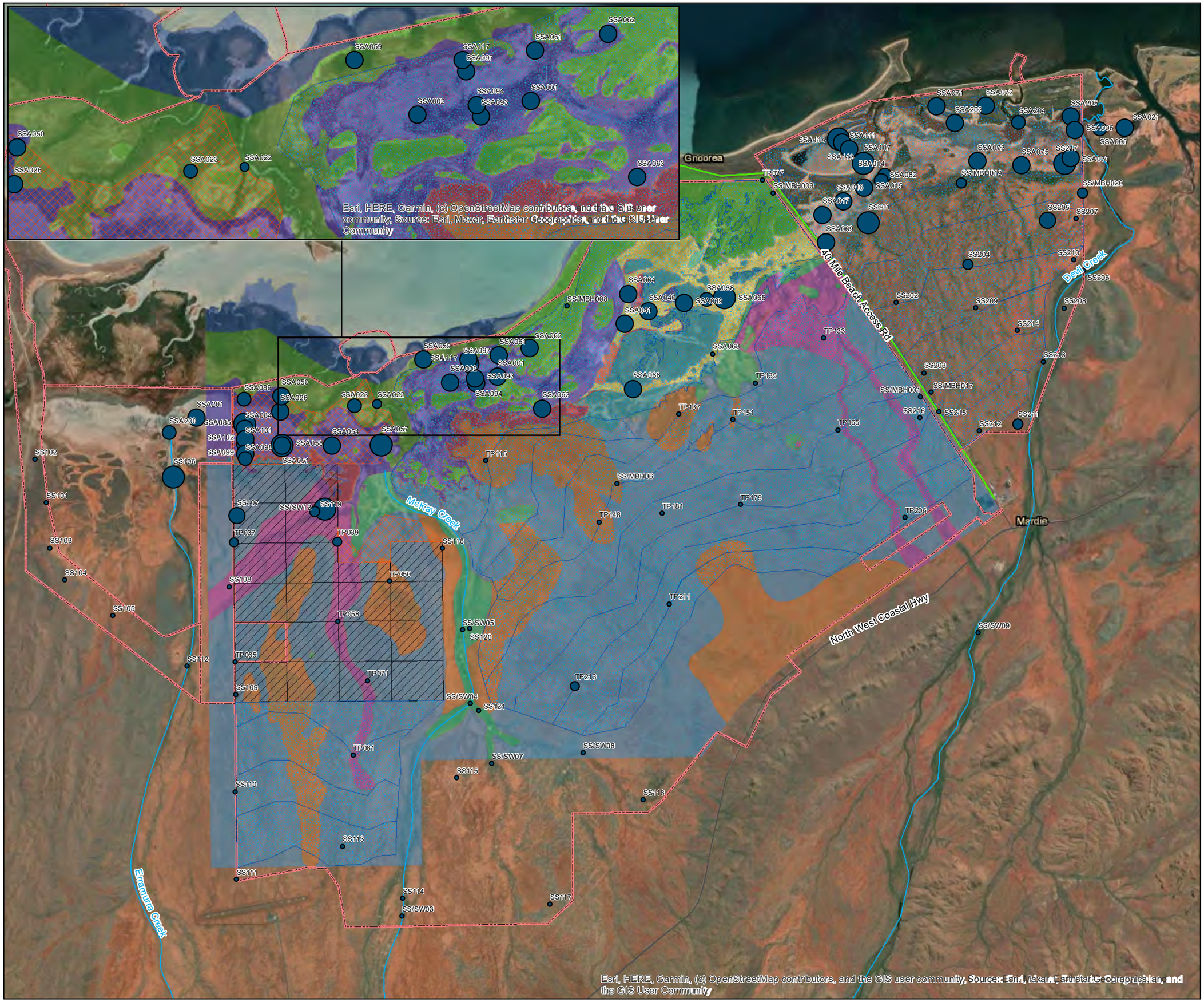
Figure Title:
Graduated Concentration Plots for
Total Organic Carbon with Algal Mat Activity

Date: July 2022
Projection: GDA94 Z50
Scale: See Plan
Figure in Set: 6 of 12

Site Address:
Mardie, Western Australia

Figure 6 Revision A

Drawing Reference AAAA



Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock

Electrical Conductivity (µS/cm)

- <1000
- 1001 - 3500
- 3501 - 7500
- 7501 - 15000
- 15001 - 25000

0 500 1,000 2,000 3,000 4,000
Metres

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Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

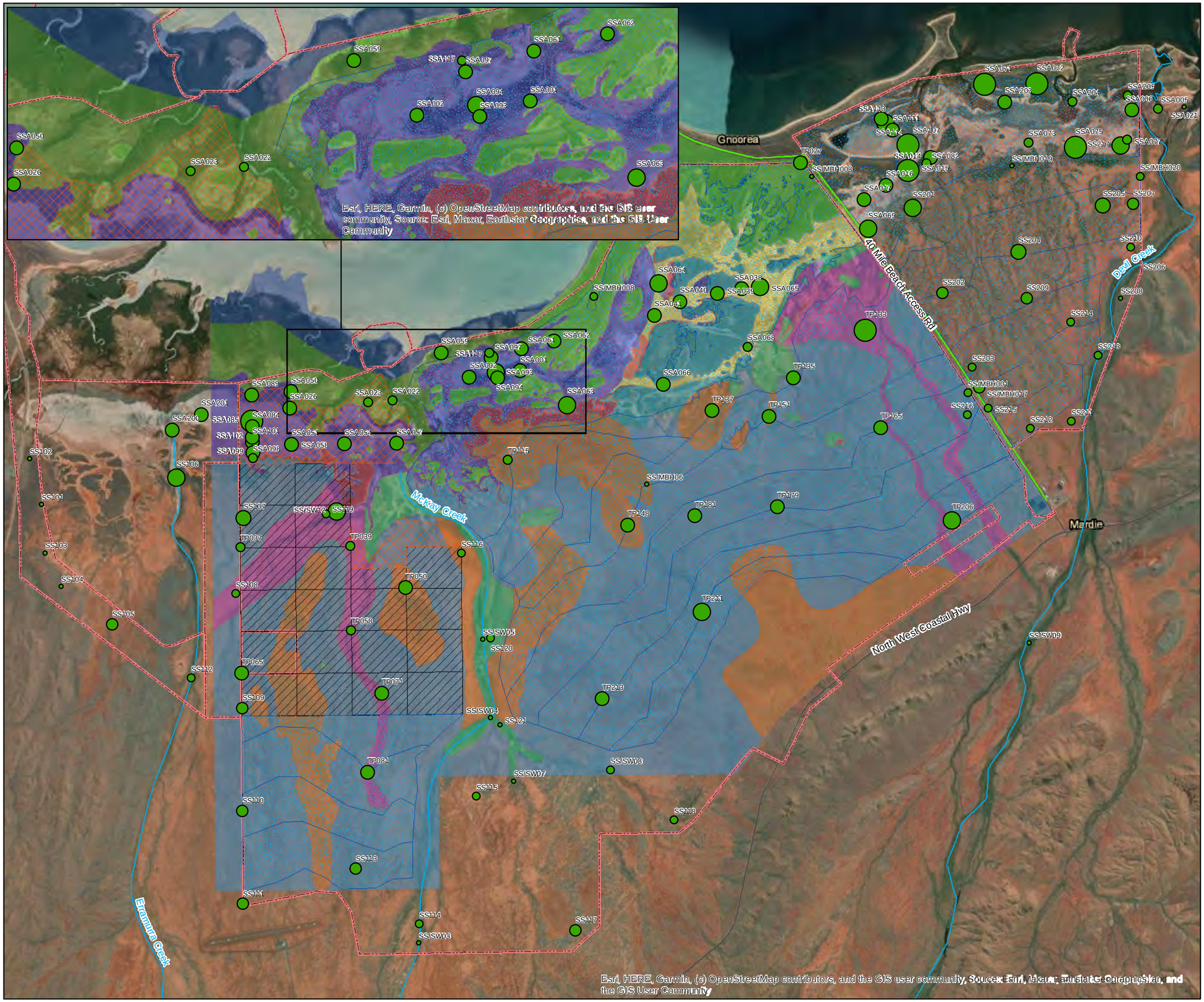
Figure Title:
Graduated Concentration Plots for Electrical Conductivity (µS/cm)

Date: July 2022	Projection: GDA94 Z50
Scale: See Plan	Figure in Set: 7 of 12

Site Address:
Mardie, Western Australia

Figure 7 Revision A

Drawing Reference AAAA



Legend

Pond Type

- Crystal
- Evaporation
- Recovery
- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock

Cation Exchange Capacity (meq/100g)

- 13 - 15
- 16 - 30
- 31 - 45
- 46 - 60
- 61 - 190

0 470 940 1,880 2,820 3,760

Metres

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N

Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Graduated Concentration Plots for
Cation Exchange Capacity (meq/100g)

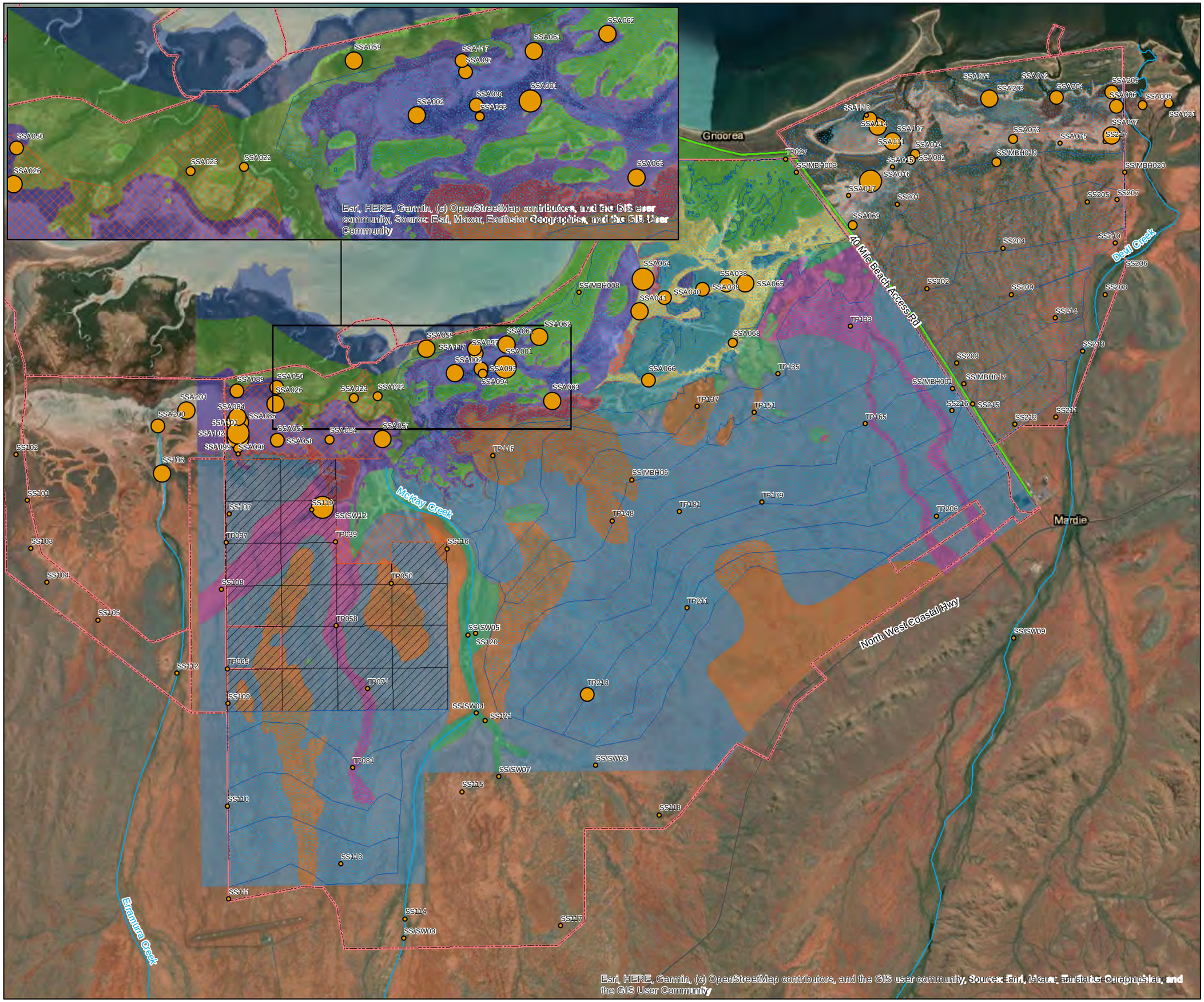
Date: July 2022 | Projection: GDA94 Z50

Scale: See Plan | Figure in Set: 8 of 12

Site Address:
Mardie, Western Australia

Figure 8 Revision A

Drawing Reference AAAA



Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock

Sulfate as SO4 (mg/kg)

- 30 - 500
- 501 - 1500
- 1501 - 3000
- 3001 - 5000
- 5001 - 11000

0 475 950 1,900 2,850 3,800

Metres

N

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Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Graduated Concentration Plots for Sulfate as SO4

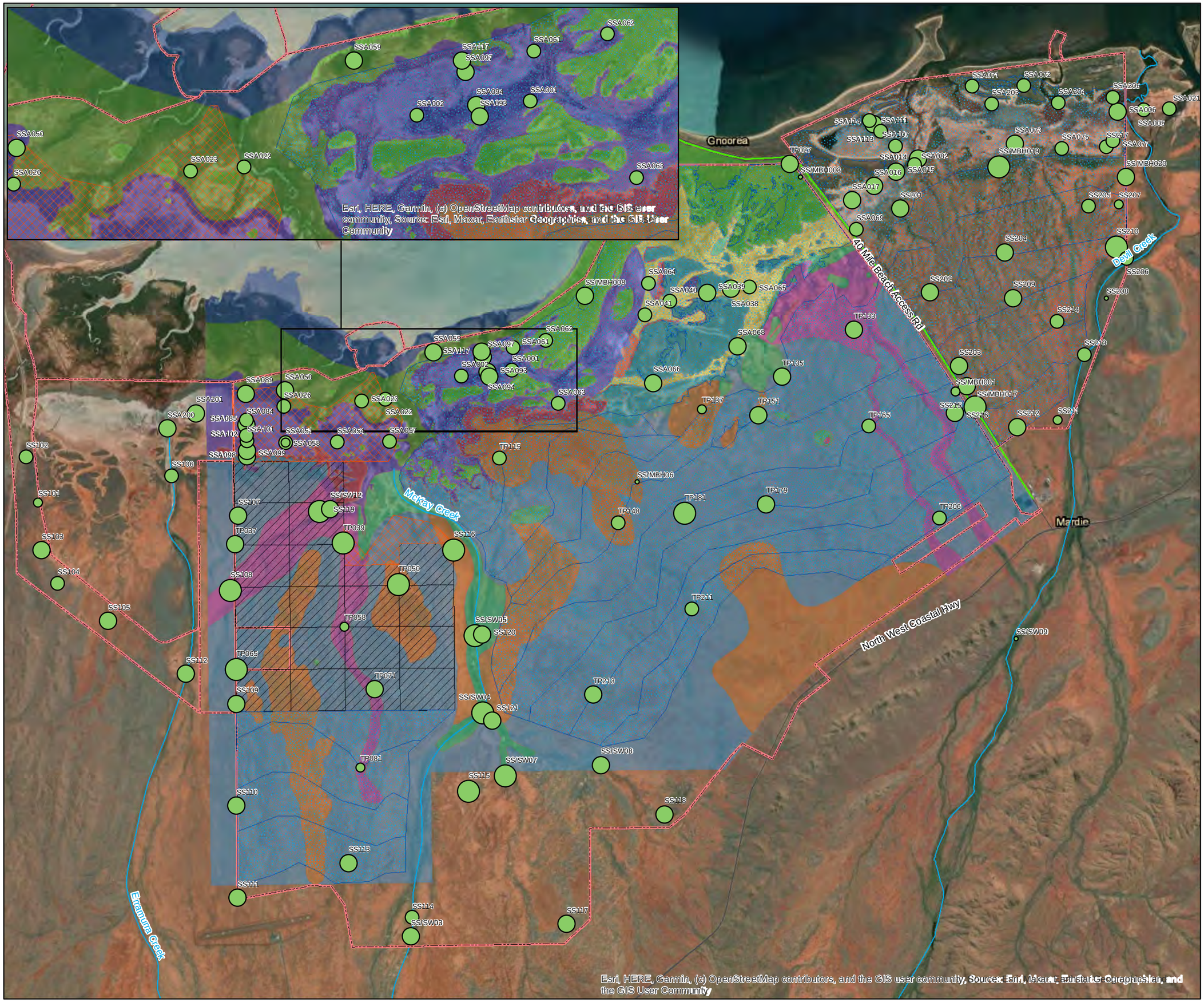
Date: July 2022 | Projection: GDA94 Z50

Scale: See Plan | Figure in Set: 9 of 12

Site Address:
Mardie, Western Australia

Figure 9 Revision A

Drawing Reference AAAA



Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock

pH (1:5 Aqueous extract at 25°C)

- 6.9-7.1
- 7.1-7.9
- 7.9-8.5
- 8.5-9
- 9-9.9

0 475 950 1,900 2,850 3,800

Metres

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N

Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Graduated Concentration Plots for
pH (1:5 Aqueous extract at 25°C)

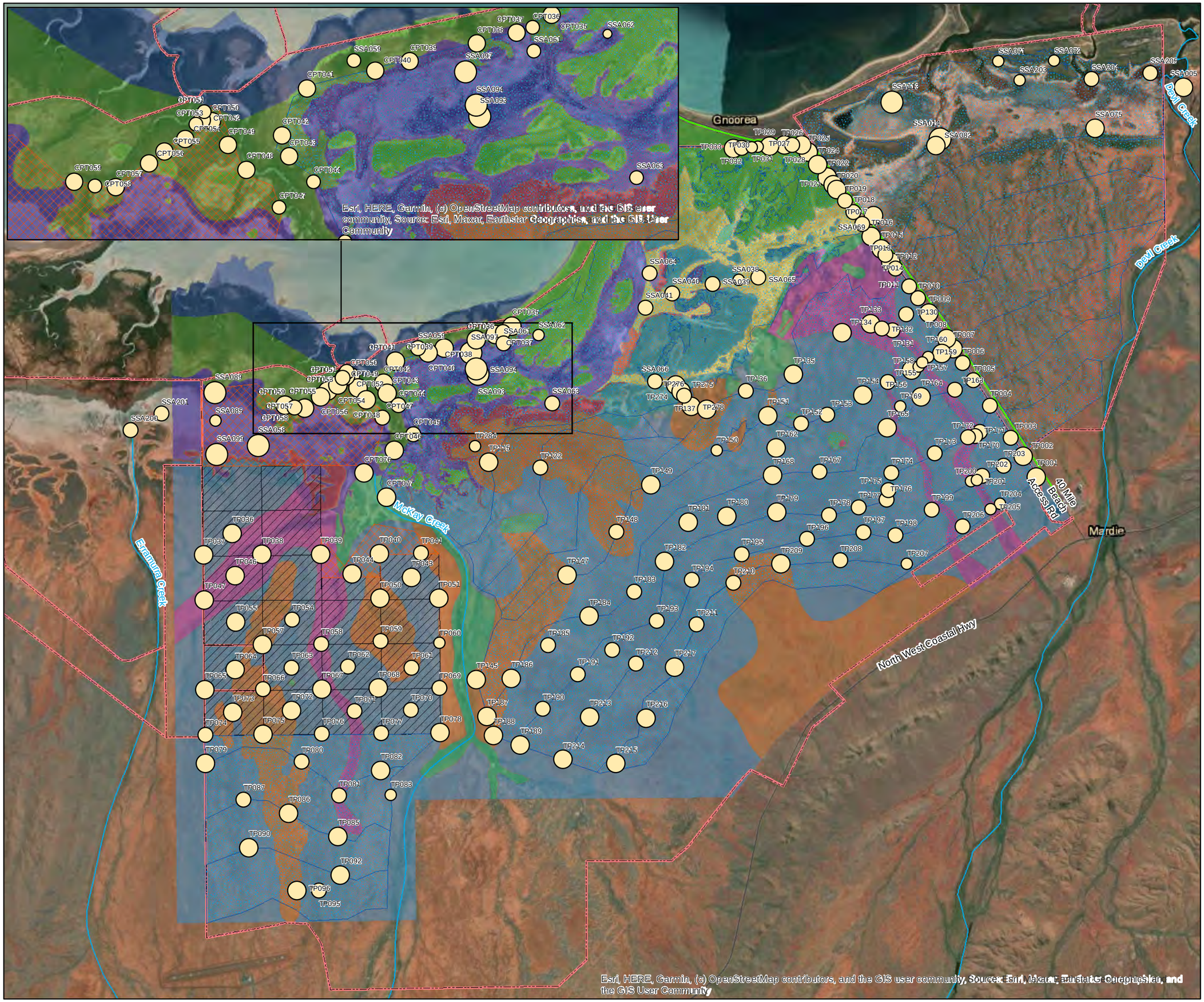
Date: July 2022 | Projection: GDA94 Z50

Scale: See Plan | Figure in Set: 10 of 12

Site Address:
Mardie, Western Australia

Figure 10 Revision A

Drawing Reference AAAA



Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock

pH Field

- 7.4 - 8.4
- 8.4 - 9.1
- 9.1 - 10.0
- 10.0 - 13.0

0 440 880 1,760 2,640 3,520

Metres

N

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Web: www.lwconsulting.com.au

Project:
Eramura Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Graduated Concentration Plots for pH Field

Date: July 2022

Projection: GDA94 Z50

Scale: See Plan

Figure in Set: 11 of 12

Site Address:
Mardie, Western Australia

Figure 11

Revision A

Drawing Reference AAAA

Legend

- Development Envelope
- Water Courses
- Gas Pipeline
- Roads

Pond Type

- Crystal
- Evaporation
- Recovery

Geology Description (CMW, 2022)

- Alluvial soil (sheetwash gravel over res. soil)
- Alluvial soils (braided channel gravels)
- Beach rock
- Calcarenite
- Calcarenite (inferred)
- Eolian sand (over calcarenite)
- Eolian sand (over granitoid/mafic rocks)
- Lagoonal mud
- Mangrove and Inter-tidal muds
- Mangrove mud
- Predominantly Doleritic dyke
- Predominantly Granitoid rocks
- Residual soil
- Thin Lagoonal Mud over Igneous Rock

pH Field Oxidised

- 3.1 - 6.3
- 6.3 - 7.4
- 7.4 - 8.4
- 8.4 - 9.1
- 9.1 - 10.0
- 10.0 - 12.0

0 440 880 1,760 2,640 3,520

Metres

Land & Water Consulting
Email: enquiries@lwconsulting.com.au
Web: www.lwconsulting.com.au

N

Project:
Eramurra Salt Project
Soil and Sediment Phase 1 and 2

Figure Title:
Graduated Concentration Plots for
pH Field Oxidised

Date: July 2022 | Projection: GDA94 Z50

Scale: See Plan | Figure in Set: 12 of 12

Site Address:
Mardie, Western Australia

Figure 12 Revision A

Drawing Reference AAAA

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

TABLES

Table 1 - Summary of Analytical Results - P1 - Test Pit Samples

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

			Field ID	TP37_0	TP148_0	TP135_0	TP137_0	TP27_0	TP39_0	TP50_0	TP58_0	TP65_0	TP71_0
			Date	27/08/2021	10/09/2021	10/09/2021	18/09/2021	12/09/2021	26/08/2022	26/08/2022	20/08/2021	22/08/2021	22/08/2021
			Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
			Laboratory Report No	852134	852134	852134	852134	849207	849207	849207	849207	849207	849207
			Duplicate										
			Material Description	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown; sand, fine to medium grained; trace gravel, fine to medium grained, subangular. (Residual Soil)	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	CL - Cl: SANDY CLAY: low to medium plasticity, pale orange brown; sand is fine to coarse grained; with gravel, fine grained, subangular to subrounded (Alluvial soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. Interbedded with CLAY with sand. (Residual Soil)
Analyte		**Unit**	**LOR**										
Acid Sulfate Soils Field pH Test													
	pH-F (Field pH test)*	pH Units	0.1	-	-	-	-	-	-	-	-	-	-
	pH-FOX (Field pH Peroxide test)*	pH Units	0.1	-	-	-	-	-	-	-	-	-	-
	Reaction Rate	Factor		-	-	-	-	-	-	-	-	-	-
Nutrients													
	Nitrate & Nitrite (as N)	mg/kg	5	9.5	< 5	14	< 5	< 5	18	7	39	< 5	7
	Phosphorus	mg/kg	5	< 5	< 5	< 5	18	110	150	220	300	150	160
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	370	580	440	830	240	300	600	1000	580	350
	Total Nitrogen (as N)*	mg/kg	10	379.5	580	454	830	240	318	607	1039	580	357
	Total Organic Carbon	%	0	0.4	0.9	0.7	3.3	0.5	0.9	3.1	1.9	1.1	0.7
Cations and Anions													
	Chloride	mg/kg	5	2700	18	9.4	120	120	< 5	100	330	2200	1200
	Sulphate (as SO4)	mg/kg	30	130	< 30	< 30	66	< 30	< 30	< 30	< 30	250	< 30
General Parameters													
	% Moisture	%	1	5	5.3	4.9	2.4	5.7	2.2	4.4	10	7.7	5.3
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	1500	130	140	170	520	1700	89	220	1000	790
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	9	8.4	8.6	7.2	8.8	9.2	9.2	7.5	9.3	8.6
	Cation Exchange Capacity	meq/100 g	0.1	28	31	34	38	36	28	35	29	41	41
	Resistivity	Ohm.m		6.8	76	73	59	19	5.8	110	46	9.8	13

Table 1 - Summary of Analytical Results - P1 - Test Pit Samples

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

			Field ID	TP81_0	TP115_0	TP133_0	TP151_0	TP165_0	TP179_0	TP181_0	TP206_0	TP211_0	TP213_0
			Date	29/08/2021	23/09/2021	10/09/2021	9/09/2021	6/09/2021	20/09/2021	10/09/2021	22/09/2021	22/09/2021	21/09/2021
			Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
			Laboratory Report No	849207	849207	849207	849207	849207	849207	849207	849207	849207	849207
			Duplicate										
			Material Description	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl - CH: SANDY CLAY: medium to high plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)
Analyte		**Unit**	**LOR**										
Acid Sulfate Soils Field pH Test													
	pH-F (Field pH test)*	pH Units	0.1	-	-	-	-	-	-	-	-	-	-
	pH-FOX (Field pH Peroxide test)*	pH Units	0.1	-	-	-	-	-	-	-	-	-	-
	Reaction Rate	Factor		-	-	-	-	-	-	-	-	-	-
Nutrients													
	Nitrate & Nitrite (as N)	mg/kg	5	< 5	< 5	< 5	9.6	< 5	< 5	< 5	< 5	< 5	24
	Phosphorus	mg/kg	5	240	140	160	170	140	130	150	170	160	220
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	710	400	210	600	470	430	360	370	20	150
	Total Nitrogen (as N)*	mg/kg	10	710	400	210	609.6	470	430	360	370	20	174
	Total Organic Carbon	%	0	1.4	0.5	0.7	5.6	< 0.1	0.3	3.9	0.9	0.7	2.9
Cations and Anions													
	Chloride	mg/kg	5	< 5	28	52	94	59	< 5	20	28	26	2400
	Sulphate (as SO4)	mg/kg	30	< 30	< 30	120	< 30	< 30	< 30	< 30	270	380	1800
General Parameters													
	% Moisture	%	1	3.8	4.2	6.5	4.7	6.3	3.6	7.2	4.3	7.8	19
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	44	51	300	84	140	56	130	240	140	1500
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	7.8	8.3	8.9	8.6	8.5	8.6	9.2	8.3	8.3	8.7
	Cation Exchange Capacity	meq/100 g	0.1	31	21	62	42	41	40	43	54	56	34
	Resistivity	Ohm.m		230	200	34	120	71	180	75	42	74	6.7

Table 2 - Summary of Analytical Results - P1 - Surface Samples from Beneath Algal Mats

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

			Field ID	SSA001_50-100	SSA002_100-150	SSA026_100-150	SSA050_100-150	SSA051_50-90	SSA061_100-150	SSA062_100-150	SSA068_50-100	SSA073_100-150
			Date	8.9.21	11.8.21	12.8.21	12.8.21	12.8.21	8.8.21	8.8.21	8.8.21	24.9.21
			Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
			Laboratory Report No	852134	852134	852134	852134	852134	852134	852134	852134	852134
			Material Descrption	SAND: fine to medium grained, rounded; red brown; with clay ; dense becoming very dense at base with shells	SAND: fine to medium grained, rounded; red brown, with clay	CLAY: red brown; with sand, fine to medium grained; soft to firm	SANDY CLAY: red brown; medium plasticity; sand, fine to medium grained	SAND: fine to medium grained; with gravel, fine to coarse grained, of dolerite, quartz and shells. 0.09m - weakly cemented (calcrete?); with clay	CLAYEY SAND: fine to medium grained; red brown; dense	SANDY CLAY: medium plasticity; red brown; sand, fine grained	Not Recorded	SAND: red brown; trace fines
Analyte		Unit	LOR									
Nutrients												
	Nitrate & Nitrite (as N)	mg/kg	5	< 5	6.5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Phosphorus	mg/kg	5	39	42	52	20	< 5	9.8	31	16	22
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	950	240	320	370	35	320	300	250	100
	Total Nitrogen (as N)*	mg/kg	10	950	246.5	320	370	35	320	300	250	100
	Total Organic Carbon	%	0	1.2	0.8	0.7	0.3	< 0.1	1.6	1.9	0.3	< 0.1
Cations and Anions												
	Calcium	mg/kg	5.0	-	-	-	-	-	-	-	-	-
	Magnesium	mg/kg	5	-	-	-	-	-	-	-	-	-
	Potassium	mg/kg	5	-	-	-	-	-	-	-	-	-
	Sodium	mg/kg	5	-	-	-	-	-	-	-	-	-
	Chloride	mg/kg	5	37000	34000	29000	25000	18000	30000	46000	320	19000
	Sulphate (as SO4)	mg/kg	30	5600	3300	3300	3000	2100	3100	6500	920	1400
Other Metals												
	Aluminium	mg/kg	20	-	-	-	-	-	-	-	-	-
	Iron	mg/kg	20	-	-	-	-	-	-	-	-	-
General Parameters												
	% Moisture	%	1	24	23	27	32	15	24	26	2.1	11
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	15000	15000	12000	10000	14000	13000	17000	750	10000
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.4	8.5	8.5	8.7	8.4	8.4	8.5	9	8.6
	Cation Exchange Capacity	meq/100g	0.1	37	36	34	39	31	34	46	30	23
	Resistivity	Ohm.m	0.1	0.7	0.7	0.9	1	0.7	0.8	0.6	13	1

Table 2 - Summary of Analytical Results - P1 - Surface Samples from Beneath Algal Mats

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Field ID	**SSA101_100-150**	**SSA102_100-150**	**SSA117_100-150**	**SSA023_100-150**	**SSA5_100-150**	**SSA6_100-150**	**SSA11_100-150**	**SSA15_100-150**	**SSA16_100-150**
		Date	**12.8.21**	**12.8.21**	**11.8.21**	**12.8.21**	**24.9.21**	**24.9.21**	**24.9.21**	**23.9.21**	**23.9.21**
		Laboratory	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**
		Laboratory Report No	**852134**	**852134**	**852134**	**852134**	**849207**	**849207**	**849207**	**849207**	**849207**
		Material Descrption	Not Recorded	Not Recorded	CLAYEY SAND: fine to medium grained; red brown; dense	CLAYEY SAND: fine to medium grained; red brown	SAND: dark orange brown; trace to with clay	CLAYEY SAND: fine to medium grained; dark orange brown; clay, medium plasticity	SAND: fine to medium grained; orange brown; trace clay, medium plasticity	CLAYEY SAND: fine to coarse grained; red brown; clay, medium plasticity; with gravel	CLAYEY SAND SC: fine to coarse grained; red brown; clay, medium plasticity; with gravel
Analyte		**Unit**	**LOR**								
Nutrients											
	Nitrate & Nitrite (as N)	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Phosphorus	mg/kg	5	19	< 5	9.3	20	140	210	140	240
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	130	110	170	150	160	220	89	92
	Total Nitrogen (as N)*	mg/kg	10	130	110	170	150	160	220	89	92
	Total Organic Carbon	%	0	< 0.1	0.3	1.3	< 0.1	< 0.1	0.5	0.6	4.2
Cations and Anions											
	Calcium	mg/kg	5.0	-	-	-	-	-	-	-	-
	Magnesium	mg/kg	5	-	-	-	-	-	-	-	-
	Potassium	mg/kg	5	-	-	-	-	-	-	-	-
	Sodium	mg/kg	5	-	-	-	-	-	-	-	-
	Chloride	mg/kg	5	24000	29000	16000	8000	11000	18000	35000	15	36000
	Sulphate (as SO4)	mg/kg	30	6800	5900	2100	1000	2000	2500	3900	68	6700
Other Metals											
	Aluminium	mg/kg	20	-	-	-	-	-	-	-	-
	Iron	mg/kg	20	-	-	-	-	-	-	-	-
General Parameters											
	% Moisture	%	1	16	21	19	17	22	28	24	23	14
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	13000	13000	7900	4300	3600	7800	13000	15000	13000
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.4	8.4	8.7	8.3	8.2	8.7	8.3	8.6	8.7
	Cation Exchange Capacity	meq/100g	0.1	43	40	28	24	13	39	34	69	35
	Resistivity	Ohm.m	0.1	0.8	0.8	1.3	2.3	2.8	1.3	0.8	0.7	0.8

Table 2 - Summary of Analytical Results - P1 - Surface Samples from Beneath Algal Mats

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

			Field ID	SSA17_100-150	SSA21_100-150	SSA22_100-150	SSA54_75-150	SSA57_100-150	SSA77_100-150	SSA84_70-100	SSA98_60-70	SSA107_100-150
			Date	23.9.21	24.9.21	12.8.21	12.8.21	11.8.21	24.9.21	13.8.21	12.8.21	23.9.21
			Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
			Laboratory Report No	849207	849207	849207	849207	849207	849207	849207	849207	849207
			Material Descrption	CLAY: Cl: medium plasticity; red brown; trace sand, fine to medium grained.	CLAY: medium to high plasticity; red brown; with sand, fine grained	CLAY: medium plasticity; red brown; with sand	SAND: fine to medium grained; red brown; with clay	SAND: fine grained; red brown; trace clay medium to high plasticity	SAND: dark orange brown; trace to with clay	Not Recorded	CLAYEY SAND: fine to medium grained; red brown; weakly cemented at 70mm	SANDY CLAY: fine to medium grained; orange brown; trace gravel
Analyte		**Unit**	**LOR**									
Nutrients												
	Nitrate & Nitrite (as N)	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Phosphorus	mg/kg	5	160	210	200	180	290	220	270	77	250
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	33	97	450	110	230	150	210	100	170
	Total Nitrogen (as N)*	mg/kg	10	33	97	450	110	230	150	210	100	170
	Total Organic Carbon	%	0	< 0.1	0.6	1.3	1.3	1.2	0.4	1.5	3	1.3
Cations and Anions												
	Calcium	mg/kg	5.0	-	-	-	-	-	-	-	-	-
	Magnesium	mg/kg	5	-	-	-	-	-	-	-	-	-
	Potassium	mg/kg	5	-	-	-	-	-	-	-	-	-
	Sodium	mg/kg	5	-	-	-	-	-	-	-	-	-
	Chloride	mg/kg	5	3700	4100	7900	6700	50000	44000	50000	1600	40000
	Sulphate (as SO4)	mg/kg	30	470	600	1500	810	4500	4800	7200	330	3100
Other Metals												
	Aluminium	mg/kg	20	-	-	-	-	-	-	-	-	-
	Iron	mg/kg	20	-	-	-	-	-	-	-	-	-
General Parameters												
	% Moisture	%	1	13	24	23	25	26	20	25	5.8	25
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	11000	9900	3500	14000	16000	13000	15000	4000	17000
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	9	8.4	8.3	8.5	8.4	8	8.6	8.8	8.5
	Cation Exchange Capacity	meq/100g	0.1	35	13	29	39	39	21	38	25	81
	Resistivity	Ohm.m	0.1	0.9	1	2.9	0.7	0.6	0.8	0.7	2.5	0.6

Table 2 - Summary of Analytical Results - P1 - Surface Samples from Beneath Algal Mats

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

			Field ID	SSA114_100-150	SSA200_50	SSA201_100	SSA099R_0-50	SSA102R_100	SSA059_100	SSA061_00	SSA085R_100	SSA062
			Date	23.9.21	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21
			Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
			Laboratory Report No	849207	856518	856518	856518	856518	856518	856518	856518	856518
			Material Descrption	SAND: orange brown; trace clay	Not Recorded	Not Recorded	SAND: fine to medium grained; red brown; with clay	Not Recorded	Not Recorded	CLAYEY SAND: fine to medium grained; red brown; dense	SANDY CLAY: medium plasticity; red brown; sand, fine grained	SANDY CLAY: medium plasticity; red brown; sand, fine grained
Analyte		Unit	LOR									
Nutrients												
	Nitrate & Nitrite (as N)	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Phosphorus	mg/kg	5	230	120	200	110	230	250	200	270	300
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	310	39	48	< 10	51	88	77	30	66
	Total Nitrogen (as N)*	mg/kg	10	310	39	48	< 10	51	88	77	30	66
	Total Organic Carbon	%	0	0.2	10	0.4	1.1	0.2	1	1.1	1.2	0.2
Cations and Anions												
	Calcium	mg/kg	5.0	-	220000	31000	88000	29000	45000	20000	55000	5000
	Magnesium	mg/kg	5	-	8900	23000	16000	26000	37000	29000	44000	30000
	Potassium	mg/kg	5	-	1200	3000	980	3700	2700	3800	4200	5800
	Sodium	mg/kg	5	-	11000	18000	9300	17000	22000	22000	30000	25000
	Chloride	mg/kg	5	260	14000	22000	18000	2300	28000	35000	44000	36000
	Sulphate (as SO4)	mg/kg	30	150	2600	3900	3100	3000	5000	4000	4800	4000
Other Metals												
	Aluminium	mg/kg	20	-	6400	13000	4900	19000	11000	16000	14000	24000
	Iron	mg/kg	20	-	14000	30000	38000	44000	33000	34000	26000	42000
General Parameters												
	% Moisture	%	1	35	14	21	8.3	19	22	21	25	28
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	16000	7500	9900	7200	10000	14000	15000	16000	11000
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.3	8.9	8.6	8	8.7	8.6	8.4	8.5	8.3
	Cation Exchange Capacity	meq/100g	0.1	34	32	40	38	61	41	33	92	34
	Resistivity	Ohm.m	0.1	0.6								

Table 2 - Summary of Analytical Results - P1 - Surface Samples from Beneath Algal Mats

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

			Field ID	SSA063_100	SSA064_100	SSA065_100	SSA066_100	SSA039_100	SSA205_100	SSA038_100	SSA204_100	SSA040_100
			Date	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21	17.12.21
			Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
			Laboratory Report No	856518	856518	856518	856518	856518	856518	856518	856518	856518
			Material Descrption	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded
	Analyte	Unit	LOR									
Nutrients												
	Nitrate & Nitrite (as N)	mg/kg	5	< 5	< 5	7.1	< 5	< 5	< 5	< 5	< 5	< 5
	Phosphorus	mg/kg	5	300	290	310	240	160	240	170	140	210
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	120	180	200	33	120	80	310	140	210
	Total Nitrogen (as N)*	mg/kg	10	120	180	207.1	33	120	80	310	140	210
	Total Organic Carbon	%	0	0.3	0.6	0.8	0.6	0.2	0.4	0.6	0.3	0.4
Cations and Anions												
	Calcium	mg/kg	5.0	23000	21000	35000	33000	13000	2400	8100	5300	14000
	Magnesium	mg/kg	5	33000	37000	46000	33000	24000	21000	19000	12000	39000
	Potassium	mg/kg	5	5000	4300	4500	2300	2000	4000	3000	2300	3200
	Sodium	mg/kg	5	26000	25000	25000	9400	11000	15000	6900	6800	16000
	Chloride	mg/kg	5	32000	40000	38000	13000	13000	17000	13000	11000	27000
	Sulphate (as SO4)	mg/kg	30	4400	5100	4200	2100	2300	3000	2100	1700	2600
Other Metals												
	Aluminium	mg/kg	20	20000	17000	18000	12000	11000	25000	17000	11000	16000
	Iron	mg/kg	20	38000	37000	34000	28000	31000	48000	35000	25000	33000
General Parameters												
	% Moisture	%	1	26	26	27	18	17	21	22	19	29
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	13000	13000	18000	8100	8300	11000	6200	5800	8500
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.5	8.5	8.3	8.6	8.6	8.3	8.6	8.3	8.1
	Cation Exchange Capacity	meq/100g	0.1	50	47	48	35	35	28	39	24	40
	Resistivity	Ohm.m	0.1									

Table 2 - Summary of Analytical Results - P1 - Surface Samples from Beneath Algal Mats

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Field ID	**SSA071_100**	**SSA203_50**	**SSA041_100**	**SSA072_50**	**SSA058_0-50**	**SSA058_100-150**	**SSA093_100-150**	**SSA097_25-75**	**SSA094_100-150**
		Date	**17.12.21**	**17.12.21**	**17.12.21**	**17.12.21**	**8.8.21**	**8.8.21**	**8.8.21**	**11.8.21**	**11.8.21**
		Laboratory	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**
		Laboratory Report No	**856518**	**856518**	**856518**	**856518**	**829438**	**829438**	**829438**	**829438**	**829438**
		Material Descrption	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	Not Recorded	CLAYEY SAND: fine to medium grained; red brown	SAND: fine to medium grained; red brown; with clay
Analyte	**Unit**	**LOR**									
Nutrients											
Nitrate & Nitrite (as N)	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Phosphorus	mg/kg	5	230	180	200	460	160	< 100	370	300	310
Total Kjeldahl Nitrogen (as N)	mg/kg	10	360	34	21	400	320	< 10	50	60	51
Total Nitrogen (as N)*	mg/kg	10	360	34	21	400	320	< 10	50	60	51
Total Organic Carbon	%	0	0.5	3.1	1.2	2	0.9	4	1.2	2.1	< 0.1
Cations and Anions											
Calcium	mg/kg	5.0	88000	5100	36000	48000	62000	75000	82000	100000	96000
Magnesium	mg/kg	5	46000	38000	33000	74000	27000	4900	53000	35000	45000
Potassium	mg/kg	5	1400	3000	2300	2800	2800	390	2200	2100	2300
Sodium	mg/kg	5	7400	19000	15000	9200	64000	3300	23000	19000	17000
Chloride	mg/kg	5	14000	28000	24000	12000	24000	6000	17000	22000	17000
Sulphate (as SO4)	mg/kg	30	11000	3200	3100	10000	2200	610	1500	2300	1600
Other Metals											
Aluminium	mg/kg	20	6300	14000	12000	16000	9800	3200	11000	7300	9300
Iron	mg/kg	20	9100	27000	23000	22000	23000	19000	45000	14000	24000
General Parameters											
% Moisture	%	1	13	20	21	13	28	4.5	17	22	20
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	9300	14000	13000	9300	25000	4500	8800	11000	8400
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.3	8.3	8.5	8.4	7.9	9.1	8.7	8.7	8.8
Cation Exchange Capacity	meq/100g	0.1	190	32	39	130	41	25	37	39	47
Resistivity	Ohm.m	0.1									

Table 2 - Summary of Analytical Results - P1 - Surface Samples from Beneath Algal Mats

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Field ID	**SSA099_60-80**	**SSA089_100-150**	**SSA069_100-150**	**SSA113_100-150**	**SSA082_100-150**	**SSA014_100-150**	**SSA075_100-150**	**SSA005_100-150**
		Date	**12.8.21**	**13.8.21**	**23.9.21**	**23.9.21**	**24.9.21**	**24.9.21**	**24.9.21**	**24.9.21**
		Laboratory	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**	**Eurofins**
		Laboratory Report No	**829438**	**829438**	**829438**	**829438**	**829438**	**829438**	**829438**	**829438**
		Material Descrption	SAND: fine to medium grained; red brown; with clay	Not Recorded	CLAY: Cl; medium plasticity; red brown; trace sand, fine to medium grained.	SAND: orange brown; trace clay	SAND: fine to coarse grained; orange brown	Not Recorded	SAND: red brown; trace fines	SAND: dark orange brown; trace to with clay
Analyte		**Unit**	**LOR**							
Nutrients										
	Nitrate & Nitrite (as N)	mg/kg	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Phosphorus	mg/kg	5	220	660	290	170	190	190	< 100	< 100
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	110	290	37	92	13	100	< 10	140
	Total Nitrogen (as N)*	mg/kg	10	110	290	37	92	13	100	< 10	140
	Total Organic Carbon	%	0	1.2	0.7	0.2	0.6	0.4	0.5	0.5	0.3
Cations and Anions										
	Calcium	mg/kg	5.0	110000	76000	23000	10000	1800	9700	4500	1800
	Magnesium	mg/kg	5	23000	47000	13000	19000	16000	16000	5000	7200
	Potassium	mg/kg	5	2000	5400	5700	770	1400	1700	1100	1500
	Sodium	mg/kg	5	17000	22000	22000	9500	9000	7900	3700	3800
	Chloride	mg/kg	5	15000	18000	32000	30000	7400	7300	7800	6300
	Sulphate (as SO4)	mg/kg	30	1000	1800	1300	2500	630	670	250	880
Other Metals										
	Aluminium	mg/kg	20	11000	25000	26000	3900	8400	11000	12000	14000
	Iron	mg/kg	20	30000	46000	53000	13000	29000	25000	25000	37000
General Parameters										
	% Moisture	%	1	18	29	16	27	14	21	17	17
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10.0	11000	6200	15000	14000	5600	5700	7900	3800
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.8	8.8	8.4	8.6	8.3	8.7	8.4	8.5
	Cation Exchange Capacity	meq/100g	0.1	40	41	55	47	29	32	61	30
	Resistivity	Ohm.m	0.1								

Table 3 - Summary of Analytical Results - P2 - Surface Samples

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Field ID	SS/MBH001	SS/MBH003	SS/MBH008	SS/MBH017	SS/MBH019	SS/MBH020	SS/MBH06	SS/SW03	SS/SW04	SS/SW05	SS/SW07	SS/SW08	SS/SW09	SS/SW12	SS101	SS102
Date	4/04/2022	4/04/2022	4/04/2022	4/04/2022	4/04/2022	4/04/2022	4/04/2022	4/04/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	4/04/2022	4/04/2022	30/03/2022	30/03/2022
Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
Laboratory Report	882083	882083	882083	882083	882083	882083	882083	882083	879589	879589	879589	879589	882083	882083	879589	879589
Duplicate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Material Description	Clayey Sandy SILT	Clayey Silty SAND	Clayey Silty SAND	Sandy Clayey SILT	Clayey Silty SAND	Clayey Sandy SILT	Silty Sandy CLAY	Gravelly SAND	Gravelly SAND	Gravelly SAND	Gravelly SAND	Silty SAND	Gravelly SAND	Clayey SILT	Sandy SILT	Sandy SILT
Analyte	**Unit**	**LOR**															
Nutrients																	
Nitrate & Nitrite (as N)	mg/kg	5	7.6	2.2	3.2	5.9	2.3	4.4	2.8	1.2	< 1	< 1	< 1	7.4	1.8	1.4	3	3.1
Nitrate	mg/kg	1	7.4	2.2	3.2	5.3	2.3	4.2	2.7	1.1	< 1	< 1	< 1	6.9	1.7	1.2	2.9	2.8
Phosphorus	mg/kg	5	110	160	370	95	96	91	76	100	73	61	60	130	160	500	170	94
Total Kjeldahl Nitrogen (as N)	mg/kg	10	610	140	130	410	180	180	340	34	28	14	14	320	94	1100	170	140
Total Nitrogen (as N)*	mg/kg	10	620	140	130	420	180	180	340	35	28	14	14	330	96	1100	170	140
Cations and Anions																		
Calcium	mg/kg	5.0	3200	1000	94000	21000	2100	5600	3400	20000	9600	9400	8100	39000	1600	48000	840	1100
Magnesium	mg/kg	5	5600	1900	5600	8700	3000	5800	2600	3600	2600	1800	3500	5200	9000	80000	2100	2500
Chloride	mg/kg	5	< 10	< 10	< 10	10	1400	3400	81	< 10	< 10	< 10	< 10	< 10	< 10	31000	< 10	38
Sulphate (as SO4)	mg/kg	10	270	160	88	180	770	330	220	< 10	< 10	< 10	< 10	< 10	44	11000	< 10	10
Other Metals																		
Iron	mg/kg	20	41000	13000	11000	43000	30000	27000	63000	14000	19000	8900	20000	31000	50000	44000	28000	20000
Manganese	mg/kg	20	830	140	150	760	500	390	890	670	650	290	850	960	660	660	420	160
General Parameters																		
% Moisture	%	1	4.7	2.6	< 1	6.9	2.7	2	5.1	< 1	< 1	< 1	< 1	7	< 1	22	7.9	5.8
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10	50	20	60	80	1,100	2,200	90	50	60	70	50	100	30	15,000	20	60
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	7.8	7	9	8.6	9.1	8.9	6.9	8.9	9.2	9.2	9.2	8.8	7.1	8.7	7.4	8
Cation Exchange Capacity	meq/100g	0.05	16	3	21	35	7.2	16	15	15	14	15	14	27	4.8	79	4.3	3.3
Total Organic Carbon	%	0.05	0.6	0.19	0.26	0.41	0.19	0.19	0.66	0.06	0.05	<0.05	<0.05	0.35	0.14	1.21	0.32	0.23
Exchangeable																		
Exchangeable Acidicity	cmolc/kg	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.5	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.5	< 0.1	< 0.1
Exchangeable Calcium	cmolc/kg	0.2	8.9	1.7	18	28	3	11	8.6	14	13	14	13	23	2.8	31	2.3	2.3
Exchangeable Magnesium	cmolc/kg	0.2	5.6	0.7	1.9	4.9	2.2	2.8	5	0.7	0.7	1	0.8	3.5	1.5	33	1.3	0.7
Exchangeable Potassium	cmolc/kg	0.05	1.2	0.41	0.3	1.3	0.92	0.51	0.84	0.2	< 0.2	< 0.2	< 0.2	0.75	0.3	2.8	0.43	0.32
Exchangeable Sodium	cmolc/kg	0.2	< 0.2	< 0.2	< 0.2	0.3	0.9	1.8	0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	12	0.3	< 0.2

Table 3 - Summary of Analytical Results - P2 - Surface Samples

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Field ID	SS103	SS104	SS105	SS106	SS107	DUP2	DUP2	SS108	DUP1	DUP1	SS109	SS110	SS111	SS112	SS113
Date	30/03/2022	30/03/2022	30/03/2022	4/04/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	ALS	Eurofins	Eurofins	ALS	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
Laboratory Report	879589	879589	879589	882083	879589	879589	EP2204125	879589	879589	EP2204125	879589	879589	879589	879589	879589
Duplicate	-	-	-	-	Primary	Intra-Laboratory	Inter-Laboratory	Primary	Intra-Laboratory	Inter-Laboratory	-	-	-	-	-
Material Description	Gravelly Silty CLAY	Gravelly Silty CLAY	Clayey SILT/ Silty CLAY	Sandy SILT	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Gravelly SILT	Gravelly SILT	Gravelly SILT	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Silty SAND	Clayey SILT/ Silty CLAY

Analyte		Unit	LOR													
Nutrients																
	Nitrate & Nitrite (as N)	mg/kg	5	2.2	2.5	5.2	< 1	26	13	17.1	3	3.5	2.4	3.6	5.1	4.2	3.4	7.9
	Nitrate	mg/kg	1	2	2.4	4.8	< 1	25	12	16.6	2.8	3.2	2.3	3.4	4.9	4.1	3.3	7.5
	Phosphorus	mg/kg	5	56	150	140	260	160	120	149	110	91	150	100	150	110	120	170
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	190	270	380	160	370	330	340	360	330	370	510	520	370	190	770
	Total Nitrogen (as N)*	mg/kg	10	190	270	390	160	400	340	360	360	330	370	510	530	370	190	780
Cations and Anions																		
	Calcium	mg/kg	5.0	950	2500	10000	120000	21000	12000	20200	9700	13000	6950	37000	27000	28000	8700	17000
	Magnesium	mg/kg	5	1600	3700	5600	30000	7700	6100	8660	5500	6300	6490	7700	8900	9000	5100	9500
	Chloride	mg/kg	5	< 10	< 10	37	37000	8000	3300	4870	< 10	630	<10	< 10	< 10	< 10	< 10	< 10
	Sulphate (as SO4)	mg/kg	10	< 10	< 10	< 10	4100	130	80	110	< 10	< 10	<10	< 10	< 10	< 10	< 10	< 10
Other Metals																		
	Iron	mg/kg	20	15000	38000	43000	24000	38000	36000	36000	35000	42000	39500	42000	46000	46000	26000	49000
	Manganese	mg/kg	20	230	540	900	210	1600	1500	702	770	870	726	930	1800	1100	390	890
General Parameters																		
	% Moisture	%	1	6.6	8.1	13	23	11	9.2	10.4	12	7.9	9.7	11	12	11	8.3	16
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10	20	20	110	15,000	4,200	2,400	2,860	110	110	56	100	100	100	80	110
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.6	8	9	8.4	8.8	9.2	9.1	9.3	9.3	9	8.9	8.8	8.9	8.9	8.6
	Cation Exchange Capacity	meq/100g	0.05	3.7	8.8	33	96	54	41	11.4	29	22	22	35	39	40	17	33
	Total Organic Carbon	%	0.05	0.3	0.28	0.37	0.53	0.35	0.31	0.36	0.31	0.3	0.3	0.42	0.38	0.35	0.22	0.52
Exchangeable																		
	Exchangeable Acidicity	cmolc/kg	0.1	< 0.1	< 0.1	< 0.1	0.7	< 0.1	< 0.1		< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Exchangeable Calcium	cmolc/kg	0.2	2.4	6	30	32	26	22	22.2	23	17	16	30	33	34	15	27
	Exchangeable Magnesium	cmolc/kg	0.2	0.9	2.3	2.3	47	6.2	4.4	3.8	4.5	3.7	4.3	4.3	4.5	4.8	2	4.3
	Exchangeable Potassium	cmolc/kg	0.05	0.43	0.54	0.8	3.9	0.79	0.77	0.6	0.91	0.87	0.8	0.9	1.1	1	0.44	1.5
	Exchangeable Sodium	cmolc/kg	0.2	< 0.2	< 0.2	0.3	12	21	14	3.4	0.7	0.5	0.8	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2

Table 3 - Summary of Analytical Results - P2 - Surface Samples

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Field ID	SS114	SS115	SS116	SS117	DUP3	DUP3	SS118	SS119	SS120	SS121	SS201	SS202	SS203	SS204	SS205
Date	4/04/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022	29/03/2022	30/03/2022	30/03/2022	30/03/2022	29/03/2022	29/03/2022	30/03/2022	30/03/2022
Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	ALS	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
Laboratory Report	882083	879589	879589	879589	879589	EP2204125	879589	879589	879589	879589	879589	879589	879589	879589	879589
Duplicate	-	-	-	Primary	Intra-Laboratory	Inter-Laboratory	-	-	-	-	-	-	-	-	-
Material Description	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Silty SAND	Sandy SILT	SAND	Silty SAND	Gravelly SAND	Clayey SILT/ Silty CLAY	Silty CLAY	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY

Analyte		Unit	LOR														
Nutrients																	
	Nitrate & Nitrite (as N)	mg/kg	5	3.3	3	3.3	3.3	11	3.1	2.3	1.1	5.8	< 1	20	4.2	3.7	33	18
	Nitrate	mg/kg	1	3.2	2.8	3.2	3.2	11	3.1	2.2	< 1	5.6	< 1	20	3.5	2.9	32	18
	Phosphorus	mg/kg	5	160	170	120	84	95	106	280	1900	110	50	210	110	120	100	95
	Total Kjeldahl Nitrogen (as N)	mg/kg	10	450	260	220	550	450	510	550	41	890	32	460	500	460	430	370
	Total Nitrogen (as N)*	mg/kg	10	450	260	220	550	460	510	550	42	900	32	480	500	460	460	390
Cations and Anions																	
	Calcium	mg/kg	5.0	4900	14000	21000	25000	25000	37700	69000	27000	32000	8100	3200	30000	20000	24000	7500
	Magnesium	mg/kg	5	9500	4900	6000	5900	5900	5520	5900	3100	4300	2200	20000	7700	7500	6100	6800
	Chloride	mg/kg	5	12	160	100	< 10	< 10	<10	< 10	1300	< 10	11	14000	46	21	4900	6100
	Sulphate (as SO4)	mg/kg	10	< 10	15	40	< 10	< 10	<10	< 10	43	< 10	< 10	2300	31	16	89	100
Other Metals																	
	Iron	mg/kg	20	38000	25000	47000	33000	33000	35000	31000	16000	30000	15000	35000	49000	48000	33000	43000
	Manganese	mg/kg	20	690	520	720	560	550	404	730	410	560	480	440	1300	1000	1000	720
General Parameters																	
	% Moisture	%	1	2.5	5.6	5.6	7.7	6.7	6.7	4.6	< 1	4.3	< 1	9.4	6.1	5.8	6.7	5.7
	Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10	60	360	210	100	100	176	90	1,100	110	90	11,000	120	120	3,400	4,200
	pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.3	9.9	9.3	8.9	8.9	8.9	9	9.1	8.7	8.7	8.7	9	8.9	9	8.5
	Cation Exchange Capacity	meq/100g	0.05	16	25	26	31	32	39.4	26	19	24	14	92	31	30	52	47
	Total Organic Carbon	%	0.05	0.56	0.14	0.14	0.33	0.4	0.42	0.45	0.11	0.75	<0.05	0.58	0.46	0.41	0.42	0.37
Exchangeable																	
	Exchangeable Acidicity	cmolc/kg	0.1	0.5	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Exchangeable Calcium	cmolc/kg	0.2	13	19	22	24	25	33.9	21	13	20	13	20	24	24	29	20
	Exchangeable Magnesium	cmolc/kg	0.2	1.9	1.8	2.4	5.3	5.5	4.2	3.6	2.8	2.7	0.6	11	6	4.9	3	7.2
	Exchangeable Potassium	cmolc/kg	0.05	0.72	0.53	0.42	1.1	1.3	1	1.2	< 0.2	0.94	< 0.2	2.8	0.43	0.74	0.96	0.64
	Exchangeable Sodium	cmolc/kg	0.2	0.3	3.6	0.7	0.2	0.2	0.3	< 0.2	3.4	< 0.2	< 0.2	58	0.5	0.3	19	19

Table 3 - Summary of Analytical Results - P2 - Surface Samples

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Field ID	SS206	SS207	SS208	SS209	SS210	SS211	SS212	SS213	SS214	SS215	SS216	SS217
Date	30/03/2022	30/03/2022	30/03/2022	29/03/2022	30/03/2022	30/03/2022	29/03/2022	30/03/2022	30/03/2022	29/03/2022	29/03/2022	30/03/2022
Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
Laboratory Report	879589	879589	879589	879589	879589	879589	879589	879589	879589	879589	879589	879589
Duplicate	-	-	-	-	-	-	-	-	-	-	-	-
Material Description	Silty SAND	Sandy SILT	Sandy GRAVEL	Silty CLAY	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Sandy SILT	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY	Clayey SILT/ Silty CLAY
Analyte	**Unit**	**LOR**											
Nutrients													
Nitrate & Nitrite (as N)	mg/kg	5	2.8	8.8	14	2.7	4.8	10	5.3	4.9	5.8	2.8	3.3	< 1
Nitrate	mg/kg	1	2.7	8.7	14	2	4.5	10	4.6	4	5.3	2.4	2.3	< 1
Phosphorus	mg/kg	5	120	130	130	110	90	120	280	130	75	96	94	200
Total Kjeldahl Nitrogen (as N)	mg/kg	10	370	270	730	650	220	230	430	620	240	520	330	100
Total Nitrogen (as N)*	mg/kg	10	370	280	740	650	220	240	440	620	250	520	330	100
Cations and Anions														
Calcium	mg/kg	5.0	2200	890	1200	29000	8600	2600	22000	8200	3900	14000	14000	4100
Magnesium	mg/kg	5	6100	4400	3900	6900	5000	5900	7000	7100	5500	6800	8200	14000
Chloride	mg/kg	5	< 10	4500	15	87	38	5100	< 10	14	1400	170	11	24000
Sulphate (as SO4)	mg/kg	10	< 10	400	11	< 10	22	150	< 10	< 10	13	< 10	< 10	1400
Other Metals														
Iron	mg/kg	20	39000	41000	42000	43000	35000	55000	40000	48000	42000	47000	54000	49000
Manganese	mg/kg	20	600	1100	660	830	550	740	1700	670	660	730	2300	830
General Parameters														
% Moisture	%	1	7.1	10	6	5.1	5.5	6	3.8	4.9	4.3	3.9	6	20
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	10	50	<10	40	190	130	3,400	110	120	1,000	250	120	12,000
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	8.1	7.2	6.9	9	9.1	7.6	8.8	8.4	8.4	9.2	9	8.5
Cation Exchange Capacity	meq/100g	0.05	8.1	31	8.1	31	22	25	24	20	22	28	29	100
Total Organic Carbon	%	0.05	0.37	0.27	0.58	0.46	0.15	0.17	0.43	0.57	0.27	0.39	0.33	0.34
Exchangeable														
Exchangeable Acidicity	cmolc/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	cmolc/kg	0.2	5.9	5.6	4.1	22	18	6.8	20	16	13	20	20	10
Exchangeable Magnesium	cmolc/kg	0.2	1.8	8.2	3.3	7.3	3.1	9	2.8	3.2	4.1	5.8	7.6	23
Exchangeable Potassium	cmolc/kg	0.05	0.43	0.56	0.74	0.74	0.32	0.53	1.4	0.74	0.52	0.62	0.74	4.4
Exchangeable Sodium	cmolc/kg	0.2	< 0.2	17	< 0.2	1	0.5	9.1	< 0.2	< 0.2	4.3	1.4	0.7	64

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Strength (N, Si, M, St, E)	AASS	PASS		
												High	Medium	Low
Test pit samples														
829635	TP059_0	ASS1_0_19.8.21_TP059	19.8.21	0.00	soil	CI: CLAY: medium plasticity, red brown; with sand, fine to coarse grained; with gravel, fine to medium grained, subangular of quartz and dolerite (Residual Soil)	8.9	8.3	0.6	Extreme	No			X
829635	TP059_0.5	ASS2_0.5_19.8.21_TP059	19.8.21	0.50	soil	CI: SANDY CLAY: medium plasticity, red brown; sand, fine to coarse grained; trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Residual Soil)	9.7	9.7	0.0	Extreme	No			X
829635	TP059_3	ASS9_3_19.8.21_TP059	19.8.21	3.33	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand is fine to coarse grained; trace to with fine to medium grained gravel sized lithorelicts of quartz and granite; with cobble sized lithorelicts of extremely to highly weathered granite. (Residual Soil)	10.0	10.0	0.0	Extreme	No			X
829635	TP060_0	ASS1_0_19.8.21_TP060	19.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown; sand, fine to coarse grained, trace fine to coarse grained gravel sized lithorelicts of granite, dolerite and quartz. (Residual Soil)	7.7	8.1	-0.4	Extreme	No			X
829635	TP060_2.5	ASS7_2.5_19.8.21_TP060	19.8.21	2.50	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown; sand, fine to coarse grained, trace fine to coarse grained gravel sized lithorelicts of granite, dolerite and quartz. (Residual Soil)	9.6	9.7	-0.1	Extreme	No			X
829635	TP058_0	ASS1_0_20.8.21_TP058	20.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.0	7.6	1.4	Extreme	No			X
829635	TP058_3	ASS7_3_20.8.21_TP058	20.8.21	3.33	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, pale yellowish brown mottled cream; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite	10.0	11.0	-1.0	Extreme	No			X
829635	TP057_0	ASS1_0_20.8.21_TP057	20.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.3	-0.1	Extreme	No			X
829635	TP057_3	ASS7_3_20.8.21_TP057	20.8.21	3.33	soil	CI: CLAY: medium plasticity, pale red brown, mottled cream and pinkish brown, trace to with sand, fine to coarse grained, with cobble sized lithorelicts of extremely to highly weathered granite and quartz. (Residual Soil)	10.0	10.0	0.0	Extreme	No			X
829635	TP068_0	ASS1_0_21.8.21_TP068	21.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.6	9.5	0.1	Extreme	No			X
829635	TP068_2.1	ASS5_2.1_21.8.21_TP068	21.8.21	2.10	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, pale yellowish brown mottled pale orangish brown and cream; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite	9.9	10.0	-0.1	Extreme	No			X
829635	TP069_0	ASS1_0_21.8.21_TP069	21.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.8	8.7	0.1	Extreme	No			X
829635	TP069_2.4	ASS6_2.4_21.8.21_TP069	21.8.21	2.40	soil	SC: CLAYEY SAND: fine to coarse grained, pale yellowish brown mottled cream and pale red brown; clay, medium plasticity; with gravel, fine to coarse grained, subangular; trace to with cobbles, subangular, gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.8	10.0	-0.2	Extreme	No			X
829635	TP061_0	ASS1_0_21.8.21_TP061	21.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.0	9.1	-0.1	Extreme	No			X
829635	TP061_2	ASS5_2_21.8.21_TP061	21.8.21	2.22	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale yellowish brown mottled cream and orange brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.1	9.2	-0.1	Extreme	No			X
829635	TP062_0	ASS1_0_21.8.21_TP062	21.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.3	-0.2	Extreme	No			X
829635	TP062_3	ASS7_3_21.8.21_TP062	21.8.21	3.33	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale yellowish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.9	10.0	-0.1	Extreme	No			X
829635	TP063_0	ASS1_0_21.8.21_TP063	21.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.0	9.4	-0.4	Extreme	No			X
829635	TP063_2.7	ASS7_2.7_21.8.21_TP063	21.8.21	2.70	soil	GC: GRAVEL: fine to coarse grained, sub angular, dark yellowish brown mottled cream and red brown, extremely to highly weathered lithorelicts of granite; with sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular. (XW - HW Granite)	10.0	10.0	0.0	Extreme	No			X
829635	TP064_0	ASS1_0_21.8.21_TP064	21.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	8.8	0.4	Extreme	No			X
829635	TP064_2	ASS5_2_21.8.21_TP064	21.8.21	2.22	soil	METASEDIMENT: fine grained; dark pinkish brown mottled cream; low to medium strength; highly weathered (recovered as SANDY GRAVEL). (Metasediment)	9.5	9.7	-0.2	Extreme	No			X
829635	TP071_0	ASS1_0_22.8.21_TP071	22.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. Interbedded with CLAY with sand. (Residual Soil	9.0	9.4	-0.4	Extreme	No			X
829635	TP071_2.3	ASS6_2.3_22.8.21_TP071	22.8.21	2.30	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale reddish brown mottled cream ; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.4	9.4	0.0	Extreme	No			X
829635	TP072_0	ASS1_0_22.8.21_TP072	22.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.5	9.5	0.0	Extreme	No			X
829635	TP072_2.3	ASS6_2.3_22.8.21_TP072	22.8.21	2.30	soil	C: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled cream; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.3	9.1	0.2	Extreme	No			X
829635	TP073_0	ASS1_0_22.8.21_TP073	22.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil	9.4	9.8	-0.4	Extreme	No			X
829635	TP073_2.1	ASS5_2.1_22.8.21_TP073	22.8.21	2.10	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled cream; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.5	9.6	-0.1	Extreme	No			X
829635	TP065_0	ASS1_0_22.8.21_TP065	22.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.6	9.9	-0.3	Extreme	No			X
829635	TP065_2.2	ASS6_2.2_22.8.21_TP065	22.8.21	2.20	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained, trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Residual Soil)	9.1	9.0	0.1	Extreme	No			X
829635	TP066_0	ASS1_0_22.8.21_TP066	22.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.0	8.8	0.2	Extreme	No			X
829635	TP066_3	ASS7_3_22.8.21_TP066	22.8.21	3.33	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale yellowish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.9	10.0	-0.1	Extreme	No			X
829635	TP067_0	ASS1_0_22.8.21_TP067	22.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil	9.4	9.5	-0.1	Extreme	No			X
829635	TP067_2	ASS5_2_22.8.21_TP067	22.8.21	2.22	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained, trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite. (Residual Soil)	9.9	8.9	1.0	Extreme	No			X
829635	TP079_0	ASS1_0_23.8.21_TP079	23.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	8.6	0.7	Extreme	No			X
829635	TP075_0	ASS1_0_23.8.21_TP075	23.8.21	0.00	soil	CL - CI: SANDY CLAY: low to medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil	9.4	7.6	1.8	Extreme	No			X
829635	TP075_1.5	ASS4_1.5_23.8.21_TP075	23.8.21	1.50	soil	GC: CLAYEY GRAVEL: fine to coarse grained, sub angular, pale pinkish brown mottled cream, low to medium plasticity; with sand, fine to coarse grained; with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite	9.7	7.1	2.6	Extreme	No			X
829635	TP076_0	ASS1_0_23.8.21_TP076	23.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.0	7.6	1.4	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Strength (N, Sl, M, St, E)	AASS	PASS		
												High	Medium	Low
829635	TP076_2.4	ASS6_2.4_23.8.21_TP076	23.8.21	2.40	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale yellowish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite	9.8	9.9	-0.1	Extreme	No			X
829635	TP077_0	ASS1_0_23.8.21_TP077	23.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.9	9.0	-0.1	Extreme	No			X
829635	TP077_2	ASS5_2_23.8.21_TP077	23.8.21	2.22	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, pale grey mottled cream and pale yellow; sand, fine to coarse grained, with clay, medium plasticity, with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite	9.5	9.7	-0.2	Extreme	No			X
829635	TP078_0	ASS1_0_23.8.21_TP078	23.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil	9.3	9.4	-0.1	Extreme	No			X
829635	TP078_3	ASS7_3_23.8.21_TP078	23.8.21	3.33	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale yellowish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular. Gravel and cobbles	8.4	8.8	-0.4	Extreme	No			X
829635	TP070_0	ASS1_0_23.8.21_TP070	23.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, subangular to subrounded of quartz, granite and dolerite (Alluvial soil)	8.7	7.7	1.0	Extreme	No			X
829635	TP070_3	ASS7_3_23.8.21_TP070	23.8.21	3.33	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular, pale grey and cream mottled pale orange and pale red,; sand, fine to coarse grained; trace to with clay, medium plasticity, with cobbles, subangular. Gravel and cobbles are extremely to highly weather lithorelicts of granite. (Residual Soil	9.6	9.8	-0.2	Extreme	No			X
829635	TP074_0	ASS1_0_24.8.21_TP074	24.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil	9.1	9.1	0.0	Extreme	No			X
829635	TP074_1.8	ASS4_1.8_23.8.21_TP074	23.8.21	1.80	soil	GC: SANDY GRAVEL: fine grained; dark pinkish brown mottled cream; low to medium strength; highly weathered (recovered as SANDY GRAVEL). (Metasediment)	9.7	9.8	-0.1	Extreme	No			X
829635	TP055_0	ASS1_0_25.8.21_TP055	25.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.1	0.1	Extreme	No			X
829635	TP055_0	ASS2_0_25.8.21_TP055	25.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	8.6	0.5	Extreme	No			X
829635	TP055_1.5	ASS4_1.5_25.8.21_TP055	25.8.21	1.50	soil	METASEDIMENT: fine grained; dark pinkish brown mottled cream; low to medium strength; highly weathered (recovered as SANDY GRAVEL). (Metasediment	8.9	9.3	-0.4	Extreme	No			X
829635	TP054_0	ASS1_0_25.8.21_TP054	25.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.0	9.4	-0.4	Extreme	No			X
829635	TP054_2.1	ASS2_2.1_25.8.21_TP054	25.8.21	2.10	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale brown mottled cream and pale red; gravel, fine to coarse grained, subangular, clay, medium plasticity; with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite	9.3	9.7	-0.4	Extreme	No			X
829635	TP052_2.4	ASS2_2.4_25.8.21_TP052	25.8.21	2.40	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale orange brown mottled cream and pale red; gravel, fine to coarse grained, subangular; clay, medium plasticity. Gravel is extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.9	10.0	-0.1	Extreme	No			X
829635	TP051_0	ASS1_0_25.8.21_TP051	25.8.21	0.00	soil	CL - CI: SANDY CLAY: low to medium plasticity, pale orange brown; sand is fine to coarse grained; with gravel, fine grained, subangular to subrounded (Alluvial soil)	9.4	9.4	0.0	Extreme	No			X
829635	TP051_0	ASS2_0_25.8.21_TP051	25.8.21	0.00	soil	CL - CI: SANDY CLAY: low to medium plasticity, pale orange brown; sand is fine to coarse grained; with gravel, fine grained, subangular to subrounded (Alluvial soil)	9.4	9.9	-0.5	Extreme	No			X
829635	TP042_2.2	ASS2_2.2_25.8.21_TP042	25.8.21	2.20	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale yellowish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.8	10.0	-0.2	Extreme	No			X
829635	TP041_0	ASS1_0_25.8.21_TP041	25.8.21	0.00	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil	8.9	9.4	-0.5	Extreme	No			X
829635	TP041_3	ASS2_3_25.8.21_TP041	25.8.21	3.33	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale grey mottled cream and pale brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; gravels are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.9	9.8	0.1	Extreme	No			X
829368	TP195_0	ASS1_0_21.9.21_TP195	21.9.21	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	8.7	8.4	0.3	Extreme	No			X
829368	TP195_1.8	ASS2_1.8_21.9.21_TP195	21.9.21	1.8	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale grey brown mottled orange with dark grey; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded to angular, gravel and cobbles are highly weathered lithorelicts of granite. (XW - HW Granite	8.9	8.7	0.2	Extreme	No			X
829368	TP194_0	ASS1_0_21.9.21_TP194	21.9.21	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	9.1	9.2	-0.1	Extreme	No			X
829368	TP194_1.65	ASS2_1.65_21.9.21_TP194	21.9.21	1.6	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale yellowish brown mottled red grey; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are distinctly weathered lithorelicts of granite. (XW - HW Granite) Test pit terminated at 1.65 m	9	8.9	0.1	Extreme	No			X
829368	TP193_0	ASS1_0_21.9.21_TP193	21.9.21	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	9	8.7	0.3	Extreme	No			X
829368	TP193_2.2	ASS2_2.2_21.9.21_TP193	21.9.21	2.2	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, dark brown mottled pale grey; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are highly to distinctly weathered lithorelicts of granite. (XW - HW Granite	8.6	8.5	0.1	Moderate	No			X
829368	TP192_0	ASS1_0_21.9.21_TP192	21.9.21	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)	9	8.5	0.5	Moderate	No			X
829368	TP192_1.7	ASS2_1.7_21.9.21_TP192	21.9.21	1.7	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)	9.8	9.7	0.1	Moderate	No			X
829368	TP212_0	ASS1_0_21.9.21_TP212	21.9.21	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)	9.1	9.2	-0.1	Extreme	No			X
829368	TP212_1.45	ASS2_1.45_21.9.21_TP212	21.9.21	1.4	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale grey brown mottled yellow; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are highly to distinctly weathered lithorelicts of granite. (XW - HW Granite)	9.1	9.5	-0.4	Extreme	No			X
829368	TP213_0	ASS1_0_21.9.21_TP213	21.9.21	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)	9.2	9.2	0	Extreme	No			X
829368	TP213_1.5	ASS2_1.5_21.9.21_TP213	21.9.21	1.5	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale grey brown mottled yellowish cream; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are highly weathered lithorelicts of granite. (XW - HW Granite	9.4	9.7	-0.3	Extreme	No			X
829368	TP214_0	ASS1_0_21.9.21_TP214	21.9.21	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	9.2	9.2	0	Extreme	No			X
829368	TP214_2	ASS2_2_21.9.21_TP214	21.9.21	2	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale grey brown mottled yellowish cream; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are moderately weathered lithorelicts of granite. (XW - HW Granite)	9.9	11	-1.1	Extreme	No			X
829368	TP215_0	ASS1_0_21.9.21_TP215	21.9.21	0	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale grey brown mottled red; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite	9.4	9.3	0.1	Extreme	No			X
829368	TP215_1.2	ASS2_1.2_21.9.21_TP215	21.9.21	1.2	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale grey brown mottled red; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite	9.5	9.6	-0.1	Extreme	No			X
829368	TP216_0	ASS1_0_21.9.21_TP216	21.9.21	0	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale grey brown mottled red; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite	9.6	9.6	0	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Strength (N, Si, M, St, E)	AASS	PASS		
												High	Medium	Low
829368	TP216_1.75	ASS2_1.75_21.9.21_TP216	21.9.21	1.7	soil	GC: SANDY GRAVEL: medium to coarse grained, subrounded, pale grey brown mottled orange; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded to angular, gravel and cobbles are moderately weathered lithorelicts of granite. (XW - HW Granite)	9.3	9.3	0	Extreme	No			X
829368	TP217_0	ASS1_0_21.9.21_TP217	21.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	9.3	9	0.3	Extreme	No			X
829368	TP217_1.95	ASS2_1.95_21.9.21_TP217	21.9.21	1.9	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, red grey mottled orange and pale grey; sand, fine to coarse grained, subangular; gravel, fine to coarse grained, subangular; trace cobbles, subrounded; gravel and cobbles are extremely weathered litherolicts of granite. (XW - HW Granite	7.6	8.9	-1.3	Extreme	No			X
829368	TP001_0	ASS1_0_22.9.21_TP001	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite; with rootlets; (Residual Soil	9.5	9.4	0.1	Extreme	No			X
829368	TP001_1.8	ASS2_1.8_22.9.21_TP001	22.9.21	1.8	soil	GC: SANDY GRAVEL: fine to coarse grained, subrounded, pale grey brown mottled red orange; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded, gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite	9.4	9.5	-0.1	Extreme	No			X
829368	TP204_0	ASS1_0_22.9.21_TP204	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Alluvial soil	8.3	7.5	0.8	Extreme	No			X
829368	TP204_2.5	ASS2_2.5_22.9.21_TP204	22.9.21	2.5	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, subrounded to angular, pale grey brown mottled red; sand, fine to coarse grained; clay	9.5	9.7	-0.2	Extreme	No			X
829368	TP205_0	ASS1_0_22.9.21_TP205	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; trace grass rootlets; (Alluvial soil	7.8	5.7	2.1	Extreme	No			X
829368	TP205_2.3	ASS2_2.3_22.9.21_TP205	22.9.21	2.3	soil	GC: GRAVEL: fine to coarse grained, subrounded to angular, pale grey brown mottled; with sand, fine to coarse grained; trace clay, medium to high plasticity (Alluvial soil)	7.6	7.8	-0.2	Extreme	No			X
829368	TP206_0	ASS1_0_22.9.21_TP206	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil	9	8.9	0.1	Extreme	No			X
829368	TP206_1.8	ASS2_1.8_22.9.21_TP206	22.9.21	1.8	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil	8.9	9.3	-0.4	Extreme	No			X
829368	TP207_0	ASS1_0_22.9.21_TP207	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil	7.9	8.2	-0.3	Extreme	No			X
829368	TP207_1.7	ASS2_1.7_22.9.21_TP207	22.9.21	1.7	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, brown red mottled pale grey; sand, fine to coarse grained, subangular, trace cobbles, subrounded; gravel and cobbles are	8	8.5	-0.5	Extreme	No			X
829368	TP208_0	ASS1_0_22.9.21_TP208	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	8.9	8.5	0.4	Extreme	No			X
829368	TP208_1.4	ASS2_1.4_22.9.21_TP208	22.9.21	1.4	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, dark brown mottled grey; gravel, fine to medium grained, subangular, clay, medium plasticity; trace to with cobbles, subrounded; gravel and cobbles are highly weathered lithorelicts of granite. (XW - HW Granite)	8.5	8.5	0	Extreme	No			X
829368	TP196_0	ASS1_0_22.9.21_TP196	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quarts, granite and dolerite; with grass rootlets; (Residual Soil)	9	9	0	Extreme	No			X
829368	TP196_2	ASS2_2_22.9.21_TP196	22.9.21	2	soil	GC: SANDY GRAVEL: medium to coarse grained, subrounded, pale grey brown mottled orange; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subrounded to angular, gravel and cobbles are highly weathered lithorelicts of granite. (XW - HW Granite	8.8	9	-0.2	Extreme	No			X
829368	TP209_0	ASS1_0_22.9.21_TP209	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil	9.3	9	0.3	Extreme	No			X
829368	TP209_1.65	ASS2_1.65_22.9.21_TP209	22.9.21	1.6	soil	GC: SANDY GRAVEL: medium to coarse grained, subrounded, pale grey brown mottled yellowish cream; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular to rounded, gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite)	9.3	9.1	0.2	Extreme	No			X
829368	TP210_0	ASS1_0_22.9.21_TP210	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil	9	8.9	0.1	Extreme	No			X
829368	TP210_1.9	ASS2_1.9_22.9.21_TP210	22.9.21	1.9	soil	GC: SANDY GRAVEL: medium to coarse grained, subrounded, pale grey brown mottled orange; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular to rounded, gravel and cobbles are distinctly weathered lithorelicts of granite. (XW - HW Granite	9.3	8.7	0.6	Extreme	No			X
829368	TP211_0	ASS1_0_22.9.21_TP211	22.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil	8.7	8.8	-0.1	Extreme	No			X
829368	TP211_2.3	ASS2_2.3_22.9.21_TP211	22.9.21	2.3	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, red brown mottled pale grey; sand, fine to coarse grained, subangular, with gravel fine to coarse grained, subangular, with cobbles, subrounded; gravel and cobbles are extremely to highly weathered litherolicts of granite. (XW - HW Granite	8.5	8.7	-0.2	Extreme	No			X
829368	TP284_0	ASS1_0_23.9.21_TP284	23.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained; with to trace gravel, fine to coarse grained, subangular to subrounded, comprising quartz, granite and dolerite. (Residual Soil	8	8.1	-0.1	Extreme	No			X
829368	TP284_3.1	ASS2_3.1_23.9.21_TP284	23.9.21	3.1	soil	Cl - CH: GRAVELLY CLAY: medium to high plasticity, pale yellowish brown mottled cream and pale brown; with sand, fine to coarse grained; gravel, fine to coarse grained; subangular; trace cobbles, subangular; gravel and cobbles comprise XW to HW lithorelicts of granite. (XW - HW Granite	9.5	9.5	0	Extreme	No			X
829368	TP115_0	ASS1_0_23.9.21_TP115	23.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; (Residual Soil)	9.2	7.6	1.6	Extreme	No			X
829368	TP115_2.3	ASS2_2_23.9.21_TP115	23.9.21	2	soil	GC: GRAVELLY SANDY CLAY: medium to high plasticity, brown red mottled green with pale grey; sand, fine to coarse grained, subangular, trace cobbles, subrounded; gravel and cobbles are extremely to highly weathered litherolicts of granite. (XW - HW Granite	9.4	8.8	0.6	Extreme	No			X
829368	TP122_0	ASS1_0_23.9.21_TP122	23.9.21	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	8.6	7.9	0.7	Extreme	No			X
829368	TP122_1.3	ASS2_1.3_23.9.21_TP122	23.9.21	1.3	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, brown red mottled pale grey; sand, fine to coarse grained, subangular, trace cobbles, subrounded; gravel and cobbles are extremely to highly weathered litherolicts of granite. (XW - HW Granite)	9	8.9	0.1	Extreme	No			X
829537	TP199_0	ASS1_0_20.9.21_TP199	20/09/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; (Residual Soil)	8.8	8.8	0	Extreme	No			X
829537	TP199-2.8	ASS2_2.8_20.9.21_TP199	20/09/2021	2.8	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, subrounded to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, gravel and cobbles are moderately weathered; (Alluvial soil) ... at 2.00m, with cobbles, moderately weathered lithorelicts of granite;	8.4	8.9	-0.5	Extreme	No			X
829537	TP200_0	ASS1_0_20.9.21_TP200	20/09/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; (Alluvial soil)	7.9	7.1	0.8	Extreme	No			X
829537	TP200_2	ASS2_2_20.9.21_TP200	20/09/2021	2	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, subrounded to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, subrounded. (Alluvial soil)	8.5	8.8	-0.3	Extreme	No			X
829537	TP201_0	ASS1_0_20.9.21_TP201	20/09/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; (Alluvial soil)	7.4	5	2.4	Extreme	No			X
829537	TP201_1.4	ASS2_1.4_20.9.21_TP201	20/09/2021	1.4	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular to subrounded, red brown mottled orange and dark grey; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite)	8.1	8.1	0	Extreme	No			X
829537	TP202_0	ASS1_0_20.9.21_TP202	20/09/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	8.9	9.1	-0.2	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Strength (N, Si, M, St, E)	AASS	PASS		
												High	Medium	Low
829537	TP202_2.1	ASS2_2.1_20.9.21_TP202	20/09/2021	2.1	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, red brown mottled grey; sand, fine to coarse grained, subangular, trace cobbles, subrounded; gravel and cobbles are extremely to highly weathered litherolicts of granite. (XW - HW Granite) ... at 2.00m, with cobbles, highly to moderately weathered lithorelicts of granite;	8.6	8.9	-0.3	Extreme	No			X
829537	TP203_0	ASS1_0_20.9.21_TP203	20/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; with grass rootlets; (Alluvial soil)	9	9.1	-0.1	Extreme	No			X
829537	TP203_2	ASS2_2_20.9.21_TP203	20/09/2021	2	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, pale grey mottled cream and pale red brown; sand, fine to coarse grained, subangular, trace cobbles, subrounded; gravel and cobbles are extremely to highly weathered litherolicts of granite. (XW - HW Granite)	8.9	9.1	-0.2	Extreme	No			X
829534	TP038_0	ASS1_0_26.8.21_TP038	26/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.6	10	-0.4	Extreme	No			X
829534	TP038_1	ASS2_1.8_26.8.21_TP038	26/08/2021	1.8	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale grey brown mottled cream; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	10	10	0	Extreme	No			X
829534	TP039_0	ASS1_0_26.8.21_TP039	26/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.6	10	-0.4	Extreme	No			X
829534	TP039_2	ASS2_2.1_26.8.21_TP039	26/08/2021	2.1	soil	GC: CLAYEY SAND/GRAVEL/GRAVELLY SAND : gravel, fine to coarse grained, subangular, dark orange brown mottled cream and pale red; clay, medium plasticity, trace to with cobbles, subangular; Gravel and cobbles are of highly to moderately weathered granite. (XW - HW Granite)	10	10	0	Extreme	No			X
829534	TP040_0	ASS1_0_26.8.21_TP040	26/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quarts, granite and dolerite. (Residual Soil)	9.2	9.1	0.1	Extreme	No			X
829534	TP040_2	ASS2_2.1_26.8.21_TP040	26/08/2021	2.1	soil	GC: CLAYEY SAND/GRAVEL/GRAVELLY SAND: gravel, fine to coarse grained, subangular, dark orange brown mottled cream and pale red; clay, medium plasticity, trace to with cobbles, subangular; Gravel and cobbles are of highly to moderately weathered granite. (XW - HW Granite)	10	10	0	Extreme	No			X
829534	TP044_0	ASS1_0_26.8.21_TP044	26/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.7	9.8	-0.1	Extreme	No			X
829534	TP044_2	ASS2_2.6_26.8.21_TP044	26/08/2021	2.6	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale grey mottled cream and pale brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	10	11	-1	Extreme	No			X
829534	TP050_0	ASS1_0_26.8.21_TP050	26/08/2021	0	soil	CL - CI: SANDY CLAY: low to medium plasticity, pale orange brown; sand is fine to coarse grained; with gravel, fine grained, subangular to subrounded (Alluvial soil)	9.6	9.7	-0.1	Extreme	No			X
829534	TP050_2	ASS2_2_26.8.21_TP050	26/08/2021	2	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale grey mottled cream and pale red; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.4	9.5	-0.1	Extreme	No			X
829534	TP043_0	ASS1_0_26.8.21_TP043	26/08/2021	0	soil	CL - CI: SANDY CLAY: low to medium plasticity, pale orange brown; sand is fine to coarse grained; with gravel, fine grained, subangular to subrounded (Alluvial soil)	9.4	9.5	-0.1	Extreme	No			X
829534	TP043_3	ASS2_3_26.8.21_TP043	26/08/2021	3	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale grey mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	10	10	0	Extreme	No			X
829534	TP036_0	ASS1_0_27.8.21_TP036	27/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.9	9.8	0.1	Extreme	No			X
829534	TP037_0	ASS1_0_27.8.21_TP037	27/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.4	9.6	-0.2	Extreme	No			X
829534	TP037_3	ASS2_3_27.8.21_TP037	27/08/2021	3	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale red brown mottled cream; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.7	10	-0.3	Extreme	No			X
829534	TP046_0	ASS1_0_27.8.21_TP046	27/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, with gravel, fine to medium grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.1	0.1	Extreme	No			X
829534	TP046_1	ASS2_1.3_27.8.21_TP046	27/08/2021	1.3	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, dark orange brown mottled cream and grey; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.6	9.5	0.1	Extreme	No			X
829534	TP047_0	ASS1_0_27.8.21_TP047	27/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	9.3	9.7	-0.4	Extreme	No			X
829534	TP047_2	ASS2_2_27.8.21_TP047	27/08/2021	2	soil	METASEDIMENT: fine grained; dark pinkish brown mottled cream; low to medium strength; highly weathered (recovered as Sandy GRAVEL). (Metasediment)	10	10	0	Extreme	No			X
829534	TP036_0	ASS4_0_27.8.21_TP036	27/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9	0.3	Extreme	No			X
829534	TP080_0	ASS1_0_29.8.21_TP080	29/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9	0.1	Extreme	No			X
829534	TP080_2	ASS2_2.2_29.8.21_TP080	29/08/2021	2.2	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular; pale yellowish mottled cream; sand, fine to medium grained; with clay, medium plasticity; with cobbles, subangular; Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	8.9	8.3	0.6	Extreme	No			X
829534	TP081_0	ASS1_0_29.8.21_TP081	29/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.8	7.6	1.2	Extreme	No			X
829534	TP081_2	ASS2_2.3_29.8.21_TP081	29/08/2021	2.3	soil	CI: CLAY: medium plasticity, red brown, trace sand, fine to coarse grained; trace to with fine to medium grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Residual Soil)	9.7	9.2	0.5	Extreme	No			X
829534	TP085_0	ASS1_0_29.8.21_TP085	29/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.1	0.1	Extreme	No			X
829534	TP085_2	ASS4_2.6_29.8.21_TP085	29/08/2021	2.6	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, pale yellowish brown mottled cream; sand, fine to coarse grained, with clay, medium plasticity, trace cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.9	10	-0.1	Extreme	No			X
829534	TP086_0	ASS1_0_29.8.21_TP086	29/08/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.3	-0.1	Extreme	No			X
829534	TP086_1	ASS2_1.6_29.8.21_TP086	29/08/2021	1.6	soil	CI: CLAY: medium plasticity, cream mottled red brown; with sand fine to coarse grained; with cobbles, subangular; trace gravel. Gravel and cobbles are of extremely to moderately weathered granite. (XW - HW Granite)	9.6	9.7	-0.1	Extreme	No			X
829534	TP087_0	ASS1_0_29.8.21_TP087	29/08/2021	0	soil	CI: CLAY: medium plasticity, red brown, mottled pale brown and cream; with sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	9	8.3	0.7	Extreme	No			X
829534	TP087_1	ASS4_1.6_29.8.21_TP087	29/08/2021	1.6	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; with fine to medium grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz; weakly cemented. (Residual Soil)	8.8	8.9	-0.1	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Strength (N, Sl, M, St, E)	AASS	PASS		
												High	Medium	Low
829534	TP090_0	ASS1_0_29.8.21_TP090	29/08/2021	0	soil	Cl: CLAY: medium plasticity, red brown, mottled pale brown and cream; trace sand, fine to coarse grained, trace gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.1	0.1	Extreme	No			X
829534	TP090_2	ASS2_2.2_29.8.21_TP090	29/08/2021	2.2	soil	Cl: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; with fine to medium grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Residual Soil)	8.8	9.4	-0.6	Extreme	No			X
829534	TP092_0	ASS1_0_29.8.21_TP092	29/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.8	-0.6	Extreme	No			X
829534	TP092_2	ASS2_2.2_29.8.21_TP092	29/08/2021	2.2	soil	GC: SANDY GRAVEL: fine to coarse grained; subangular' cream mottled red brown; sand, fine to coarse grained; with clay, medium plasticity; with cobbles, subangular. Gravel and cobbles are of extremely to moderately weathered granite (XW - HW Granite)	9.7	9.8	-0.1	Extreme	No			X
829534	TP095_0	ASS1_0_29.8.21_TP095	29/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.3	-0.2	Extreme	No			X
829534	TP095_1	ASS2_1.9_29.8.21_TP095	29/08/2021	1.9	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular, pale yellowish brown mottled cream; sand, fine to coarse grained; trace to with clay, medium plasticity; with cobbles subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.3	9.2	0.1	Extreme	No			X
829534	TP096_0	ASS1_0_29.8.21_TP096	29/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.4	9.5	-0.1	Extreme	No			X
829534	TP096_2	ASS2_2_29.8.21_TP096	29/08/2021	2	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular, pale yellowish brown mottled cream; sand, fine to coarse grained; trace to with clay, medium plasticity; with cobbles subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.6	9.8	-0.2	Extreme	No			X
829534	TP085_0	ASS2_0_29.8.21_TP085	29/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9	9.1	-0.1	Extreme	No			X
829534	TP087_0	ASS2_0_29.8.21_TP087	29/08/2021	0	soil	Cl: CLAY: medium plasticity, red brown, mottled pale brown and cream; with sand, fine to coarse grained, trace gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	9	8.5	0.5	Extreme	No			X
829534	TP082_0	ASS1_0_31.8.21_TP082	31/08/2021	0	soil	CL - Cl: SANDY CLAY: low to medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.2	0.1	Extreme	No			X
829534	TP082_2	ASS4_2.4_31.8.21_TP082	31/08/2021	2.4	soil	CL - Cl: SANDY CLAY: low to medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9	9.1	-0.1	Extreme	No			X
829534	TP083_0	ASS1_0_31.8.21_TP083	31/08/2021	0	soil	CL - Cl: SANDY CLAY: low to medium plasticity, red brown, mottled pale brown and cream; sand, fine grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	7.7	7	0.7	Extreme	No			X
829534	TP083_1	ASS2_1.5_31.8.21_TP083	31/08/2021	1.5	soil	CL - Cl: SANDY CLAY: low to medium plasticity, red brown, mottled pale brown and cream; sand, fine grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.4	-0.3	Extreme	No			X
829534	TP145_0	ASS1_0_31.8.21_TP145	31/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.3	0	Extreme	No			X
829534	TP145_1	ASS2_1.7_31.8.21_TP145	31/08/2021	1.7	soil	GC: SANDY CLAYEY GRAVEL: fine to coarse grained, angular, pale red brown; sand, fine to coarse grained; clay, low plasticity; weakly to moderately cemented. (Calcrete)	9.8	9.8	0	Extreme	No			X
829534	TP186_0	ASS1_0_31.8.21_TP186	31/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.6	-0.4	Extreme	No			X
829534	TP186_2	ASS2_2_31.8.21_TP186	31/08/2021	2	soil	GC: CLAYEY GRAVEL: fine to coarse grained, angular to subangular; pale grey brown; clay, medium plasticity; trace cobbles, subangular; gravel and cobbles are extremely to moderately weathered granite. (XW - HW Granite)	10	11	-1	Extreme	No			X
829534	TP187_0	ASS1_0_31.8.21_TP187	31/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.5	9.6	-0.1	Extreme	No			X
829534	TP187_2	ASS2_2.1_31.8.21_TP187	31/08/2021	2.1	soil	GC: CLAYEY GRAVEL: fine to coarse grained, subangular pale yellowish brown mottled cream and pale red brown; with sand, fine to coarse grained; clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely weathered granite. (XW - HW Granite)	9.3	9.3	0	Extreme	No			X
829534	TP188_0	ASS1_0_31.8.21_TP188	31/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.6	9.6	0	Extreme	No			X
829534	TP188_2	ASS2_2.4_31.8.21_TP188	31/08/2021	2.4	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, yellow, cream and brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.8	9.4	0.4	Extreme	No			X
829534	TP189_0	ASS1_0_31.8.21_TP189	31/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	8.8	0.5	Extreme	No			X
829534	TP189_1	ASS4_1.5_31.8.21_TP189	31/08/2021	1.5	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular; pale red brown; sand, fine to coarse grained; with clay, medium plasticity; gravel is extremely to highly weathered lithorelicts of granite, dolerite, quartz and calcrete. (XW - HW Granite)	9.7	9.6	0.1	Extreme	No			X
829534	TP190_0	ASS1_0_31.8.21_TP190	31/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.4	-0.3	Extreme	No			X
829534	TP190_2	ASS2_2.3_31.8.21_TP190	31/08/2021	2.3	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale yellowish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium to high plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.4	9.3	0.1	Extreme	No			X
829534	TP082_0	ASS2_0_31.8.21_TP082	31/08/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.5	-0.2	Extreme	No			X
829534	TP185_0	ASS1_0_01.9.21_TP185	1/09/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9	0.1	Extreme	No			X
829534	TP185_2	ASS2_2.7_01.9.21_TP185	1/09/2021	2.7	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular, pale yellowish brown mottled cream; sand fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.6	8.1	1.5	Extreme	No			X
829534	TP191_0	ASS1_0_01.9.21_TP191	1/09/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, with gravel, fine to coarse grained, subangular to subrounded, or quartz, granite and dolerite. (Residual Soil)	9	9	0	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{OX}	pH_F - pH_{OX}	Reaction Strength (N, Sl, M, St, E)	AASS	PASS		
												High	Medium	Low
829534	TP191_2	ASS4_2.4_01.9.21_TP191	1/09/2021	2.4	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular, pale yellowish brown mottled cream; sand, fine to coarse grained, with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	7	9.1	-2.1	Extreme	No			X
829534	TP191_0	ASS2_0_01.9.21_TP191	1/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, with gravel, fine to coarse grained, subangular to subrounded, or quartz, granite and dolerite. (Residual Soil)	9.2	9.2	0	Extreme	No			X
829534	TP008_0	ASS1_0_06.9.21_TP008	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.3	0	Extreme	No			X
829534	TP008_2	ASS2_2.1_06.9.21_TP008	6/09/2021	2.1	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, pale reddish brown mottled cream and pale red brown; sand, fine to coarse grained, subangular, trace cobbles, subangular; gravel and cobbles are extremely to highly weathered litherolicts of dolerite. (XW Dolerite)	9.3	9.1	0.2	Extreme	No			X
829534	TP007_0	ASS1_0_06.9.21_TP007	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.5	9.3	0.2	Extreme	No			X
829534	TP007_1	ASS2_1.9_06.9.21_TP007	6/09/2021	1.9	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to moderately weathered lithorelicts of basalt/dolerite. (Residual Soil/ XW Dolerite)	9.5	9.2	0.3	Extreme	No			X
829534	TP006_0	ASS1_0_06.9.21_TP006	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, subangular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.9	9.1	-0.2	Extreme	No			X
829534	TP006_2	ASS2_2.1_06.9.21_TP006	6/09/2021	2.1	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to moderately weathered lithorelicts of basalt/dolerite; cemented. (Residual Soil/ XW Dolerite)	8.4	8.8	-0.4	Extreme	No			X
829534	TP005_0	ASS1_0_06.9.21_TP005	6/09/2021	0	soil	GC: SANDY GRAVEL: fine to coarse grained;' subrounded to rounded; red brown; sand, fine to coarse grained; with clay; medium plasticity; gravel and cobbles, rounded; gravel and cobbles are of dolerite. (Alluvial soil)	8.7	9	-0.3	Extreme	No			X
829534	TP005_0	ASS2_0.5_06.9.21_TP005	6/09/2021	0.5	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; trace fine gravel sized lithorelicts of extremely to distinctly weathered dolerite. (Alluvial soil)	8.9	8.7	0.2	Extreme	No			X
829534	TP005_1	ASS3_1_06.9.21_TP005	6/09/2021	1	soil	GC: SANDY GRAVEL: fine to coarse gravel, subrounded to rounded, red brown; sand, fine to coarse grained; with clay, medium plasticity; with cobbles, subrounded to rounded; weakly cemented; gravel and cobbles are of highly to moderately weathered dolerite. (Alluvial soil)	7.8	9.3	-1.5	Extreme	No			X
829534	TP005_1	ASS4_1.5_06.9.21_TP005	6/09/2021	1.5	soil	GC: CLAYEY GRAVEL: fine to coarse gravel, subrounded to rounded, red brown, medium to high plasticity; with sand, fine to coarse grained; with cobbles, subrounded to rounded; weakly cemented; gravel and cobbles are of highly to moderately weathered dolerite. (Residual Soil)	9.4	9.4	0	Extreme	No			X
829534	TP005_2	ASS5_2_06.9.21_TP005	6/09/2021	2	soil	GC: SANDY GRAVEL: fine to coarse gravel, subrounded to rounded, red brown; sand, fine to coarse grained; with clay, medium plasticity; with cobbles, subrounded to rounded; weakly cemented; gravel and cobbles are of highly to moderately weathered dolerite. (Alluvial soil)	9.6	9.5	0.1	Extreme	No			X
829534	TP005_2	ASS6_2.5_06.9.21_TP005	6/09/2021	2.5	soil	GC: SANDY GRAVEL: fine to coarse gravel, subrounded to rounded, red brown; sand, fine to coarse grained; with clay, medium plasticity; with cobbles, subrounded to rounded; weakly cemented; gravel and cobbles are of highly to moderately weathered dolerite. (Alluvial soil)	9.3	9.6	-0.3	Extreme	No			X
829534	TP163_0	ASS1_0_06.9.21_TP163	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.5	-0.4	Extreme	No			X
829534	TP163_1	ASS2_1.5_06.9.21_TP163	6/09/2021	1.5	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled cream; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	8.9	8.7	0.2	Extreme	No			X
829534	TP164_0	ASS1_0_06.9.21_TP164	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9	0.3	Extreme	No			X
829534	TP164_2	ASS2_2.6_06.9.21_TP164	6/09/2021	2.6	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quart. (Residual Soil)	9	8.6	0.4	Extreme	No			X
829534	TP169_0	ASS1_0_06.9.21_TP169	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	8.1	9.2	-1.1	Extreme	No			X
829534	TP169_2	ASS4_2_06.9.21_TP169	6/09/2021	2	soil	GC: CLAYEY GRAVEL: fine to coarse grained, subangular to rounded, pale reddish brown mottled bluish grey and cream; clay, medium plasticity; trace sand, fine to coarse grained; with cobbles, subrounded to rounded. Gravel and cobbles are of dolerite (Alluvial soil)	8.5	8.7	-0.2	Extreme	No			X
829534	TP165_0	ASS1_0_06.9.21_TP165	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.2	0.1	Extreme	No			X
829534	TP165_3	ASS2_3_06.9.21_TP165	6/09/2021	3	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale reddish brown mottled cream and pale orange; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.1	9	0.1	Extreme	No			X
829534	TP153_0	ASS1_0_06.9.21_TP153	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.4	-0.3	Extreme	No			X
829534	TP153_2	ASS2_2_06.9.21_TP153	6/09/2021	2	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, dark yellowish brown mottled cream and dark red; sand, fine to coarse grained, with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	8.9	8.9	0	Extreme	No			X
829534	TP005_2	ASS7_2.5_06.9.21_TP005	6/09/2021	2.5	soil	GC: SANDY GRAVEL: fine to coarse gravel, subrounded to rounded, red brown; sand, fine to coarse grained; with clay, medium plasticity; with cobbles, subrounded to rounded; weakly cemented; gravel and cobbles are of highly to moderately weathered dolerite. (Alluvial soil)	9.3	9.4	-0.1	Extreme	No			X
829534	TP169_0	ASS2_0_06.9.21_TP169	6/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	8.4	9.1	-0.7	Extreme	No			X
829534	TP154_0	ASS1_0_07.9.21_TP154	7/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quarts, granite and dolerite. (Residual Soil)	9.3	9.7	-0.4	Extreme	No			X
829534	TP154_2	ASS2_2_07.9.21_TP154	7/09/2021	2	soil	GC: CLAYEY GRAVEL: fine to coarse grained, pale greyish brown mottled cream and pale red brown, subangular; clay, low plasticity; trace sand, trace to with cobbles, subangular; gravel and cobbles are extremely to moderately weathered lithorelicts of granite. (XW - HW Granite)	9.4	9.3	0.1	Extreme	No			X
829534	TP155_0	ASS1_0_07.9.21_TP155	7/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.8	9	-0.2	Extreme	No			X
829534	TP155_3	ASS2_3_07.9.21_TP155	7/09/2021	3	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to moderately weathered lithorelicts of dolerite. (Residual Soil/ XW Dolerite)	9.4	9.1	0.3	Extreme	No			X
829534	TP156_0	ASS1_0_07.9.21_TP156	7/09/2021	0	soil	GC: SANDY GRAVEL: fine to coarse grained;' subrounded to rounded; red brown; sand, fine to coarse grained; with clay; medium plasticity; gravel and cobbles, rounded; gravel and cobbles are of dolerite. (Alluvial soil)	9.5	9.8	-0.3	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Strength (N, Si, M, St, E)	AASS	PASS		
												High	Medium	Low
829534	TP156_1	ASS2_1.8_07.9.21_TP156	7/09/2021	1.8	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to moderately weathered lithorelicts of dolerite. (Residual Soil/ XW Dolerite)	9.4	9.4	0	Extreme	No			X
829534	TP157_0	ASS1_0_07.9.21_TP157	7/09/2021	0	soil	GC: SANDY GRAVEL: fine to coarse grained;' subrounded to rounded; red brown; sand, fine to coarse grained; with clay; medium plasticity; gravel and cobbles, rounded; gravel and cobbles are of dolerite. (Alluvial soil)	8.1	9.1	-1	Extreme	No			X
829534	TP157_0	ASS2_0.5_07.9.21_TP157	7/09/2021	0.5	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Alluvial soil)	8.8	9.1	-0.3	Extreme	No			X
829534	TP157_1	ASS3_1_07.9.21_TP157	7/09/2021	1	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, sub rounded to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, gravel and cobbles are moderately weathered, subrounded to rounded. (Alluvial soil)	9.1	9.2	-0.1	Extreme	No			X
829534	TP157_1	ASS4_1.5_07.9.21_TP157	7/09/2021	1.5	soil	GC: GRAVEL: fine to coarse grained, sub rounded to rounded, red brown mottled dark grey; with sand, fine to coarse grained; with clay, medium plasticity with cobbles, gravel and cobbles are moderately weathered, subrounded to rounded. (Alluvial soil)	9.1	9.5	-0.4	Extreme	No			X
829534	TP157_2	ASS5_2_07.9.21_TP157	7/09/2021	2	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, sub rounded to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, gravel and cobbles are moderately weathered, subrounded to rounded. (Alluvial soil)	9.2	9.4	-0.2	Extreme	No			X
829534	TP157_2	ASS6_2.5_07.9.21_TP157	7/09/2021	2.5	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, sub rounded to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, gravel and cobbles are moderately weathered, subrounded to rounded. (Alluvial soil)	9.1	9.5	-0.4	Extreme	No			X
829534	TP157_2	ASS7_2.8_07.9.21_TP157	7/09/2021	2.8	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to moderately weathered lithorelicts of dolerite. (XW Granite)	9.6	9.5	0.1	Extreme	No			X
829534	TP158_0	ASS1_0_07.9.21_TP158	7/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	8	8.5	-0.5	Extreme	No			X
829534	TP158_0	ASS2_0.5_07.9.21_TP158	7/09/2021	0.5	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	8.7	8.7	0	Extreme	No			X
829534	TP158_1	ASS3_1_07.9.21_TP158	7/09/2021	1	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, subangular to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, subrounded to rounded. (Alluvial soil)	9.6	9.3	0.3	Extreme	No			X
829534	TP158_1	ASS4_1.2_07.9.21_TP158	7/09/2021	1.2	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, subangular to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, subrounded to rounded. (Alluvial soil)	9.5	9.3	0.2	Extreme	No			X
829534	TP159_0	ASS1_0_07.9.21_TP159	7/09/2021	0	soil	GC: SANDY GRAVEL: fine to coarse grained;' subrounded to rounded; red brown; sand, fine to coarse grained; with clay; medium plasticity; gravel and cobbles, rounded; gravel and cobbles are of dolerite. (Alluvial soil)	8.2	8.9	-0.7	Extreme	No			X
829534	TP159_0	ASS2_0.5_07.9.21_TP159	7/09/2021	0.5	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	8.8	8.9	-0.1	Extreme	No			X
829534	TP159_1	ASS3_1_07.9.21_TP159	7/09/2021	1	soil	CI: CLAY: medium plasticity, brown, trace to with sand, fine to coarse grained; trace gravel; of dolerite. (Alluvial soil)	7.8	8.8	-1	Extreme	No			X
829534	TP159_1	ASS4_1.5_07.9.21_TP159	7/09/2021	1.5	soil	CI: CLAY: medium plasticity, brown, trace to with sand, fine to coarse grained; trace gravel; of dolerite. (Alluvial soil)	7.8	8.8	-1	Extreme	No			X
829534	TP159_2	ASS5_2_07.9.21_TP159	7/09/2021	2	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, subangular to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, subangular to rounded. Occasionally with sand (Alluvial soil)	9	9.1	-0.1	Extreme	No			X
829534	TP159_2	ASS6_2.4_07.9.21_TP159	7/09/2021	2.4	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, subangular to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, subangular to rounded. Occasionally with sand (Alluvial soil)	9.1	9.4	-0.3	Extreme	No			X
829534	TP160_0	ASS1_0_07.9.21_TP160	7/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.2	0.1	Extreme	No			X
829534	TP160_2	ASS2_2.1_07.9.21_TP160	7/09/2021	2.1	soil	CI: CLAY: medium plasticity, brown, trace to with sand, fine to coarse grained; trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Residual Soil)	8.7	8.7	0	Extreme	No			X
829534	TP009_0	ASS1_0_07.9.21_TP009	7/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.2	9.3	-0.1	Extreme	No			X
829534	TP009_2	ASS2_2.1_07.9.21_TP009	7/09/2021	2.1	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale reddish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of dolerite. (Residual Soil/ XW Dolerite)	9.2	8.9	0.3	Extreme	No			X
829534	TP010_0	ASS1_0_07.9.21_TP010	7/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.4	-0.3	Extreme	No			X
829534	TP010_1	ASS2_1.9_07.9.21_TP010	7/09/2021	1.9	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale reddish brown mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of dolerite. (Residual Soil/ XW Dolerite)	9.6	9.9	-0.3	Extreme	No			X
829534	TP011_0	ASS1_0_07.9.21_TP011	7/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.7	9.3	-0.6	Extreme	No			X
829534	TP011_1	ASS2_1.7_07.9.21_TP011	7/09/2021	1.7	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale reddish brown mottled cream and pale orange; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of dolerite. (Residual Soil/ XW Dolerite)	9.9	10	-0.1	Extreme	No			X
829534	TP182_0	ASS1_0_09.9.21_TP182	9/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.6	9.6	0	Extreme	No			X
829534	TP182_1	ASS2_1.2_09.9.21_TP182	9/09/2021	1.2	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Residual Soil)	9.5	9.7	-0.2	Extreme	No			X
829534	TP180_0	ASS1_0_09.9.21_TP180	9/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.4	9.4	0	Extreme	No			X
829534	TP180_2	ASS2_2.8_09.9.21_TP180	9/09/2021	2.8	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Residual Soil) ... from 2.40m to 2.80m, with fine to coarse gravel sized lithorelicts of extremely to highly weathered granite	8.9	8.7	0.2	Extreme	No			X
829534	TP168_0	ASS1_0_09.9.21_TP168	9/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.6	9.6	0	Extreme	No			X
829534	TP168_1	ASS2_1.7_09.9.21_TP168	9/09/2021	1.7	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale brownish grey mottled dark red and dark orange; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; cobbles are extremely to moderately weathered calcarenite. (XW - HW Granite)	8.9	8.9	0	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Strength (N, Si, M, St, E)	AASS	PASS		
												High	Medium	Low
829534	TP152_0	ASS1_0_09.9.21_TP152	9/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.2	-0.1	Extreme	No			X
829534	TP152_2	ASS2_2.1_09.9.21_TP152	9/09/2021	2.1	soil	GC: GRAVEL: fine to coarse grained, sub angular, pale yellowish brown mottled cream; with sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of calcarenite. (XW - HW Calcarenite)	8.5	8.5	0	Extreme	No			X
829534	TP162__	ASS1`_0_09.9.21_TP162	9/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown; sand, fine to medium grained; trace gravel, fine grained, subangular. (Residual Soil)	9.3	9.5	-0.2	Extreme	No			X
829534	TP162_1	ASS2_1.4_09.9.21_TP162	9/09/2021	1.4	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, greyish brown mottled cream and dark orange; gravel, fine to coarse grained, subangular; clay, medium plasticity; with cobbles. Gravel and cobbles comprise HW to MW lithorelicts of granite. (XW - HW Granite)	9.5	9.5	0	Extreme	No			X
829534	TP151_0	ASS1_0_09.9.21_TP151	9/09/2021	0	soil	CI - CH: SANDY CLAY: medium to high plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.4	9.1	0.3	Extreme	No			X
829534	TP151_1	ASS2_1.4_09.9.21_TP151	9/09/2021	1.4	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale orange brown mottled cream; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of dolerite. (XW - HW Granite)	9.8	10	-0.2	Extreme	No			X
829534	TP167_0	ASS1_0_10.9.21_TP167	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.3	-0.2	Extreme	No			X
829534	TP167_2	ASS2_2.1_10.9.21_TP167	10/09/2021	2.1	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, yellowish brown mottled pale grey and dark red; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.7	10	-0.3	Extreme	No			X
829534	TP181_0	ASS1_0_10.9.21_TP181	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.7	9.8	-0.1	Extreme	No			X
829534	TP181_2	ASS4_2.3_10.9.21_TP181	10/09/2021	2.3	soil	GC: GRAVEL: fine to coarse grained, pale pinkish brown mottled pale grey and dark red; with sand, fine to coarse grained, subangular; with clay, medium to high plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered dolerite. (Residual Soil/ XW Dolerite)	9.4	9.8	-0.4	Extreme	No			X
829534	TP183_0	ASS1_0_10.9.21_TP183	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.5	8.7	-0.2	Extreme	No			X
829534	TP183_1	ASS2_1.8_10.9.21_TP183	10/09/2021	1.8	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale greyish brown mottled pale grey and dark orange; gravel, fine to coarse grained, subangular, clay, medium plasticity; with cobbles, subangular; gravel and cobbles are extremely to highly weathered dolerite. (Residual Soil/ XW Dolerite)	9.3	9.3	0	Extreme	No			X
829534	TP184_0	ASS1_0_10.9.21_TP184	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.4	-0.1	Extreme	No			X
829534	TP184_1	ASS2_1.5_10.9.21_TP184	10/09/2021	1.5	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, dark orange brown mottled pale yellow and pale grey; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered dolerite. (Residual Soil/ XW Dolerite)	9.1	9.1	0	Extreme	No			X
829534	TP147__	ASS1`_0_10.9.21_TP147	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	9.4	9.3	0.1	Extreme	No			X
829534	TP147_1	ASS2_1.3_10.9.21_TP147	10/09/2021	1.3	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; trace fine grained gravel sized lithorelicts	9.7	9.8	-0.1	Extreme	No			X
829534	TP148_0	ASS1_0_10.9.21_TP148	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	9.2	-0.1	Extreme	No			X
829534	TP148_1	ASS2_1.7_10.9.21_TP148	10/09/2021	1.7	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled dark orange; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	8.8	9	-0.2	Extreme	No			X
829534	TP149_0	ASS1_0_10.9.21_TP149	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.4	9.5	-0.1	Extreme	No			X
829534	TP149_2	ASS2_2.1_10.9.21_TP149	10/09/2021	2.1	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pinkish mottled pale grey and dark orange; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.3	9.3	0	Extreme	No			X
829534	TP150_0	ASS1_0_10.9.21_TP150	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.3	8.3	0	Extreme	No			X
829534	TP150_1	ASS2_1.3_10.9.21_TP150	10/09/2021	1.3	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale greyish brown mottled dark red and pale orange; gravel, fine to coarse grained, subangular, clay, medium plasticity; with cobbles, subangular; gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite)	9.8	9.7	0.1	Extreme	No			X
829534	TP135_0	ASS1_0_10.9.21_TP135	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.3	0	Extreme	No			X
829534	TP135_0	ASS2_0.9_10.9.21_TP135	10/09/2021	0.9	soil	GRANITE: coarse grained; pale grey mottled pale orange, dark grey and yellow, low to medium strength; highly to moderately weathered. (HW - MW Granite)	9.6	9.6	0	Extreme	No			X
829534	TP134_0	ASS1_0_10.9.21_TP134	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.3	9.5	-0.2	Extreme	No			X
829534	TP134_1	ASS2_1.8_10.9.21_TP134	10/09/2021	1.8	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale grey mottled dark orange and pale yellow; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular. Gravel and cobbles are extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.8	10	-0.2	Extreme	No			X
829534	TP133_0	ASS1_0_10.9.21_TP133	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.4	9.4	0	Extreme	No			X
829534	TP133_2	ASS2_2.2_10.9.21_TP133	10/09/2021	2.2	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale greyish brown mottled cream; gravel, fine to coarse grained, subangular, clay, medium plasticity; with cobbles, subangular. Gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite)	9.9	9.8	0.1	Extreme	No			X
829534	TP181_0	ASS2_0_10.9.21_TP181	10/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.7	9.6	0.1	Extreme	No			X
829534	TP132_0	ASS1_0_11.9.21_TP132	11/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9	9.2	-0.2	Extreme	No			X
829534	TP132_1	ASS2_1.6_11.9.21_TP132	11/09/2021	1.6	soil	CI - CH: CLAY: medium to high plasticity, brown, trace to with sand, fine to coarse grained; with fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz; trace cobbles sized lithorelicts of extremely to highly weathered granite. (Residual Soil)	9.2	9	0.2	Extreme	No			X
829534	TP131_0	ASS1_0_11.9.21_TP131	11/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.1	8.7	0.4	Extreme	No			X
829534	TP131_1	ASS2_1_11.9.21_TP131	11/09/2021	1	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale greyish brown mottled cream; clay, medium plasticity; trace cobbles, subangular; with gravel and trace cobble sized lithorelicts of extremely to moderately weathered dolerite and calcrete. (Residual Soil/ XW Dolerite)	9.1	8.6	0.5	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

							Field Screening Tests							
												PASS		
Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	pH_F	pH_{OX}	pH_F - pH_{OX}	Reaction Strength (N, Sl, M, St, E)	AASS	High	Medium	Low
829534	TP130_0	ASS1_0_11.9.21_TP130	11/09/2021	0	soil	Cl: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	9.1	9.1	0	Extreme	No			X
829534	TP130_0	ASS2_0.5_11.9.21_TP130	11/09/2021	0.5	soil	CI - CH: GRAVELLY CLAY: medium to high plasticity, red brown, trace to with sand, fine to coarse grained; gravel of extremely to distinctly weathered granite and quartz. (Alluvial soil)	8.7	9	-0.3	Extreme	No			X
829534	TP130_1	ASS3_1_11.9.21_TP130	11/09/2021	1	soil	CI - CH: GRAVELLY CLAY: medium to high plasticity, red brown, trace to with sand, fine to coarse grained; gravel of extremely to distinctly weathered granite and quartz. (Alluvial soil)	9	8.8	0.2	Extreme	No			X
829534	TP130_1	ASS4_1.5_11.9.21_TP130	11/09/2021	1.5	soil	CI - CH: GRAVELLY CLAY: medium to high plasticity, red brown, trace to with sand, fine to coarse grained; gravel of extremely to distinctly weathered granite and quartz. (Alluvial soil)	8.8	9.1	-0.3	Extreme	No			X
829534	TP130_2	ASS5_2_11.9.21_TP130	11/09/2021	2	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, subrounded to rounded, pale greyish brown mottled cream and dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles. Gravel and cobbles are highly to moderately weathered dolerite, subangular to rounded. (Alluvial soil)	9.3	9.5	-0.2	Extreme	No			X
829534	TP012_0	ASS1_0_11.9.21_TP012	11/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Alluvial soil)	9.1	9.3	-0.2	Extreme	No			X
829534	TP012_3	ASS2_3_11.9.21_TP012	11/09/2021	3	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; trace to with fine grained gravel sized lithorelicts of extremely weathered dolerite. (Residual Soil)	8.8	9.3	-0.5	Extreme	No			X
829534	TP013_0	ASS1_0_11.9.21_TP013	11/09/2021	0	soil	CI - CH: SANDY CLAY: medium to high plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	9.6	9.7	-0.1	Extreme	No			X
829534	TP013_0	ASS2_0.7_11.9.21_TP013	11/09/2021	0.7	soil	GRANITE: coarse grained; pale grey mottled dark grey and pale orange, low to medium strength; highly to moderately weathered. (HW - MW Granite)	9.5	9.9	-0.4	Extreme	No			X
829534	TP014_0	ASS1_0_11.9.21_TP014	11/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace gravel, fine grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.8	8.8	0	Extreme	No			X
829534	TP014_0	ASS2_0.9_11.9.21_TP014	11/09/2021	0.9	soil	GRANITE: coarse grained; pale grey mottled dark red and pale orange, low to medium strength; highly to moderately weathered. (HW - MW Granite)	9.5	9.3	0.2	Extreme	No			X
829534	TP015_0	ASS1_0_11.9.21_TP015	11/09/2021	0	soil	SM: SILTY SAND: fine to medium grained, orange brown, non-plastic; trace to with gravel, fine to medium grained, subrounded to rounded, of granite and dolerite (Eolian soil)	9.4	8.5	0.9	Extreme	No			X
829534	TP015_0	ASS2_0.5_11.9.21_TP015	11/09/2021	0.5	soil	SM: SILTY SAND: fine to medium grained, orange brown, non-plastic; trace to with gravel, fine to medium grained, subrounded to rounded, of granite and dolerite (Eolian soil)	9.8	9.7	0.1	Extreme	No			X
829534	TP015_1	ASS3_1_11.9.21_TP015	11/09/2021	1	soil	SM: SILTY SAND: fine to medium grained, orange brown, non-plastic; trace to with gravel, fine to medium grained, subrounded to rounded, of granite and dolerite (Eolian soil)	9.6	9.5	0.1	Extreme	No			X
829534	TP015_1	ASS4_1.5_11.9.21_TP015	11/09/2021	1.5	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale pinkish brown mottled dark grey and cream; gravel, fine to coarse grained, subangular, clay, medium plasticity; gravel is extremely to highly weathered lithorelicts of granite. (XW - HW Granite)	9.7	9.5	0.2	Extreme	No			X
829534	TP016_0	ASS1_0_11.9.21_TP016	11/09/2021	0	soil	SP-SC: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular; trace to with clay, medium plasticity. (Eolian soil)	9.6	9.3	0.3	Extreme	No			X
829534	TP016_0	ASS2_0.5_11.9.21_TP016	11/09/2021	0.5	soil	SP-SC: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular; trace to with clay, medium plasticity. (Eolian soil)	9.9	10	-0.1	Extreme	No			X
829534	TP016_1	ASS3_1.1_11.9.21_TP016	11/09/2021	1.1	soil	SP-SC: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular; trace to with clay, medium plasticity. (Eolian soil)	9.7	9.5	0.2	Extreme	No			X
829534	TP016_2	ASS4_2.6_11.9.21_TP016	11/09/2021	2.6	soil	CI: CLAY: medium plasticity, red brown, trace to with sand, fine to coarse grained; trace fine grained gravel sized lithorelicts of extremely to distinctly weathered granite and quartz. (Residual Soil)	9.5	9.6	-0.1	Extreme	No			X
829534	TP017_0	ASS1_0_11.9.21_TP017	11/09/2021	0	soil	SP: SAND: fine to medium grained, red brown; with gravel, fine to medium grained, subangular; trace clay, medium plasticity. (Alluvial soil)	8.9	8.8	0.1	Extreme	No			X
829534	TP017_0	ASS2_0.8_11.9.21_TP017	11/09/2021	0.8	soil	SP-SC: GRAVELLY SAND: fine to coarse grained, sub angular, brownish grey mottled yellow and dark orange; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are of extremely to highly weathered dolerite. (Residual Soil/ XW Dolerite)	9.6	9.3	0.3	Extreme	No			X
829534	TP018_0	ASS1_0_11.9.21_TP018	11/09/2021	0	soil	SP: SAND: fine to medium grained, red brown; trace to with gravel, fine to medium grained, subangular; trace clay, medium plasticity. (Eolian soil)	9	7.9	1.1	Extreme	No			X
829534	TP018_3	ASS2_3_11.9.21_TP018	11/09/2021	3	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, dark yellow mottled pale grey and dark red; sand, fine to coarse grained, subangular, trace cobbles, subangular; gravel and cobbles are extremely to highly weathered lithorelicts of dolerite. Associated with Gravelly CLAY with sand. (Residual Soil/ XW Dolerite)	9.5	7.8	1.7	Extreme	No			X
829534	TP019_0	ASS1_0_12.9.21_TP019	12/09/2021	0	soil	SP: SAND: fine to medium grained, red brown; trace gravel, fine to medium grained, subangular; trace clay, medium plasticity. (Alluvial soil)	8.6	9.2	-0.6	Extreme	No			X
829534	TP019_2	ASS2_2.4_12.9.21_TP019	12/09/2021	2.4	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, dark yellow mottled pale grey and dark red; sand, fine to coarse grained, subangular, trace cobbles, subangular; gravel and cobbles are extremely to highly weathered lithrolicts of dolerite. (Residual Soil/ XW Dolerite)	9.5	8.3	1.2	Extreme	No			X
829534	TP020_0	ASS1_0_12.9.21_TP020	12/09/2021	0	soil	SM: SILTY SAND: fine to medium grained, orange brown, non-plastic; trace gravel, fine to medium grained, subangular. (Eolian soil)	9.3	7.9	1.4	Extreme	No			X
829534	TP020_3	ASS2_3.1_12.9.21_TP020	12/09/2021	3.1	soil	CI: SANDY CLAY: medium plasticity; dark red brown mottled cream; sand, fine to coarse grained; with fine to coarse gravel sized lithorelicts of extremely to highly weathered granite (Residual Soil)	9.5	8.1	1.4	Extreme	No			X
829534	TP021_0	ASS1_0_12.9.21_TP021	12/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	9.5	7.8	1.7	Extreme	No			X
829534	TP021_3	ASS2_3_12.9.21_TP021	12/09/2021	3	soil	SC: SANDY CLAY/ CLAYEY SAND: fine to medium grained; brown; clay, medium plasticity; trace fine to coarse gravel sized lithorelicts of extremely weathered granite (Residual Soil)	9.3	9.2	0.1	Extreme	No			X
829534	TP022_0	ASS1_0_12.9.21_TP022	12/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	9.9	8.6	1.3	Extreme	No			X
829534	TP022_3	ASS2_3_12.9.21_TP022	12/09/2021	3	soil	SC: SANDY CLAY/ CLAYEY SAND: fine to medium grained; brown; clay, medium plasticity; trace fine gravel sized lithorelicts of extremely weathered granite (XW Calcarenite) ... from 0.80m to 1.00m, with fine to coarse gravel sized fragments of extremely to highly weathered granite ... from 2.40m to 3.00m, mottled dark red brown and cream; with fine to coarse gravel and cobble sized lithorelicts of extremely to highly weathered granite	9.5	9.9	-0.4	Extreme	No			X
829534	TP024_0	ASS1_0_12.9.21_TP024	12/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	9.6	8.9	0.7	Extreme	No			X
829534	TP024_1	ASS2_1.7_12.9.21_TP024	12/09/2021	1.7	soil	CALCARENITE: fine to coarse grained; pale brownish yellow mottled orange and dark red brown; very low to low strength; highly to moderately weathered; trace whole gastropod shells. (<10mm) (HW - MW Calcarenite)	9.8	9.6	0.2	Extreme	No			X
829534	TP025_0	ASS1_0_12.9.21_TP025	12/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	9.7	9.5	0.2	Extreme	No			X
829534	TP025_3	ASS2_3_12.9.21_TP025	12/09/2021	3	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, dark yellow mottled dark red and pale orange; sand, fine to coarse grained, subangular, trace cobbles, subangular; gravel and cobbles are extremely to highly weathered litherolicts of dolerite. (Residual Soil/ XW Dolerite)	8.2	6.4	1.8	Extreme	No			X
829534	TP026_0	ASS1_0_12.9.21_TP026	12/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	8.7	9.1	-0.4	Extreme	No			X
829534	TP026_3	ASS2_3_12.9.21_TP026	12/09/2021	3	soil	SC: SANDY CLAY/ CLAYEY SAND: fine to medium grained; red brown mottled pale yellow and pale orange; clay, medium plasticity; trace to with fine gravel sized lithorelicts of extremely weathered rock. (Residual Soil)	9.6	9.7	-0.1	Extreme	No			X
829534	TP027_0	ASS1_0_12.9.21_TP027	12/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	9.2	9.3	-0.1	Extreme	No			X
829534	TP027_2	ASS2_2.8_12.9.21_TP027	12/09/2021	2.8	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, dark yellow mottled dark red and pale orange; sand, fine to coarse grained, subangular, trace cobbles, subangular; gravel and cobbles are extremely to highly weathered litherolicts of dolerite. (Residual Soil/ XW Dolerite)	9.5	9	0.5	Extreme	No			X
829534	TP028_0	ASS1_0_12.9.21_TP028	12/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	9.2	8.6	0.6	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	Field Screening Tests							
							pH_F	pH_{OX}	pH_F - pH_{OX}	Reaction Strength (N, Sl, M, St, E)	AASS	PASS		
												High	Medium	Low
829534	TP028_2	ASS2_2.1_12.9.21_TP028	12/09/2021	2.1	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, orange brown mottled cream and yellow; sand, fine to coarse grained, trace to with clay, medium plasticity, trace cobbles sized lithorelicts. (XW - HW Calcarenite)	9.8	9.7	0.1	Extreme	No			X
829534	TP029_0	ASS1_0_12.9.21_TP029	12/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	9.2	9.5	-0.3	Extreme	No			X
829534	TP029_1	ASS2_1.6_12.9.21_TP029	12/09/2021	1.6	soil	SC: SANDY CLAY/ CLAYEY SAND: fine to medium grained; red brown mottled pale yellow and pale orange; clay, medium plasticity; trace fine gravel sized lithorelicts of extremely weathered granite. (Residual Soil) ... from 1.30m to 1.60m, with fine to coarse gravel and cobble sized lithorelicts of extremely to highly weathered granite.	9.5	9.4	0.1	Extreme	No			X
829534	TP030_0	ASS1_0_13.9.21_TP030	13/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	8.4	7.4	1	Extreme	No			X
829534	TP030_1	ASS2_1.8_13.9.21_TP030	13/09/2021	1.8	soil	SC: SANDY CLAY/ CLAYEY SAND: fine to medium grained; red brown mottled pale yellow and pale orange; clay, medium plasticity; with fine gravel sized lithorelicts of extremely weathered beach rock. (Residual Soil) ... from 1.30m to 1.80m, cobble sized lithorelicts of highly to moderately weathered beach rock.	9.5	9.5	0	Extreme	No			X
829534	TP031_0	ASS1_0_13.9.21_TP031	13/09/2021	0	soil	SM: SILTY SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	8.3	6.3	2	Extreme	No			X
829534	TP031_1	ASS2_1.4_13.9.21_TP031	13/09/2021	1.4	soil	CI: SANDY CLAY: fine to medium grained; red brown mottled pale yellow; clay, medium plasticity; trace fine gravel sized lithorelicts of extremely weathered beach rock (Residual Soil) ... from 1.20m to 1.40m, with fine to coarse gravel, cobble and boulder sized lithorelicts of highly to moderately weathered beach rock; with whole shell fragments.	9.8	10	-0.2	Extreme	No			X
829534	TP032_0	ASS1_0_13.9.21_TP032	13/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular. (Eolian soil)	8.5	6.1	2.4	Extreme	No			X
829534	TP032_0	ASS2_0.9_13.9.21_TP032	13/09/2021	0.9	soil	SC: SANDY CLAY/ CLAYEY SAND: fine to medium grained; red brown mottled pale yellow; clay, medium plasticity; with fine gravel sized lithorelicts of extremely weathered beach rock. (Residual Soil) ... from 0.70m to 0.90m, with cobble sized lithorelicts of highly to moderately weathered beachrock.	9.6	9.1	0.5	Extreme	No			X
829534	TP033_0	ASS1_0_13.9.21_TP033	13/09/2021	0	soil	SP-SC: SAND: fine to medium grained, dark brown; trace gravel, fine to medium grained, subangular; trace to with clay, medium plasticity. (Eolian soil)	9.3	8.2	1.1	Extreme	No			X
829534	TP033_0	ASS2_0.8_13.9.21_TP033	13/09/2021	0.8	soil	SC: SANDY CLAY/ CLAYEY SAND: fine to medium grained; red brown mottled pale yellow; clay, medium plasticity; with fine to coarse gravel and cobble sized lithorelicts of extremely weathered beach rock. (Residual Soil)	9.6	9.1	0.5	Extreme	No			X
829534	TP274_0	ASS1_0_17.9.21_TP274	17/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular; trace clay, medium plasticity. (Eolian soil)	9.5	8.4	1.1	Extreme	No			X
829534	TP274_2	ASS2_2.3_17.9.21_TP274	17/09/2021	2.3	soil	SP-SC: GRAVELLY SAND: fine to medium grained, pale greenish grey mottled pale red and yellow; gravel, fine to medium grained, comprising extremely to highly weathered lithorelicts; with clay, medium plasticity. (XW Calcarenite)	10	8.2	1.8	Extreme	No			X
829534	TP275_0	ASS1_0_17.9.21_TP275	17/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular; trace clay, medium plasticity. (Eolian soil)	9.5	8.5	1	Extreme	No			X
829534	TP275_1	ASS2_1_17.9.21_TP275	17/09/2021	1	soil	DOLERITE: fine to medium grained, greyish green mottled cream and dark grey; low strength, highly weathered. Recovered as SANDY GRAVEL: fine to coarse grained, angular; sand, fine to coarse grained; with cobbles; trace clay, low plasticity. (Residual Soil/ XW Dolerite)	9.6	9.6	0	Extreme	No			X
829534	TP276_0	ASS1_0_17.9.21_TP276	17/09/2021	0	soil	SP: SAND: fine to medium grained, orange brown; trace gravel, fine to medium grained, subangular; trace clay, medium plasticity. (Eolian soil)	8.6	7.5	1.1	Extreme	No			X
829534	TP276_1	ASS2_1.5_17.9.21_TP276	17/09/2021	1.5	soil	DOLERITE: fine to medium grained, greyish green mottled cream and dark grey; low strength, highly weathered. Recovered as SANDY GRAVEL: fine to coarse grained, angular; sand, fine to coarse grained; with cobbles; trace clay, low plasticity. (Residual Soil/ XW Dolerite)	9.7	9.7	0	Extreme	No			X
829534	TP278_0	ASS1_0_17.9.21_TP278	17/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to coarse grained; with to trace gravel, fine to coarse grained, subangular to subrounded, comprising quartz, granite and dolerite. (Residual Soil)	9.3	8.8	0.5	Extreme	No			X
829534	TP278_2	ASS2_2_17.9.21_TP278	17/09/2021	2	soil	SC: CLAYEY GRAVELLY SAND : fine to coarse grained, pale red-brown mottled cream and dark grey; gravel, fine to coarse grained, subangular; clay, medium plasticity; with cobbles; gravel and cobbles comprise XW to HW lithorelicts of granite. (XW - HW Granite)	9.7	9.5	0.2	Extreme	No			X
829534	TP136_0	ASS1_0_18.9.21_TP136	18/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown; sand, fine to medium grained; trace gravel, fine to medium grained, subangular. (Residual Soil)	8.8	7.1	1.7	Extreme	No			X
829534	TP136_2	ASS2_2_18.9.21_TP136	18/09/2021	2	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale red brown mottled cream and dark grey; gravel, fine to coarse grained, subangular; clay, medium plasticity; with cobbles. Gravel and cobbles comprise XW to HW lithorelicts of granite. (XW - HW Granite)	9.7	9.3	0.4	Extreme	No			X
829534	TP137_0	ASS1_0_18.9.21_TP137	18/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown; sand, fine to medium grained; trace gravel, fine to medium grained, subangular. (Residual Soil)	9.2	8.5	0.7	Extreme	No			X
829534	TP137_2	ASS2_2.2_18.9.21_TP137	18/09/2021	2.2	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, orange brown mottled pale grey; gravel, fine to coarse grained, subangular; clay, medium plasticity; with cobbles. Gravel and cobbles comprise XW to HW lithorelicts of granite. (XW - HW Granite)	10	10	0	Extreme	No			X
829534	TP004_0	ASS1_0_19.9.21_TP004	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; (Alluvial soil)	8.7	8.7	0	Extreme	No			X
829534	TP004_2	ASS2_2.6_19.9.21_TP004	19/09/2021	2.6	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, sub rounded to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, gravel and cobbles are moderately weathered; (Alluvial soil)	8.9	9.1	-0.2	Extreme	No			X
829534	TP170_0	ASS1_0_19.9.21_TP170	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; (Residual Soil)	9	9.1	-0.1	Extreme	No			X
829534	TP170_2	ASS2_2.2_19.9.21_TP170	19/09/2021	2.2	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale grey mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subrounded; gravel and cobbles are highly weathered lithorelicts of granite. (XW - HW Granite)	8.9	9	-0.1	Extreme	No			X
829534	TP171_0	ASS1_0_19.9.21_TP171	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)	8.8	8.4	0.4	Extreme	No			X
829534	TP171_1	ASS2_1.4_19.9.21_TP171	19/09/2021	1.4	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, sub rounded to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, gravel and cobbles, subrounded. (Alluvial soil)	9.5	9.1	0.4	Extreme	No			X
829534	TP172_0	ASS1_0_19.9.21_TP172	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)	8.6	8.6	0	Extreme	No			X
829534	TP172_2	ASS2_2.5_19.9.21_TP172	19/09/2021	2.5	soil	GC: CLAYEY SANDY GRAVEL: fine to coarse grained, sub rounded to rounded, red brown mottled dark grey; sand, fine to coarse grained; clay, medium plasticity with cobbles, subrounded to rounded. (Alluvial soil)	8.5	8.8	-0.3	Extreme	No			X
829534	TP173_0	ASS1_0_19.9.21_TP173	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; (Residual Soil)	8.8	8.7	0.1	Extreme	No			X
829534	TP173_2	ASS2_2.4_19.9.21_TP173	19/09/2021	2.4	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, pale grey mottled cream and pale red brown; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular to rounded; gravel and cobbles are highly to distinctly weathered lithorelicts of granite. (XW - HW Granite)	8.8	8.8	0	Extreme	No			X
829534	TP174_0	ASS1_0_19.9.21_TP174	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)	8.8	8.7	0.1	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

							Field Screening Tests							
												PASS		
Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	pH_F	pH_{FOX}	pH_F - pH_{FOX}	Reaction Strength (N, Sl, M, St, E)	AASS	High	Medium	Low
829534	TP174_1	ASS2_1.6_19.9.21_TP174	19/09/2021	1.6	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, pale grey mottled cream and pale red brown; sand, fine to coarse grained, subangular, trace cobbles, subrounded; gravel and cobbles are extremely weathered litherolicts of granite. (XW - HW Granite)	8.3	8.7	-0.4	Extreme	No			X
829534	TP175_0	ASS1_0_19.9.21_TP175	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, sub angular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.7	9.1	-0.4	Extreme	No			X
829534	TP175_2	ASS2_2.1_19.9.21_TP175	19/09/2021	2.1	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, red brown mottled orange and pale grey; sand, fine to coarse grained, subangular, trace cobbles, subrounded; gravel and cobbles are highly weathered litherolicts of granite. (XW - HW Granite)	8.9	9.1	-0.2	Extreme	No			X
829534	TP176_0	ASS1_0_19.9.21_TP176	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite. (Residual Soil)	8.8	9.1	-0.3	Extreme	No			X
829534	TP176_1	ASS2_1.4_19.9.21_TP176	19/09/2021	1.4	soil	SC: CLAYEY GRAVELLY SAND: fine to coarse grained, red brown mottled grey and orange; gravel, fine to coarse grained, subangular, clay, medium plasticity; trace to with cobbles, subangular; gravel and cobbles are highly to distinctly weathered lithorelicts of granite. (XW - HW Granite)	8.8	9	-0.2	Extreme	No			X
829534	TP177_0	ASS1_0_19.9.21_TP177	19/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to coarse grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	9.1	9	0.1	Extreme	No			X
829534	TP177_2	ASS2_2.3_19.9.21_TP177	19/09/2021	2.3	soil	GC: GRAVELLY SANDY CLAY: medium plasticity, red brown mottled orange and pale grey; sand, fine to coarse grained, subangular, trace cobbles, subangular; gravel and cobbles are extremely weathered litherolicts of granite. (XW - HW Granite)	8.4	8.9	-0.5	Extreme	No			X
829534	TP002_0	ASS1_0_20.9.21_TP002	20/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subrounded, of quartz, granite and dolerite; with grass rootlets; (Alluvial soil)	9.2	9.1	0.1	Extreme	No			X
829534	TP002_1	ASS2_1.4_20.9.21_TP002	20/09/2021	1.4	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular to subrounded, pale yellowish brown mottled red grey; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular to rounded, gravel and cobbles are distinctly to moderately weathered lithorelicts of granite. (Distinctly Weathered Granite) ... at 1.30m, coarse grained gravels, moderately weathered;	8.7	9	-0.3	Extreme	No			X
829534	TP003_0	ASS1_0_20.9.21_TP003	20/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with rootlets; (Residual Soil)	8.8	8.9	-0.1	Extreme	No			X
829534	TP003_1	ASS2_1.9_20.9.21_TP003	20/09/2021	1.9	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, pale yellowish brown mottled cream; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are distinctly weathered lithorelicts of granite. (XW - HW Granite)	8.9	9.2	-0.3	Extreme	No			X
829534	TP178_0	ASS1_0_20.9.21_TP178	20/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; (Residual Soil)	8.8	8.8	0	Extreme	No			X
829534	TP178_1	ASS2_1.5_20.9.21_TP178	20/09/2021	1.5	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular, pale grey brown mottled orange and red; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are distinctly to moderately weathered lithorelicts of granite. (XW - HW Granite)	8.7	8.6	0.1	Extreme	No			X
829534	TP179_0	ASS1_0_20.9.21_TP179	20/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	9.3	9.3	0	Extreme	No			X
829534	TP179_1	ASS2_1.4_20.9.21_TP179	20/09/2021	1.4	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, pale yellowish brown mottled cream; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are highly to moderately weathered lithorelicts of granite. (XW - HW Granite) ... at 1.30m, Gravels are distinctly to moderately weathered lithorelicts of granite;	8.7	8.8	-0.1	Extreme	No			X
829534	TP197_0	ASS1_0_20.9.21_TP197	20/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to medium grained, trace to with gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; trace grass rootlets; (Residual Soil)	9	8.8	0.2	Extreme	No			X
829534	TP197_1	ASS2_1.7_20.9.21_TP197	20/09/2021	1.7	soil	GC: SANDY GRAVEL: fine to coarse grained, sub angular, pale yellowish brown mottled grey; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are distinctly to moderately weathered lithorelicts of granite. (XW - HW Granite)	9.4	9.2	0.2	Extreme	No			X
829534	TP198_0	ASS1_0_20.9.21_TP198	20/09/2021	0	soil	CI: SANDY CLAY: medium plasticity, red brown, mottled pale brown and cream; sand, fine to medium grained, trace gravel, fine to coarse grained, subangular to subrounded, of quartz, granite and dolerite; with grass rootlets; (Residual Soil)	9	8.9	0.1	Extreme	No			X
829534	TP198_1	ASS2_1.5_20.9.21_TP198	20/09/2021	1.5	soil	GC: SANDY GRAVEL: fine to coarse grained, subangular to rounded, pale brownish grey mottled red and orange; sand, fine to coarse grained, trace to with clay, medium plasticity, with cobbles, subangular, gravel and cobbles are distinctly weathered lithorelicts of granite. (XW - HW Granite)	8.4	8.5	-0.1	Extreme	No			X
829534	TP036_3	ASS4_3_27.8.21_TP036	27/08/2021	3	soil	GC: CLAYEY SAND/GRAVEL/GRAVELLY SAND : gravel, fine to coarse grained, subangular, dark orange brown mottled cream and pale red; clay, medium plasticity, trace to with cobbles, subangular; Gravel and cobbles are of highly to moderately weathered granite. (XW - HW Granite)	9.7	10	-0.3	Extreme	No			X
Cone Penetration Mostap samples														
820498	CPT038	ASS1_2.6_14.8.21_CPT038	14.8.21	2.60	soil	Clay	8.7	7.2	1.5	Extreme	No			X
820498	CPT035	ASS2_3.8_14.8.21_CPT035	14.8.21	3.80	soil	Silty Sand & Sandy Silt	9.4	8.2	1.2	Extreme	No			X
820498	CPT036	ASS3_2.6_14.8.21_CPT036	14.8.21	2.60	soil	Clay & Silty Clay	9.1	7.9	1.2	Extreme	No			X
820498	CPT038	ASS4_2.3_14.8.21_CPT038	14.8.21	2.30	soil	Silty Sand & Sandy Silt	9.6	8.1	1.5	Moderate	No			X
820498	CPT037	ASS1_4.1_15.8.21_CPT037	15.8.21	4.10	soil	Clay & Silty Clay	9.6	8.4	1.2	Extreme	No			X
820498	CPT037	ASS2_3.2_15.8.21_CPT037	15.8.21	3.20	soil	Sand & Silty Sand	9.5	8.1	1.4	Moderate	No			X
820498	CPT037	ASS3_1.6_15.8.21_CPT037	15.8.21	1.60	soil	Silty Sand & Sandy Silt	9.6	8	1.6	Moderate	No			X
820498	CPT039	ASS1_2.9_15.8.21_CPT039	15.8.21	2.90	soil	Very Dense/Stiff Soil	9.6	8.1	1.5	Moderate	No			X
820498	CPT040	ASS1_0.9_16.8.21_CPT040	16.8.21	0.90	soil	Sensitive Fine-Grained	9.1	7.2	1.9	Extreme	No			X
820498	CPT040	ASS2_0.3_16.8.21_CPT040	16.8.21	0.30	soil	Clay	9.3	9.2	0.1	Extreme	No			X
820498	CPT041	ASS1_1.4_16.8.21_CPT041	16.8.21	1.40	soil	Clay & Silty Clay	9.6	8.2	1.4	Moderate	No			X
820498	CPT041A	ASS2_2_16.8.21_CPT041A	.8.21_C	2.00	soil	Sand & Silty Sand	9.2	8	1.2	Extreme	No			X
820498	CPT041A	ASS3_3.3_16.8.21_CPT041A	16.8.21	3.30	soil	Sand & Silty Sand	9.6	8.1	1.5	Moderate	No			X
820498	CPT042	ASS4_2.2_16.8.21_CPT042	16.8.21	2.20	soil	Silty Sand & Sandy Silt	9.5	8	1.5	Moderate	No			X
820498	CPT043	ASS1_2.5_17.8.21_CPT043	17.8.21	2.50	soil	Clay	9.5	8.1	1.4	Moderate	No			X
820498	CPT044	ASS2_2.5_17.8.21_CPT044	17.8.21	2.50	soil	Clay	9.5	8.2	1.3	Moderate	No			X
820498	CPT044	ASS3_1.7_17.8.21_CPT044	17.8.21	1.70	soil	Sand & Silty Sand	8.9	7.8	1.1	Extreme	No			X
820498	CPT045	ASS4_2.2_17.8.21_CPT045	17.8.21	2.20	soil	Sand & Silty Sand	9	7.9	1.1	Extreme	No			X
820498	CPT046	ASS1_0.5_18.8.21_CPT046	18.8.21	0.50	soil	Sensitive Fine-Grained	9.3	8.8	0.5	Extreme	No			X
820498	CPT047	ASS2_2.4_18.8.21_CPT047	18.8.21	2.40	soil	Clay	9.1	7.2	1.9	Extreme	No			X
820498	CPT047	ASS3_1.8_18.8.21_CPT047	18.8.21	1.80	soil	Organic Soil	8.9	6.7	2.2	Extreme	No			X
820498	CPT048	ASS4_3.7_18.8.21_CPT048	18.8.21	3.70	soil	Clay & Silty Clay	9.3	7.9	1.4	Extreme	No			X
820498	CPT049	ASS1_2.9_19.8.21_CPT049	19.8.21	2.90	soil	Very Dense/Stiff Soil	9.6	8.2	1.4	Extreme	No			X
820498	CPT049	ASS2_2_19.8.21_CPT049	19.8.21	2.00	soil	Clay	9.4	7.7	1.7	Extreme	No			X
820498	CPT050	ASS3_2.1_19.8.21_CPT050	19.8.21	2.10	soil	Clay	9.5	8	1.5	Extreme	No			X

Table 4 - Summary of Potential Acid Sulfate Soil Screening Results

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

							Field Screening Tests							
												PASS		
Laboratory Report	Location ID	Sample ID	Date	Depth (m)	Matrix	Material Description	pH_F	pH_{OX}	pH_F - pH_{OX}	Reaction Strength (N, Si, M, St, E)	AASS	High	Medium	Low
820498	CPT051	ASS1_2.2_20.8.21_CPT051	20.8.21	2.20	soil	Clay	9.2	7.8	1.4	Extreme	No			X
820498	CPT051	ASS2_1.9_20.8.21_CPT051	20.8.21	1.90	soil	Clay	9	8.1	0.9	Extreme	No			X
820498	CPT052	ASS3_0.7_20.8.21_CPT052	20.8.21	0.70	soil	Organic Soil	9.2	3.1	**6.1**	Extreme	No		X	
820498	CPT053	ASS1_0.2_21.8.21_CPT053	21.8.21	0.20	soil	Organic Soil	8.8	8.7	0.1	Extreme	No			X
820498	CPT053	ASS2_1.8_21.8.21_CPT053	21.8.21	1.80	soil	Clay	8.9	8.7	0.2	Extreme	No			X
820498	CPT054	ASS3_1.8_21.8.21_CPT054	21.8.21	1.80	soil	Clay	9.2	7.8	1.4	Extreme	No			X
820498	CPT055	ASS4_1.7_21.8.21_CPT055	21.8.21	1.70	soil	Organic Soil	9.5	7.4	2.1	Extreme	No			X
820498	CPT055	ASS5_1.8_21.8.21_CPT055	21.8.21	1.80	soil	Clay	8.8	8	0.8	Extreme	No			X
820498	CPT056	ASS6_1.7_21.8.21_CPT056	21.8.21	1.70	soil	Sensitive Fine-Grained	9.3	7.5	1.8	Extreme	No			X
820498	CPT057	ASS1_1.6_22.8.21_CPT057	22.8.21	1.6	soil	Clay	9.2	7	2.2	Extreme	No			X
820498	CPT057	ASS2_1.6_22.8.21_CPT057	22.8.21	1.6	soil	Clay	9.3	8.2	1.1	Extreme	No			X
820498	CPT058	ASS3_1.4_22.8.21_CPT058	22.8.21	1.4	soil	Clay & Silty Clay	8.6	6.1	2.5	Extreme	No			X
820498	CPT059	ASS4_0.9_22.8.21_CPT059	22.8.21	0.9	soil	Clay	9.4	9.4	0.0	Extreme	No			X
820498	CPT076	ASS1_1.6_23.8.21_CPT076	23.8.21	1.6	soil	Clay	9.3	9.7	-0.4	Extreme	No			X
820498	CPT077	ASS2_1.9_23.8.21_CPT077	23.8.21	1.9	soil	Very Dense/Stiff Soil	9.3	9.5	-0.2	Extreme	No			X
Algal Mat Samples														
856518	SSA200	SSA200_50	17.12.21	0.05	sed	Thin brown sand, above yellow hard clay	9	8.8	0.2	Extreme	No			X
856518	SSA201	SSA201_100	17.12.21	0.1	sed	Description not provided	8.7	8.9	-0.2	Extreme	No			X
856518	SSA099R	SSA099R_0-50	17.12.21	0-0.05	sed	SAND: fine to medium grained; red brown; with clay	8.8	8.3	0.5	Extreme	No			X
856518	SSA102R	SSA102R_100	17.12.21	0.1	sed	Description not provided	8.6	8.8	-0.2	Extreme	No			X
856518	SSA059	SSA059_100	17.12.21	0.1	sed	Description not provided	8.6	8.5	0.1	Extreme	No			X
856518	SSA061	SSA061_00	17.12.21	0.1	sed	CLAYEY SAND: fine to medium grained; red brown; dense	8.5	8.9	-0.4	Extreme	No			X
856518	SSA085R	SSA085R_100	17.12.21	0.1	sed	Description not provided	8.3	8.3	0	Extreme	No			X
856518	SSA062	SSA062	17.12.21	0.1	sed	SANDY CLAY: medium plasticity; red brown; sand, fine grained	8.3	8.5	-0.2	Extreme	No			X
856518	SSA063	SSA063_100	17.12.21	0.1	sed	Description not provided	8.8	8.6	0.2	Extreme	No			X
856518	SSA064	SSA064_100	17.12.21	0.1	sed	Description not provided	8.6	8.7	-0.1	Extreme	No			X
856518	SSA065	SSA065_100	17.12.21	0.1	sed	Description not provided	8.7	8.6	0.1	Extreme	No			X
856518	SSA066	SSA066_100	17.12.21	0.1	sed	Description not provided	8.6	8.7	-0.1	Extreme	No			X
856518	SSA039	SSA039_100	17.12.21	0.1	sed	Description not provided	8.8	8.8	0	Extreme	No			X
856518	SSA205	SSA205_100	17.12.21	0.1	sed	CLAY: brown and mottled	9	8.7	0.3	Extreme	No			X
856518	SSA038	SSA038_100	17.12.21	0.1	sed	Description not provided	8.4	8.6	-0.2	Extreme	No			X
856518	SSA204	SSA204_100	17.12.21	0.1	sed	CLAY: brown	8.7	8.4	0.3	Extreme	No			X
856518	SSA040	SSA040_100	17.12.21	0.1	sed	Description not provided	8.6	8.4	0.2	Extreme	No			X
856518	SSA071	SSA071_100	17.12.21	0.1	sed	Description not provided	8.2	7.1	1.1	Moderate	No			X
856518	SSA203	SSA203_50	17.12.21	0.05	sed	Description not provided	8.4	8.6	-0.2	Extreme	No			X
856518	SSA041	SSA041_100	17.12.21	0.1	sed	Description not provided	8.7	8.7	0	Extreme	No			X
856518	SSA072	SSA072_50	17.12.21	0.05	sed	Description not provided	8.4	8	0.4	Extreme	No			X
829438	SSA058	SSA058_0-50	8.8.21	0.1-0.15	sed	Description not provided	9.6	8	1.6	Moderate	No			X
829438	SSA075	SSA058_100-150	24.9.21	0.1-0.15	sed	SAND: red brown; trace fines	10	11	-1	Extreme	No			X
829438	SSA082	SSA093_100-150	24.9.21	0.1-0.15	sed	SAND: fine to coarse grained; orange brown	10	10	0	Extreme	No			X
829438	SSA005	SSA097_25-75	24.9.21	0.1-0.15	sed	SAND: dark orange brown; trace to with clay	10	11	-1	Extreme	No			X
829438	SSA069	SSA094_100-150	23.9.21	0.1-0.15	sed	CLAY: Cl; medium plasticity; red brown; trace sand, fine to medium grained.	10	10	0	Extreme	No			X
829438	SSA094	SSA099_60-80	11.8.21	0.1-0.15	sed	SAND: fine to medium grained; red brown; with clay	11	9.9	1.1	Moderate	No			X
829438	SSA093	SSA089_100-150	8.8.21	0.1-0.15	sed	SAND: fine to medium grained; red brown; with clay	11	9.5	1.5	Moderate	No			X
829438	SSA099	SSA069_100-150	12.8.21	0.06-0.08	sed	SAND: fine to medium grained; red brown; with clay	11	9.5	1.5	Moderate	No			X
829438	SSA014	SSA113_100-150	24.9.21	0.1-0.15	sed	Description not provided	11	11	0	Extreme	No			X
829438	SSA097	SSA082_100-150	11.8.21	0.025-0.075	sed	CLAYEY SAND: fine to medium grained; red brown	12	10	2	Moderate	No			X
829438	SSA058	SSA014_100-150	8.8.21	0-0.05	sed	Description not provided	12	11	1	Extreme	No			X
829438	SSA113	SSA075_100-150	23.9.21	0.1-0.15	sed	SAND: orange brown; trace clay	12	11	1	Moderate	No			X
829438	SSA089	SSA005_100-150	13.8.21	0.1-0.15	sed	Description not provided	13	12	1	Moderate	No			X

Table 5 - Summary of Analytical Results - Chromium Reducible Sulfur

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

Field ID	CPT037_1.6	CPT040_0.9	CPT047_2.4	CPT047_1.8	CPT049_2	CPT052_0.7	CPT055_1.7	CPT057_1.6	CPT058_1.4
Date	15.8.21	16.8.21	18.8.21	18.8.21	19.8.21	20.8.21	21.8.21	22.8.21	22.8.21
Laboratory	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins	Eurofins
Laboratory Report	820498/ 834932	820498/ 834932	820498/ 834932	820498/ 834932	820498/ 834932	820498/ 834932	820498/ 834932	820498/ 834932	820498/ 834932
Material Description	silty sand & sandy silt	sensitive fine-grained	clay	organic soil	clay	organic soil	organic soil	clay	clay & silty clay

Analyte	Unit	LOR	WQA (2018) Action criteria - sands to loamy sands > 1,000 tonne materials disturbed	WQA (2018) Action criteria - clayey sand to light clay > 1,000 tonne materials disturbed								
CRS Suite												
Acid Neutralising Capacity - acidity (a-ANCbt)	mol H+/t	10			12000	4800	1900	1600	2400	1000	3500	2000	2000.00
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	% S	0.02			19	7.7	3.1	2.6	3.9	1.7	5.5	3.1	3.20
Acid Neutralising Capacity (ANCbt)	% CaCO3	0.01			59	24	9.7	8	12	5.1	17	9.8	10.00
Acid trail - Titratable Actual Acidity	mol H+/t	2			< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
ANC Fineness Factor	factor	1			1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.50
Chromium Reducible Sulfur	% S	0.01			0.68	0.32	0.31	1.5	0.019	1.1	2.2	1.3	6.00
Chromium Reducible Sulfur -acidity units	mol H+/t	3			420	200	190	950	12	690	1400	790	3800.00
CRS Suite - Liming Rate	kg CaCO3/t	1			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	180.00
CRS suite - NASSG (Excluding ANC) - Liming Rate	kg CaCO3/t	1			32	15	14	71	< 1	52	100	59	280.00
CRS suite - NASSG (Excluding ANC) - Net Acidity (Acidity Units)	mol H+/t	10	**18**	**18**	**420**	**200**	**190**	**950**	12	**690**	**1,400**	**790**	**3,800**
CRS Suite - NASSG (Excluding ANC) - Net Acidity (Sulfur Units)	% S	0.02	**0.03**	**0.03**	**0.68**	**0.32**	**0.31**	**1.50**	0.02	**1.10**	**2.20**	**1.30**	**6.00**
CRS Suite - Net Acidity (Acidity Units)	mol H+/t	10	**18**	**18**	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	**2,400**
CRS Suite - Net Acidity (Sulfur Units)	% S	0.02	**0.03**	**0.03**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	**3.90**
HCl Extractable Sulfur	% S	0.02			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	factor	1			2	2	2	2	2	2	2	2	2.00
Net Acid soluble sulfur	% S	0.02			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net Acid soluble sulfur - acidity units	mol H+/t	10			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net Acid soluble sulfur - equivalent S% pyrite	% S	0.02			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
pH-KCL	pH Units	0.10			8.9	9.2	9.1	8.6	8.9	8.8	8.6	8.7	8.00
sulfidic - TAA equiv. S% pyrite	% pyrite S	0.003			< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Sulfur - KCl Extractable	% S	0.02			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Extraneous Material													
<2mm Fraction	g	0.01			29	27	42	30	30	48	33	52	39.00
>2mm Fraction	g	0.01			9.7	4.9	< 0.005	< 0.005	< 0.005	3.8	2.2	< 0.005	1.90
Analysed Material	**%**	0.10			75	85	100	100	100	93	94	100	95.00
Extraneous Material	**%**	0.10			25	15	< 0.1	< 0.1	< 0.1	7.3	6.2	< 0.1	4.70

Table 6 - Summary of Analytical Results - Particle Size Distribution

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

				Size range (µm)/ Description and % Distribution					
				0.020-3.991	3.991-63.246	63.246-251.785	251.785-500	500-2000	2000-10000
Date	Laboratory Report	Lab ID	Sample ID	Clay	Silt	Fine sand	Medium sand	Coarse sand	Gravel
4/04/2022	882083	22_0637_09	SS/MBH001	20.96	47.44	15.91	1.70	6.66	7.33
4/04/2022	882083	22_0637_06	SS/MBH003	6.61	20.52	43.02	15.42	14.43	0.00
4/04/2022	882083	22_0637_10	SS/MBH008	5.14	12.16	20.05	31.22	31.09	0.34
4/04/2022	882083	22_0637_08	SS/MBH017	26.63	50.72	12.44	0.35	7.35	2.51
4/04/2022	882083	22_0637_11	SS/MBH019	15.76	27.09	14.14	9.35	23.28	10.39
4/04/2022	882083	22_0637_07	SS/MBH020	19.66	32.65	24.87	8.26	12.80	1.76
4/04/2022	882083	22_0637_05	SS/MBH06	34.00	27.45	8.92	1.48	22.72	5.43
4/04/2022	882083	22_0637_04	SS/SW03	0.35	0.62	0.11	0.15	53.67	45.10
30/03/2022	879589	22_0600_37	SS/SW04	4.98	14.69	2.97	1.27	52.93	23.15
30/03/2022	879589	22_0600_38	SS/SW05	0.26	0.40	0.04	0.01	91.61	7.69
30/03/2022	879589	22_0600_39	SS/SW07	0.24	0.29	0.03	0.00	80.54	18.91
30/03/2022	879589	22_0600_40	SS/SW08	15.04	39.26	15.94	9.52	17.57	2.67
30/03/2022	879589	22_0600_43	DUP3	12.35	46.50	9.59	5.14	21.69	4.72
4/04/2022	882083	22_0637_12	SS/SW09	0.51	1.77	0.10	6.70	79.91	11.00
4/04/2022	882083	22_0637_03	SS/SW12	41.11	52.30	2.79	0.00	0.00	3.80
30/03/2022	879589	22_0600_14	SS101	5.55	37.30	16.38	4.88	35.50	0.39
30/03/2022	879589	22_0600_08	SS102	14.64	41.14	17.78	4.68	21.48	0.28
30/03/2022	879589	22_0600_17	SS103	3.90	20.56	13.86	4.38	42.90	14.41
30/03/2022	879589	22_0600_21	SS104	10.98	24.47	16.38	6.64	28.65	12.87
30/03/2022	879589	22_0600_13	SS105	21.85	46.38	15.52	2.08	8.49	5.68
4/04/2022	882083	22_0637_01	SS106	12.43	53.35	15.57	4.39	13.51	0.75
30/03/2022	879589	22_0600_22	SS107	22.50	42.39	15.23	1.93	14.79	3.16
30/03/2022	879589	22_0600_27	DUP2	12.26	31.92	16.61	3.43	34.03	1.75
30/03/2022	879589	22_0600_19	SS108	10.70	47.41	11.54	0.74	9.61	20.00
30/03/2022	879589	22_0600_26	DUP1	23.80	60.62	6.08	0.28	7.01	2.20
30/03/2022	879589	22_0600_15	SS109	18.07	45.66	5.70	1.31	24.12	5.13
30/03/2022	879589	22_0600_20	SS110	33.00	32.15	6.82	0.00	14.46	13.56
30/03/2022	879589	22_0600_12	SS111	24.76	47.42	6.41	0.00	16.31	5.10
30/03/2022	879589	22_0600_18	SS112	8.59	26.35	39.21	9.68	11.75	4.42
30/03/2022	879589	22_0600_16	SS113	12.14	54.66	12.37	5.19	13.40	2.24
4/04/2022	882083	22_0637_02	SS114	17.80	21.71	22.01	10.02	13.80	14.66
30/03/2022	879589	22_0600_35	SS115	15.91	34.54	15.84	1.99	24.01	7.71
30/03/2022	879589	22_0600_31	SS116	8.99	30.96	32.18	7.68	16.65	3.53
30/03/2022	879589	22_0600_34	SS117	10.17	42.62	8.81	0.10	34.39	3.90
30/03/2022	879589	22_0600_36	SS118	16.78	40.95	15.09	2.91	16.33	7.96
29/03/2022	879589	22_0600_07	SS119	4.68	11.07	13.25	9.38	54.20	7.42
30/03/2022	879589	22_0600_33	SS120	11.63	35.57	11.19	4.76	28.74	8.11
30/03/2022	879589	22_0600_32	SS121	0.53	1.15	0.14	5.05	83.41	9.74
30/03/2022	879589	22_0600_28	SS201	11.97	49.11	12.91	3.27	17.56	5.18
29/03/2022	879589	22_0600_01	SS202	41.54	39.65	2.03	0.00	9.61	7.17
29/03/2022	879589	22_0600_02	SS203	36.78	37.70	9.02	1.25	6.59	8.66
30/03/2022	879589	22_0600_29	SS204	24.82	46.68	4.77	0.55	11.00	12.17
30/03/2022	879589	22_0600_23	SS205	17.34	58.83	8.72	0.80	11.25	3.07
30/03/2022	879589	22_0600_30	SS206	6.55	22.16	30.15	11.45	18.07	11.63
30/03/2022	879589	22_0600_41	SS207	20.43	45.72	15.52	2.06	7.34	8.93
30/03/2022	879589	22_0600_42	SS208	3.78	9.66	8.24	1.96	4.85	71.52
29/03/2022	879589	22_0600_03	SS209	43.70	25.23	10.56	3.82	14.15	2.54
30/03/2022	879589	22_0600_24	SS210	14.29	59.63	13.41	0.76	10.96	0.95
30/03/2022	879589	22_0600_10	SS211	36.30	37.25	18.92	1.54	4.33	1.65
29/03/2022	879589	22_0600_04	SS212	21.79	41.77	16.63	4.19	8.58	7.03
30/03/2022	879589	22_0600_09	SS213	12.99	41.36	10.76	0.18	5.21	29.49
30/03/2022	879589	22_0600_11	SS214	35.65	38.39	18.04	0.64	4.07	3.21
29/03/2022	879589	22_0600_05	SS215	41.49	40.46	6.61	0.15	7.40	3.88
29/03/2022	879589	22_0600_06	SS216	44.87	41.09	5.02	0.66	6.91	1.45
30/03/2022	879589	22_0600_25	SS217	12.27	49.87	18.02	6.19	11.88	1.77

APPENDIX A – CERTIFIED LABORATORY ANALYTICAL REPORTS

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Attention: **Karen Mackenzie**

Report **820498-S**
Project name
Project ID W-AO
Received Date Aug 27, 2021

Client Sample ID			**ASS1_2.6_14.8.21_CPT038**	**ASS2_3.8_14.8.21_CPT035**	**ASS3_2.6_14.8.21_CPT036**	**ASS4_2.3_14.8.21_CPT038**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54467**	**P21-Au54468**	**P21-Au54469**	**P21-Au54470**
Date Sampled			**Aug 14, 2021**	**Aug 14, 2021**	**Aug 14, 2021**	**Aug 14, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.7	9.4	9.1	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	8.2	7.9	8.1
Reaction Ratings*[S05]	-	comment	4.0	4.0	4.0	2.0

Client Sample ID			**ASS1_4.1_15.8.21_CPT037**	**ASS2_3.2_15.8.21_CPT037**	**ASS3_1.6_15.8.21_CPT037**	**ASS1_2.9_15.8.21_CPT039**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54471**	**P21-Au54472**	**P21-Au54473**	**P21-Au54474**
Date Sampled			**Aug 15, 2021**	**Aug 15, 2021**	**Aug 15, 2021**	**Aug 15, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.5	9.6	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.4	8.1	8.0	8.1
Reaction Ratings*[S05]	-	comment	4.0	2.0	2.0	2.0

Client Sample ID			**ASS1_0.9_16.8.21_CPT040**	**ASS2_0.3_16.8.21_CPT040**	**ASS1_1.4_16.8.21_CPT041**	**ASS2_2_16.8.21_CPT041A**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54475**	**P21-Au54476**	**P21-Au54477**	**P21-Au54478**
Date Sampled			**Aug 16, 2021**	**Aug 16, 2021**	**Aug 16, 2021**	**Aug 16, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	9.3	9.6	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	9.2	8.2	8.0
Reaction Ratings*[S05]	-	comment	4.0	4.0	2.0	4.0

Client Sample ID			ASS3_3.3_16.8.21_CPT041A	ASS4_2.2_16.8.21_CPT042	ASS1_2.5_17.8.21_CPT043	ASS2_2.5_17.8.21_CPT044
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54479**	**P21-Au54480**	**P21-Au54481**	**P21-Au54482**
Date Sampled			**Aug 16, 2021**	**Aug 16, 2021**	**Aug 17, 2021**	**Aug 17, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.5	9.5	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	8.0	8.1	8.2
Reaction Ratings*[S05]	-	comment	2.0	2.0	2.0	2.0

Client Sample ID			ASS3_1.7_17.8.21_CPT044	ASS4_2.2_17.8.21_CPT045	ASS1_0.5_18.8.21_CPT046	ASS2_2.4_18.8.21_CPT047
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54483**	**P21-Au54484**	**P21-Au54485**	**P21-Au54486**
Date Sampled			**Aug 17, 2021**	**Aug 17, 2021**	**Aug 18, 2021**	**Aug 18, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	9.0	9.3	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.8	7.9	8.8	7.2
Reaction Ratings*[S05]	-	comment	4.0	4.0	4.0	4.0

Client Sample ID			ASS3_1.8_18.8.21_CPT047	ASS4_3.7_18.8.21_CPT048	ASS1_2.9_19.8.21_CPT049	ASS2_2_19.8.21_CPT049
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54487**	**P21-Au54488**	**P21-Au54489**	**P21-Au54490**
Date Sampled			**Aug 18, 2021**	**Aug 18, 2021**	**Aug 19, 2021**	**Aug 19, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	9.3	9.6	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	7.9	8.2	7.7
Reaction Ratings*[S05]	-	comment	4.0	4.0	4.0	4.0

Client Sample ID			ASS3_2.1_19.8.21_CPT050	ASS1_2.2_20.8.21_CPT051	ASS2_1.9_20.8.21_CPT051	ASS3_0.7_20.8.21_CPT052
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54491**	**P21-Au54492**	**P21-Au54493**	**P21-Au54494**
Date Sampled			**Aug 19, 2021**	**Aug 20, 2021**	**Aug 20, 2021**	**Aug 20, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.2	9.0	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.0	7.8	8.1	3.1
Reaction Ratings*[S05]	-	comment	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0.2_21.8.21_CPT053	ASS2_1.8_21.8.21_CPT053	ASS3_1.8_21.8.21_CPT054	ASS4_1.7_21.8.21_CPT055
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54495**	**P21-Au54496**	**P21-Au54497**	**P21-Au54498**
Date Sampled			**Aug 21, 2021**	**Aug 21, 2021**	**Aug 21, 2021**	**Aug 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	8.9	9.2	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.7	8.7	7.8	7.4
Reaction Ratings*[S05]	-	comment	4.0	4.0	4.0	4.0

Client Sample ID			ASS5_1.8_21.8.21_CPT055	ASS6_1.7_21.8.21_CPT056	ASS1_1.6_22.8.21_CPT057	ASS2_1.6_22.8.21_CPT057
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54499**	**P21-Au54500**	**P21-Au54501**	**P21-Au54502**
Date Sampled			**Aug 21, 2021**	**Aug 21, 2021**	**Aug 22, 2021**	**Aug 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	9.3	9.2	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.0	7.5	7.0	8.2
Reaction Ratings*[S05]	-	comment	4.0	4.0	4.0	4.0

Client Sample ID			ASS3_1.4_22.8.21_CPT058	ASS4_0.9_22.8.21_CPT059	ASS1_1.6_23.8.21_CPT076	ASS2_1.9_23.8.21_CPT077
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**P21-Au54503**	**P21-Au54504**	**P21-Au54505**	**P21-Au54506**
Date Sampled			**Aug 22, 2021**	**Aug 22, 2021**	**Aug 23, 2021**	**Aug 23, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.6	9.4	9.3	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.1	9.4	9.7	9.5
Reaction Ratings*[S05]	-	comment	4.0	4.0	4.0	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acid Sulfate Soils Field pH Test	Perth	Aug 30, 2021	7 Days

- Method: LTM-GEN- 7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

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IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name:
Project ID: W-AO

Order No.: W-AO
Report #: 820498
Phone: 08 8271 5255
Fax:

Received: Aug 27, 2021 9:30 AM
Due: Sep 3, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						X
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	ASS1_2.6_14.8.21_CPT038	Aug 14, 2021		Soil	P21-Au54467	X
2	ASS2_3.8_14.8.21_CPT035	Aug 14, 2021		Soil	P21-Au54468	X
3	ASS3_2.6_14.8.21_CPT036	Aug 14, 2021		Soil	P21-Au54469	X
4	ASS4_2.3_14.8.21_CPT038	Aug 14, 2021		Soil	P21-Au54470	X
5	ASS1_4.1_15.8.21_CPT037	Aug 15, 2021		Soil	P21-Au54471	X
6	ASS2_3.2_15.	Aug 15, 2021		Soil	P21-Au54472	X

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Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						X
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
	8.21_CPT037					
7	ASS3_1.6_15.8.21_CPT037	Aug 15, 2021		Soil	P21-Au54473	X
8	ASS1_2.9_15.8.21_CPT039	Aug 15, 2021		Soil	P21-Au54474	X
9	ASS1_0.9_16.8.21_CPT040	Aug 16, 2021		Soil	P21-Au54475	X
10	ASS2_0.3_16.8.21_CPT040	Aug 16, 2021		Soil	P21-Au54476	X
11	ASS1_1.4_16.8.21_CPT041	Aug 16, 2021		Soil	P21-Au54477	X
12	ASS2_2_16.8.21_CPT041A	Aug 16, 2021		Soil	P21-Au54478	X

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Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						X
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
13	ASS3_3.3_16.8.21_CPT041A	Aug 16, 2021		Soil	P21-Au54479	X
14	ASS4_2.2_16.8.21_CPT042	Aug 16, 2021		Soil	P21-Au54480	X
15	ASS1_2.5_17.8.21_CPT043	Aug 17, 2021		Soil	P21-Au54481	X
16	ASS2_2.5_17.8.21_CPT044	Aug 17, 2021		Soil	P21-Au54482	X
17	ASS3_1.7_17.8.21_CPT044	Aug 17, 2021		Soil	P21-Au54483	X
18	ASS4_2.2_17.8.21_CPT045	Aug 17, 2021		Soil	P21-Au54484	X

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Melbourne Laboratory - NATA Site # 1254						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						X
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
19	ASS1_0.5_18.8.21_CPT046	Aug 18, 2021		Soil	P21-Au54485	X
20	ASS2_2.4_18.8.21_CPT047	Aug 18, 2021		Soil	P21-Au54486	X
21	ASS3_1.8_18.8.21_CPT047	Aug 18, 2021		Soil	P21-Au54487	X
22	ASS4_3.7_18.8.21_CPT048	Aug 18, 2021		Soil	P21-Au54488	X
23	ASS1_2.9_19.8.21_CPT049	Aug 19, 2021		Soil	P21-Au54489	X
24	ASS2_2_19.8.21_CPT049	Aug 19, 2021		Soil	P21-Au54490	X
25	ASS3_2.1_19.	Aug 19, 2021		Soil	P21-Au54491	X

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IANZ # 1327

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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name:
Project ID: W-AO

Order No.: W-AO
Report #: 820498
Phone: 08 8271 5255
Fax:

Received: Aug 27, 2021 9:30 AM
Due: Sep 3, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						X
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
25	ASS3_2.1_19.8.21_CPT050	Aug 19, 2021		Soil	P21-Au54491	
26	ASS1_2.2_20.8.21_CPT051	Aug 20, 2021		Soil	P21-Au54492	X
27	ASS2_1.9_20.8.21_CPT051	Aug 20, 2021		Soil	P21-Au54493	X
28	ASS3_0.7_20.8.21_CPT052	Aug 20, 2021		Soil	P21-Au54494	X
29	ASS1_0.2_21.8.21_CPT053	Aug 21, 2021		Soil	P21-Au54495	X
30	ASS2_1.8_21.8.21_CPT053	Aug 21, 2021		Soil	P21-Au54496	X
31	ASS3_1.8_21.	Aug 21, 2021		Soil	P21-Au54497	X

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Perth Laboratory - NATA Site # 23736						X
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
	8.21_CPT054					
32	ASS4_1.7_21.8.21_CPT055	Aug 21, 2021		Soil	P21-Au54498	X
33	ASS5_1.8_21.8.21_CPT055	Aug 21, 2021		Soil	P21-Au54499	X
34	ASS6_1.7_21.8.21_CPT056	Aug 21, 2021		Soil	P21-Au54500	X
35	ASS1_1.6_22.8.21_CPT057	Aug 22, 2021		Soil	P21-Au54501	X
36	ASS2_1.6_22.8.21_CPT057	Aug 22, 2021		Soil	P21-Au54502	X
37	ASS3_1.4_22.8.21_CPT058	Aug 22, 2021		Soil	P21-Au54503	X

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Received: Aug 27, 2021 9:30 AM
Due: Sep 3, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Acid Sulfate Soils Field pH Test
Melbourne Laboratory - NATA Site # 1254						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						X
Mayfield Laboratory - NATA Site # 25079						
External Laboratory						
38	ASS4_0.9_22.8.21_CPT059	Aug 22, 2021		Soil	P21-Au54504	X
39	ASS1_1.6_23.8.21_CPT076	Aug 23, 2021		Soil	P21-Au54505	X
40	ASS2_1.9_23.8.21_CPT077	Aug 23, 2021		Soil	P21-Au54506	X
Test Counts						40

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	P21-Au54475	CP	pH Units	9.1	9.1	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P21-Au54475	CP	pH Units	7.2	6.9	pass	30%	Pass	
Reaction Ratings*	P21-Au54475	CP	comment	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	P21-Au54485	CP	pH Units	9.3	9.4	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P21-Au54485	CP	pH Units	8.8	8.7	pass	30%	Pass	
Reaction Ratings*	P21-Au54485	CP	comment	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	P21-Au54495	CP	pH Units	8.8	8.6	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P21-Au54495	CP	pH Units	8.7	9.0	pass	30%	Pass	
Reaction Ratings*	P21-Au54495	CP	comment	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	P21-Au54505	CP	pH Units	9.3	9.3	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	P21-Au54505	CP	pH Units	9.7	9.4	pass	30%	Pass	
Reaction Ratings*	P21-Au54505	CP	comment	4.0	4.0	pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Robert Johnston	Analytical Services Manager
Rhys Thomas	Senior Analyst-SPOCAS (WA)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Karen Mackenzie
Project name:	Not provided
Project ID:	W-AO
Turnaround time:	5 Day
Date/Time received	Aug 27, 2021 9:30 AM
Eurofins reference	820498

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Rhys Thomas on phone : (+61) 8 9251 9602 or by email: RhysThomas@eurofins.com

Results will be delivered electronically via email to Karen Mackenzie - kmackenzie@lwconsulting.com.au.

Global Leader - Results you can trust

SAMPLE MANIFEST

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent: 26-Aug-21
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pH field	pH fox					
CPT038	ASS1	14.8.21	2.60	Soil	x	x					
CPT035	ASS2	14.8.21	3.80	Soil	x	x					
CPT036	ASS3	14.8.21	2.60	Soil	x	x					
CPT038	ASS4	14.8.21	2.30	Soil	x	x					
CPT037	ASS1	15.8.21	4.10	Soil	x	x					
CPT037	ASS2	15.8.21	3.20	Soil	x	x					
CPT037	ASS3	15.8.21	1.60	Soil	x	x					
CPT039	ASS1	15.8.21	2.90	Soil	x	x					
CPT040	ASS1	16.8.21	0.90	Soil	x	x					
CPT040	ASS2	16.8.21	0.30	Soil	x	x					
CPT041	ASS1	16.8.21	1.40	Soil	x	x					
CPT041A	ASS2	16.8.21	2.00	Soil	x	x					
CPT041A	ASS3	16.8.21	3.30	Soil	x	x					
CPT042	ASS4	16.8.21	2.20	Soil	x	x					
CPT043	ASS1	17.8.21	2.50	Soil	x	x					
CPT044	ASS2	17.8.21	2.50	Soil	x	x					
CPT044	ASS3	17.8.21	1.70	Soil	x	x					
CPT045	ASS4	17.8.21	2.20	Soil	x	x					
CPT046	ASS1	18.8.21	0.50	Soil	x	x					
CPT047	ASS2	18.8.21	2.40	Soil	x	x					
CPT047	ASS3	18.8.21	1.80	Soil	x	x					
CPT048	ASS4	18.8.21	3.70	Soil	x	x					
CPT049	ASS1	19.8.21	2.90	Soil	x	x					
CPT049	ASS2	19.8.21	2.00	Soil	x	x					
CPT050	ASS3	19.8.21	2.10	Soil	x	x					
CPT051	ASS1	20.8.21	2.20	Soil	x	x					
CPT051	ASS2	20.8.21	1.90	Soil	x	x					
CPT052	ASS3	20.8.21	0.70	Soil	x	x					
CPT053	ASS1	21.8.21	0.20	Soil	x	x					
CPT053	ASS2	21.8.21	1.80	Soil	x	x					
CPT054	ASS3	21.8.21	1.80	Soil	x	x					
CPT055	ASS4	21.8.21	1.70	Soil	x	x					
CPT055	ASS5	21.8.21	1.80	Soil	x	x					
CPT056	ASS6	21.8.21	1.70	Soil	x	x					
CPT057	ASS1	22.8.21	1.60	Soil	x	x					
CPT057	ASS2	22.8.21	1.60	Soil	x	x					
CPT058	ASS3	22.8.21	1.40	Soil	x	x					
CPT059	ASS4	22.8.21	0.90	Soil	x	x					
CPT076	ASS1	23.8.21	1.60	Soil	x	x					
CPT077	ASS2	23.8.21	1.90	Soil	x	x					
			TOTAL	0							

ADDITIONAL COMMENTS:

M = SUBSAMPLED FROM MOSTAP SAMPLE
P = SUBSAMPLED FROM PISTON SAMPLE

Date/Time: 27/8/21 4:30

Chilled: Yes / No

Temp: 12.0
10.7
7.1
6.4
Final Temp: 4.3
13.6
-0.3
8.7 °C

Caitlyn Gibson CR
Eurofins #8020498

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Attention: **Karen Mackenzie**

Report **829368-S**
Project name
Project ID W-AO
Received Date Sep 29, 2021

Client Sample ID			**ASS1_0_21.9.21_TP195**	**ASS2_1.8_21.9.21_TP195**	**ASS1_0_21.9.21_TP194**	**ASS2_1.65_21.9.21_TP194**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05302**	**L21-Oc05303**	**L21-Oc05304**	**L21-Oc05305**
Date Sampled			**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.7	8.9	9.1	9.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.4	8.7	9.2	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			**ASS1_0_21.9.21_TP193**	**ASS2_2.2_21.9.21_TP193**	**ASS1_0_21.9.21_TP192**	**ASS2_1.7_21.9.21_TP192**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05306**	**L21-Oc05307**	**L21-Oc05308**	**L21-Oc05309**
Date Sampled			**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	8.6	9.0	9.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.7	8.5	8.5	9.7
Reaction Ratings*[S05]	0	-	4.0	2.0	2.0	2.0

Client Sample ID			**ASS1_0_21.9.21_TP212**	**ASS2_1.45_21.9.21_TP212**	**ASS1_0_21.9.21_TP213**	**ASS2_1.5_21.9.21_TP213**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05310**	**L21-Oc05311**	**L21-Oc05312**	**L21-Oc05313**
Date Sampled			**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	9.1	9.2	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.2	9.5	9.2	9.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_21.9.21_TP214	ASS2_2_21.9.21_TP214	ASS1_0_21.9.21_TP215	ASS2_1.2_21.9.21_TP215
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05314**	**L21-Oc05315**	**L21-Oc05316**	**L21-Oc05317**
Date Sampled			**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.2	9.9	9.4	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.2	11	9.3	9.6
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_21.9.21_TP216	ASS2_1.75_21.9.21_TP216	ASS1_0_21.9.21_TP217	ASS2_1.95_21.9.21_TP217
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05318**	**L21-Oc05319**	**L21-Oc05320**	**L21-Oc05321**
Date Sampled			**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**	**Sep 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.3	9.3	7.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.6	9.3	9.0	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_22.9.21_TP001	ASS2_1.8_22.9.21_TP001	ASS1_0_22.9.21_TP204	ASS2_2.5_22.9.21_TP204
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05322**	**L21-Oc05323**	**L21-Oc05324**	**L21-Oc05325**
Date Sampled			**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.4	8.3	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.4	9.5	7.5	9.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_22.9.21_TP205	ASS2_2.3_22.9.21_TP205	ASS1_0_22.9.21_TP206	ASS2_1.8_22.9.21_TP206
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05326**	**L21-Oc05327**	**L21-Oc05328**	**L21-Oc05329**
Date Sampled			**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.8	7.6	9.0	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.7	7.8	8.9	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_22.9.21_TP207	ASS2_1.7_22.9.21_TP207	ASS1_0_22.9.21_TP208	ASS2_1.4_22.9.21_TP208
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05330**	**L21-Oc05331**	**L21-Oc05332**	**L21-Oc05333**
Date Sampled			**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.9	8.0	8.9	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	8.5	8.5	8.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_22.9.21_TP196	ASS2_2_22.9.21_TP196	ASS1_0_22.9.21_TP209	ASS2_1.65_22.9.21_TP209
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05334**	**L21-Oc05335**	**L21-Oc05336**	**L21-Oc05337**
Date Sampled			**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	8.8	9.3	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.0	9.0	9.0	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_22.9.21_TP210	ASS2_1.9_22.9.21_TP210	ASS1_0_22.9.21_TP211	ASS2_2.3_22.9.21_TP211
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05338**	**L21-Oc05339**	**L21-Oc05340**	**L21-Oc05341**
Date Sampled			**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**	**Sep 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	9.3	8.7	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.9	8.7	8.8	8.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_23.9.21_TP284	ASS2_3.1_23.9.21_TP284	ASS1_0_23.9.21_TP115	ASS2_2_23.9.21_TP115
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05342**	**L21-Oc05343**	**L21-Oc05344**	**L21-Oc05345**
Date Sampled			**Sep 23, 2021**	**Sep 23, 2021**	**Sep 23, 2021**	**Sep 23, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.0	9.5	9.2	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.1	9.5	7.6	8.8
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_23.9.21_TP122	ASS2_1.3_23.9.21_TP122
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05346**	**L21-Oc05347**
Date Sampled			**Sep 23, 2021**	**Sep 23, 2021**
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	8.6	9.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.9	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acid Sulfate Soils Field pH Test	Welshpool	Oct 04, 2021	7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

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Order No.: W-AO
Report #: 829368
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
Due: Oct 6, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X
Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	ASS1_0_21.9.21_TP195	Sep 21, 2021		Soil	L21-Oc05302	X
2	ASS2_1.8_21.9.21_TP195	Sep 21, 2021		Soil	L21-Oc05303	X
3	ASS1_0_21.9.21_TP194	Sep 21, 2021		Soil	L21-Oc05304	X
4	ASS2_1.65_21.9.21_TP194	Sep 21, 2021		Soil	L21-Oc05305	X
5	ASS1_0_21.9.21_TP193	Sep 21, 2021		Soil	L21-Oc05306	X
6	ASS2_2.2_21.	Sep 21, 2021		Soil	L21-Oc05307	X

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Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
External Laboratory						
	9.21_TP193					
7	ASS1_0_21.9.21_TP192	Sep 21, 2021		Soil	L21-Oc05308	X
8	ASS2_1.7_21.9.21_TP192	Sep 21, 2021		Soil	L21-Oc05309	X
9	ASS1_0_21.9.21_TP212	Sep 21, 2021		Soil	L21-Oc05310	X
10	ASS2_1.45_21.9.21_TP212	Sep 21, 2021		Soil	L21-Oc05311	X
11	ASS1_0_21.9.21_TP213	Sep 21, 2021		Soil	L21-Oc05312	X
12	ASS2_1.5_21.9.21_TP213	Sep 21, 2021		Soil	L21-Oc05313	X

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Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
External Laboratory						
13	ASS1_0_21.9.21_TP214	Sep 21, 2021		Soil	L21-Oc05314	X
14	ASS2_2_21.9.21_TP214	Sep 21, 2021		Soil	L21-Oc05315	X
15	ASS1_0_21.9.21_TP215	Sep 21, 2021		Soil	L21-Oc05316	X
16	ASS2_1.2_21.9.21_TP215	Sep 21, 2021		Soil	L21-Oc05317	X
17	ASS1_0_21.9.21_TP216	Sep 21, 2021		Soil	L21-Oc05318	X
18	ASS2_1.75_21.9.21_TP216	Sep 21, 2021		Soil	L21-Oc05319	X
19	ASS1_0_21.9.	Sep 21, 2021		Soil	L21-Oc05320	X

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Sample Detail						Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X
Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
External Laboratory						
	21_TP217					
20	ASS2_1.95_21.9.21_TP217	Sep 21, 2021		Soil	L21-Oc05321	X
21	ASS1_0_22.9.21_TP001	Sep 22, 2021		Soil	L21-Oc05322	X
22	ASS2_1.8_22.9.21_TP001	Sep 22, 2021		Soil	L21-Oc05323	X
23	ASS1_0_22.9.21_TP204	Sep 22, 2021		Soil	L21-Oc05324	X
24	ASS2_2.5_22.9.21_TP204	Sep 22, 2021		Soil	L21-Oc05325	X
25	ASS1_0_22.9.21_TP205	Sep 22, 2021		Soil	L21-Oc05326	X

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Sample Detail						Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X
Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
External Laboratory						
26	ASS2_2.3_22.9.21_TP205	Sep 22, 2021		Soil	L21-Oc05327	X
27	ASS1_0_22.9.21_TP206	Sep 22, 2021		Soil	L21-Oc05328	X
28	ASS2_1.8_22.9.21_TP206	Sep 22, 2021		Soil	L21-Oc05329	X
29	ASS1_0_22.9.21_TP207	Sep 22, 2021		Soil	L21-Oc05330	X
30	ASS2_1.7_22.9.21_TP207	Sep 22, 2021		Soil	L21-Oc05331	X
31	ASS1_0_22.9.21_TP208	Sep 22, 2021		Soil	L21-Oc05332	X
32	ASS2_1.4_22.	Sep 22, 2021		Soil	L21-Oc05333	X

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Sample Detail						Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X
Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
External Laboratory						
	9.21_TP208					
33	ASS1_0_22.9.21_TP196	Sep 22, 2021		Soil	L21-Oc05334	X
34	ASS2_2_22.9.21_TP196	Sep 22, 2021		Soil	L21-Oc05335	X
35	ASS1_0_22.9.21_TP209	Sep 22, 2021		Soil	L21-Oc05336	X
36	ASS2_1.65_22.9.21_TP209	Sep 22, 2021		Soil	L21-Oc05337	X
37	ASS1_0_22.9.21_TP210	Sep 22, 2021		Soil	L21-Oc05338	X
38	ASS2_1.9_22.9.21_TP210	Sep 22, 2021		Soil	L21-Oc05339	X

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NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

Eurofins Environment Testing NZ Limited
NZBN: 9429046024954
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35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name:
Project ID: W-AO

Order No.: W-AO
Report #: 829368
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
Due: Oct 6, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X
Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
External Laboratory						
39	ASS1_0_22.9.21_TP211	Sep 22, 2021		Soil	L21-Oc05340	X
40	ASS2_2.3_22.9.21_TP211	Sep 22, 2021		Soil	L21-Oc05341	X
41	ASS1_0_23.9.21_TP284	Sep 23, 2021		Soil	L21-Oc05342	X
42	ASS2_3.1_23.9.21_TP284	Sep 23, 2021		Soil	L21-Oc05343	X
43	ASS1_0_23.9.21_TP115	Sep 23, 2021		Soil	L21-Oc05344	X
44	ASS2_2_23.9.21_TP115	Sep 23, 2021		Soil	L21-Oc05345	X
45	ASS1_0_23.9.	Sep 23, 2021		Soil	L21-Oc05346	X

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins ARL Pty Ltd
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Perth
46-48 Banksia Road
Welshpool WA 6106
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NATA # 2377 Site # 2370

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521
Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261 Site # 1254

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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4/52 Industrial Drive
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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name:
Project ID: W-AO

Order No.: W-AO
Report #: 829368
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
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Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X
Melbourne Laboratory - NATA # 1261 Site # 1254						
Sydney Laboratory - NATA # 1261 Site # 18217						
Brisbane Laboratory - NATA # 1261 Site # 20794						
Mayfield Laboratory - NATA # 1261 Site # 25079						
External Laboratory						
	21_TP122					
46	ASS2_1.3_23.9.21_TP122	Sep 23, 2021		Soil	L21-Oc05347	X
Test Counts						46

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc05307	CP	pH Units	8.6	8.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc05307	CP	pH Units	8.5	8.7	pass	30%	Pass	
Reaction Ratings*	L21-Oc05307	CP	-	2.0	2.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc05317	CP	pH Units	9.5	9.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc05317	CP	pH Units	9.6	9.8	pass	30%	Pass	
Reaction Ratings*	L21-Oc05317	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc05327	CP	pH Units	7.6	7.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc05327	CP	pH Units	7.8	7.9	pass	30%	Pass	
Reaction Ratings*	L21-Oc05327	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc05337	CP	pH Units	9.3	9.6	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc05337	CP	pH Units	9.1	9.4	pass	30%	Pass	
Reaction Ratings*	L21-Oc05337	CP	-	4.0	4.0	pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Rhys Thomas Analytical Services Manager



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

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Girraween
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NATA# 1261 Site# 18217

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Brisbane
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Tel: +64 9 526 45 51
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Karen Mackenzie
Project name:	Not provided
Project ID:	W-AO
Turnaround time:	7 Day
Date/Time received	Sep 29, 2021 2:08 PM
Eurofins reference	829368

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
N/A	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Rhys Thomas on phone : or by email:

Results will be delivered electronically via email to Karen Mackenzie - kmackenzie@lwconsulting.com.au.

Global Leader - Results you can trust

Robert Johnston

From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Wednesday, 29 September 2021 14:08
To: Robert Johnston; Matthew Deaves
Cc: Riley Martin
Subject: Last COC for Test pit samples
Attachments: Test Pit ASS COC_DISPATCH_27SEPT21.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL*

Hi Guys,

This is the last one.

Anything I haven't scheduled so far, can you just keep on hold please.

Fewer samples were collected than planned so I can change up the analysis a bit based on the results we get.

Kind regards,

Karen

Cathy Gibson Ch
Eurofins # 829368

Date/Time: 29/9/21 2:08pm
Chilled: Yes / No
Temp: 15.4 16.0 16.8 15.3
16.3 11.9 14.2 13.8
12.3 12.5 14.4 14.8
Correction: 12.5
Final Temp:

14.3
-0.3
14.0°C

Dr Karen Mackenzie | Principal Geochemist

Land & Water Consulting
Core Innovation Hub, Level Seven,
191 St Georges Terrace, Perth, WA 6000
M: +61 448 682 774
kmackenzie@lwconsulting.com.au | www.lwconsulting.com.au

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From: Robert Johnston <RobertJohnston@eurofins.com>
Sent: Wednesday, 29 September 2021 1:10 PM

To: Karen Mackenzie <kmackenzie@lwconsulting.com.au>; Matthew Deaves <MatthewDeaves@eurofins.com>
Cc: Riley Martin <RMartin@lwconsulting.com.au>
Subject: RE: Revised COC for Test pit samples on HOLD form 26 August

Thanks for the COCs Karen. We will put these into the queue.

I believe these four Chemcentre samples have been sent.

Kind Regards,

Robert Johnston
Projects Lead, WA

Eurofins | Environment Testing
46-48 Banksia Road
WELSHPOOL WA 6106
Australia

Phone: +61 (0)8 9251 9605
Mobile: +61 (0)4 2357 9286

Eurofins Fast TAT Comes to Perth
Eurofins Perth has expanded the locally accredited **Fast TAT** services on offer.

Eurofins acquires ARL Group

From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Wednesday, 29 September 2021 11:43
To: Robert Johnston <RobertJohnston@eurofins.com>; Matthew Deaves <MatthewDeaves@eurofins.com>
Cc: Riley Martin <RMartin@lwconsulting.com.au>
Subject: Revised COC for Test pit samples on HOLD form 26 August

EXTERNAL EMAIL*

Hi All,

Please find the revised COC for the samples that were on hold from 26 August.

There should be 59 samples selected for Eurofins to analyse with 4 samples to go to the chemistry centre if they haven't already.

Kind regards,

Karen

Dr Karen Mackenzie | Principal Geochemist

Land & Water Consulting
Core Innovation Hub, Level Seven,
191 St Georges Terrace, Perth, WA 6000

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP195	ASS1	21.9.21	0.00	soil	1	1					
TP195	ASS2	21.9.21	1.80	soil	1	1					
TP194	ASS1	21.9.21	0.00	soil	1	1					
TP194	ASS2	21.9.21	1.65	soil	1	1					
TP193	ASS1	21.9.21	0.00	soil	1	1					
TP193	ASS2	21.9.21	2.20	soil	1	1					
TP192	ASS1	21.9.21	0.00	soil	1	1					
TP192	ASS2	21.9.21	1.70	soil	1	1					
TP212	ASS1	21.9.21	0.00	soil	1	1					
TP212	ASS2	21.9.21	1.45	soil	1	1					
TP213	ASS1	21.9.21	0.00	soil	1	1					
TP213	ASS2	21.9.21	1.50	soil	1	1					
TP214	ASS1	21.9.21	0.00	soil	1	1					
TP214	ASS2	21.9.21	2.00	soil	1	1					
TP215	ASS1	21.9.21	0.00	soil	1	1					
TP215	ASS2	21.9.21	1.20	soil	1	1					
TP216	ASS1	21.9.21	0.00	soil	1	1					
TP216	ASS2	21.9.21	1.75	soil	1	1					
TP217	ASS1	21.9.21	0.00	soil	1	1					
TP217	ASS2	21.9.21	1.95	soil	1	1					
			TOTAL	0	20	20					

ADDITIONAL COMMENTS:

829368

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP001	ASS1	22.9.21	0.00	Soil	1	1					
TP001	ASS2	22.9.21	1.80	Soil	1	1					
TP204	ASS1	22.9.21	0.00	Soil	1	1					
TP204	ASS2	22.9.21	2.50	Soil	1	1					
TP205	ASS1	22.9.21	0.00	Soil	1	1					
TP205	ASS2	22.9.21	2.30	Soil	1	1					
TP206	ASS1	22.9.21	0.00	Soil	1	1					
TP206	ASS2	22.9.21	1.80	Soil	1	1					
TP207	ASS1	22.9.21	0.00	Soil	1	1					
TP207	ASS2	22.9.21	1.70	Soil	1	1					
TP208	ASS1	22.9.21	0.00	Soil	1	1					
TP208	ASS2	22.9.21	1.40	Soil	1	1					
TP196	ASS1	22.9.21	0.00	Soil	1	1					
TP196	ASS2	22.9.21	2.00	Soil	1	1					
TP209	ASS1	22.9.21	0.00	Soil	1	1					
TP209	ASS2	22.9.21	1.65	Soil	1	1					
TP210	ASS1	22.9.21	0.00	Soil	1	1					
TP210	ASS2	22.9.21	1.90	Soil	1	1					
TP211	ASS1	22.9.21	0.00	Soil	1	1					
TP211	ASS2	22.9.21	2.30	Soil	1	1					
			TOTAL	0	20	20					

ADDITIONAL COMMENTS:

829368

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP284	ASS1	23.9.21	0.00	Soil	1	1					
TP284	ASS2	23.9.21	3.10	Soil	1	1					
TP115	ASS1	23.9.21	0.00	Soil	1	1					
TP115	ASS2	23.9.21	2.00	Soil	1	1					
TP122	ASS1	23.9.21	0.00	Soil	1	1					
TP122	ASS2	23.9.21	1.30	Soil	1	1					
			TOTAL	0	6	6					

ADDITIONAL COMMENTS:

829368

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Attention: **Karen Mackenzie**

Report **829438-S**
Project name ALGAL MAT
Project ID W-AO
Received Date Sep 29, 2021

Client Sample ID			**SSA058_0-50_08.8.21**	**SSA058_100-150_08.8.21**	**SSA093_100-150_08.8.21**	**SSA097_25-75_11.8.21**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05814**	**L21-Oc05815**	**L21-Oc05816**	**L21-Oc05817**
Date Sampled			**Aug 08, 2021**	**Aug 08, 2021**	**Aug 08, 2021**	**Aug 11, 2021**
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	24000	6000	17000	22000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	25000	4500	8800	11000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	7.9	9.1	8.7	8.7
Sulphate (as SO4)	30	mg/kg	2200	610	1500	2300
Total Kjeldahl Nitrogen (as N)	10	mg/kg	320	< 10	50	60
Total Nitrogen (as N)*	10	mg/kg	320	< 10	50	60
Total Organic Carbon	0.1	%	0.9	4.0	1.2	2.1
Phosphorus	5	mg/kg	160	< 100	370	300
% Moisture	1	%	28	4.5	17	22
Heavy Metals						
Aluminium	20	mg/kg	9800	3200	11000	7300
Iron	20	mg/kg	23000	19000	45000	14000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	41	25	37	39
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	5	mg/kg	62000	75000	82000	100000
Magnesium	5	mg/kg	27000	4900	53000	35000
Potassium	5	mg/kg	2800	390	2200	2100
Sodium	5	mg/kg	64000	3300	23000	19000
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	12	9.6	11	12
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	11	8.0	9.5	10
Reaction Ratings*[S05]	0	-	5.6	2.1	2.4	2.6

Client Sample ID			SSA094_100-150_11.8.21	SSA099_60-80_12.8.21	SSA089_100-150_13.8.21	SSA069_100-150_23.09.21
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05818**	**L21-Oc05819**	**L21-Oc05820**	**L21-Oc05821**
Date Sampled			**Aug 11, 2021**	**Aug 12, 2021**	**Aug 13, 2021**	**Sep 23, 2021**
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	17000	15000	18000	32000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	8400	11000	6200	15000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.8	8.8	8.8	8.4
Sulphate (as SO4)	30	mg/kg	1600	1000	1800	1300
Total Kjeldahl Nitrogen (as N)	10	mg/kg	51	110	290	37
Total Nitrogen (as N)*	10	mg/kg	51	110	290	37
Total Organic Carbon	0.1	%	< 0.1	1.2	0.7	0.2
Phosphorus	5	mg/kg	310	220	660	290
% Moisture	1	%	20	18	29	16
Heavy Metals						
Aluminium	20	mg/kg	9300	11000	25000	26000
Iron	20	mg/kg	24000	30000	46000	53000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	47	40	41	55
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	5	mg/kg	96000	110000	76000	23000
Magnesium	5	mg/kg	45000	23000	47000	13000
Potassium	5	mg/kg	2300	2000	5400	5700
Sodium	5	mg/kg	17000	17000	22000	22000
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	11	11	13	10
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.9	9.5	12	10
Reaction Ratings*[S05]	0	-	2.5	2.4	2.8	4.8

Client Sample ID			SSA113_100-150_23.09.21	SSA082_100-150_24.09.21	SSA014_100-150_24.09.21	SSA075_100-150_24.09.21
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05822**	**L21-Oc05823**	**L21-Oc05824**	**L21-Oc05825**
Date Sampled			**Sep 23, 2021**	**Sep 24, 2021**	**Sep 24, 2021**	**Sep 24, 2021**
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	30000	7400	7300	7800
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	14000	5600	5700	7900
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.6	8.3	8.7	8.4
Sulphate (as SO4)	30	mg/kg	2500	630	670	250
Total Kjeldahl Nitrogen (as N)	10	mg/kg	92	13	100	< 10
Total Nitrogen (as N)*	10	mg/kg	92	13	100	< 10
Total Organic Carbon	0.1	%	0.6	0.4	0.5	0.5
Phosphorus	5	mg/kg	170	190	190	< 100
% Moisture	1	%	27	14	21	17
Heavy Metals						
Aluminium	20	mg/kg	3900	8400	11000	12000
Iron	20	mg/kg	13000	29000	25000	25000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	47	29	32	61

Client Sample ID			SSA113_100-150_23.09.21	SSA082_100-150_24.09.21	SSA014_100-150_24.09.21	SSA075_100-150_24.09.21
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc05822**	**L21-Oc05823**	**L21-Oc05824**	**L21-Oc05825**
Date Sampled			**Sep 23, 2021**	**Sep 24, 2021**	**Sep 24, 2021**	**Sep 24, 2021**
Test/Reference	LOR	Unit				
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	5	mg/kg	10000	1800	9700	4500
Magnesium	5	mg/kg	19000	16000	16000	5000
Potassium	5	mg/kg	770	1400	1700	1100
Sodium	5	mg/kg	9500	9000	7900	3700
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	12	10	11	10
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	11	10.0	11	11
Reaction Ratings*[S05]	0	-	2.7	4.7	5.1	4.8

Client Sample ID			SSA005_100-150_24.09.21
Sample Matrix			**Soil**
Eurofins Sample No.			**L21-Oc05826**
Date Sampled			**Sep 24, 2021**
Test/Reference	LOR	Unit	
Chloride	5	mg/kg	6300
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	3800
Nitrate & Nitrite (as N)	5	mg/kg	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.5
Sulphate (as SO4)	30	mg/kg	880
Total Kjeldahl Nitrogen (as N)	10	mg/kg	140
Total Nitrogen (as N)*	10	mg/kg	140
Total Organic Carbon	0.1	%	0.3
Phosphorus	5	mg/kg	< 100
% Moisture	1	%	17
Heavy Metals			
Aluminium	20	mg/kg	14000
Iron	20	mg/kg	37000
Cation Exchange Capacity			
Cation Exchange Capacity	0.05	meq/100g	30
Eurofins Suite B11C: Na/K/Ca/Mg			
Calcium	5	mg/kg	1800
Magnesium	5	mg/kg	7200
Potassium	5	mg/kg	1500
Sodium	5	mg/kg	3800
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	10
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	11
Reaction Ratings*[S05]	0	-	4.8

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Melbourne	Oct 06, 2021	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Oct 06, 2021	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Sulphate (as SO4)	Melbourne	Oct 06, 2021	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Total Organic Carbon	Melbourne	Oct 06, 2021	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Phosphorus	Melbourne	Oct 06, 2021	180 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
Heavy Metals	Melbourne	Oct 06, 2021	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Melbourne	Oct 06, 2021	180 Days
- Method: LTM-MET-3010 Alkali Metals by ICP-AES			
Acid Sulfate Soils Field pH Test	Welshpool	Oct 04, 2021	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Oct 06, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Oct 07, 2021	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Oct 06, 2021	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Oct 06, 2021	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
% Moisture	Melbourne	Oct 04, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: LWC Management Pty Ltd
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Project Name: ALGAL MAT
Project ID: W-AO

Order No.:
Report #: 829438
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
Due: Oct 6, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Aluminium	Chloride	HOLD	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Phosphorus	Sulphate (as SO4)	Total Organic Carbon	Acid Sulfate Soils Field pH Test	Total Nitrogen Set (as N)	Moisture Set	Cation Exchange Capacity	Eurofins Suite B11C: Na/K/Ca/Mg
Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SSA058_0-50_08.8.21	Aug 08, 2021		Soil	L21-Oc05814	X	X		X	X	X	X	X	X	X	X	X	X
2	SSA058_100-150_08.8.21	Aug 08, 2021		Soil	L21-Oc05815	X	X		X	X	X	X	X	X	X	X	X	X
3	SSA093_100-150_08.8.21	Aug 08, 2021		Soil	L21-Oc05816	X	X		X	X	X	X	X	X	X	X	X	X
4	SSA097_25-75_11.8.21	Aug 11, 2021		Soil	L21-Oc05817	X	X		X	X	X	X	X	X	X	X	X	X
5	SSA094_100-150_11.8.21	Aug 11, 2021		Soil	L21-Oc05818	X	X		X	X	X	X	X	X	X	X	X	X
6	SSA099_60-	Aug 12, 2021		Soil	L21-Oc05819	X	X		X	X	X	X	X	X	X	X	X	X

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Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
	80_12.8.21																	
7	SSA089_100-150_13.8.21	Aug 13, 2021		Soil	L21-Oc05820	X	X		X	X	X	X	X	X	X	X	X	X
8	SSA069_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05821	X	X		X	X	X	X	X	X	X	X	X	X
9	SSA113_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05822	X	X		X	X	X	X	X	X	X	X	X	X
10	SSA082_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05823	X	X		X	X	X	X	X	X	X	X	X	X
11	SSA014_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05824	X	X		X	X	X	X	X	X	X	X	X	X
12	SSA075_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05825	X	X		X	X	X	X	X	X	X	X	X	X

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Sample Detail						Aluminium	Chloride	HOLD	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Phosphorus	Sulphate (as SO4)	Total Organic Carbon	Acid Sulfate Soils Field pH Test	Total Nitrogen Set (as N)	Moisture Set	Cation Exchange Capacity	Eurofins Suite B11C: Na/K/Ca/Mg
Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
13	SSA005_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05826	X	X		X	X	X	X	X	X	X	X	X	X
14	SSA068_50-100_08.8.21	Aug 08, 2021		Soil	L21-Oc05827			X										
15	SSA001_50-100_08.8.21	Aug 08, 2021		Soil	L21-Oc05828			X										
16	SSA091_100-150_08.8.21	Aug 08, 2021		Soil	L21-Oc05829			X										
17	SSA092_100-150_08.8.21	Aug 08, 2021		Soil	L21-Oc05830			X										
18	SSA061_100-150_08.8.21	Aug 08, 2021		Soil	L21-Oc05831			X										
19	SSA062_100-	Aug 08, 2021		Soil	L21-Oc05832			X										

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Sample Detail						Aluminium	Chloride	HOLD	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Phosphorus	Sulphate (as SO4)	Total Organic Carbon	Acid Sulfate Soils Field pH Test	Total Nitrogen Set (as N)	Moisture Set	Cation Exchange Capacity	Eurofins Suite B11C: Na/K/Ca/Mg
Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
	150_08.8.21																	
20	SSA117_100-150_11.8.21	Aug 11, 2021		Soil	L21-Oc05833			X										
21	SSA057_100-150_11.8.21	Aug 11, 2021		Soil	L21-Oc05834			X										
22	SSA002_100-150_11.8.21	Aug 11, 2021		Soil	L21-Oc05835			X										
23	SSA095_50-100_11.8.21	Aug 11, 2021		Soil	L21-Oc05836			X										
24	SSA096_50-100_11.8.21	Aug 11, 2021		Soil	L21-Oc05837			X										
25	SSA102_100-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05838			X										

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Sample Detail						Aluminium	Chloride	HOLD	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Phosphorus	Sulphate (as SO4)	Total Organic Carbon	Acid Sulfate Soils Field pH Test	Total Nitrogen Set (as N)	Moisture Set	Cation Exchange Capacity	Eurofins Suite B11C: Na/K/Ca/Mg
Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
26	SSA026_100-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05839			X										
27	SSA025_100-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05840			X										
28	SSA101_100-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05841			X										
29	SSA050_100-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05842			X										
30	SSA022_100-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05843			X										
31	SSA103_60-100_12.8.21	Aug 12, 2021		Soil	L21-Oc05844			X										
32	SSA051_50-	Aug 12, 2021		Soil	L21-Oc05845			X										

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Project Name: ALGAL MAT
Project ID: W-AO

Order No.:
Report #: 829438
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
Due: Oct 6, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Aluminium	Chloride	HOLD	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Phosphorus	Sulphate (as SO4)	Total Organic Carbon	Acid Sulfate Soils Field pH Test	Total Nitrogen Set (as N)	Moisture Set	Cation Exchange Capacity	Eurofins Suite B11C: Na/K/Ca/Mg
Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
	90_12.8.21																	
33	SSA024_100-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05846			X										
34	SSA054_75-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05847			X										
35	SSA098_60-70_12.8.21	Aug 12, 2021		Soil	L21-Oc05848			X										
36	SSA100_50-100_12.8.21	Aug 12, 2021		Soil	L21-Oc05849			X										
37	SSA23_100-150_12.8.21	Aug 12, 2021		Soil	L21-Oc05850			X										
38	SSA087_70-100_13.8.21	Aug 13, 2021		Soil	L21-Oc05851			X										

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Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
39	SSA084_70-100_13.8.21	Aug 13, 2021		Soil	L21-Oc05852			X										
40	SSA027_100-150_13.8.21	Aug 13, 2021		Soil	L21-Oc05853			X										
41	SSA088_No depth written_13.8.21	Aug 13, 2021		Soil	L21-Oc05854			X										
42	SSA086_100-150_13.8.21	Aug 13, 2021		Soil	L21-Oc05855			X										
43	SSA085_100-150_13.8.21	Aug 13, 2021		Soil	L21-Oc05856			X										
44	SSA017_100-	Sep 23, 2021		Soil	L21-Oc05857			X										

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Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
	150_23.09.21																	
45	SSA016_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05858			X										
46	SSA015_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05859			X										
47	SSA107_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05860			X										
48	SSA108_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05861			X										
49	SSA109_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05862			X										
50	SSA110_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05863			X										

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																		
Brisbane Laboratory - NATA # 1261 Site # 20794																		
Mayfield Laboratory - NATA # 1261 Site # 25079																		
External Laboratory																		
51	SSA111_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05864			X										
52	SSA112_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05865			X										
53	SSA114_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05866			X										
54	SSA115_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05867			X										
55	SSA116_100-150_23.09.21	Sep 23, 2021		Soil	L21-Oc05868			X										
56	SSA021_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05869			X										
57	SSA103_100-	Sep 24, 2021		Soil	L21-Oc05870			X										

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Perth Laboratory - NATA # 2377 Site # 2370								X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X		X	X	X	X	X		X	X	X	X
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External Laboratory																		
	150_24.09.21																	
58	SSA011_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05871			X										
59	SSA012_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05872			X										
60	SSA013_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05873			X										
61	SSA073_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05874			X										
62	SSA077_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05875			X										
63	SSA006_100-150_24.09.21	Sep 24, 2021		Soil	L21-Oc05876			X										

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Perth Laboratory - NATA # 2377 Site # 2370			X						X				
Melbourne Laboratory - NATA # 1261 Site # 1254	X	X		X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217													
Brisbane Laboratory - NATA # 1261 Site # 20794													
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External Laboratory													
Test Counts	13	13	50	13	13	13	13	13	13	13	13	13	13

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 5			5	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/kg	< 5			5	Pass	
Sulphate (as SO4)	mg/kg	< 30			30	Pass	
Phosphorus	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/kg	< 20			20	Pass	
Iron	mg/kg	< 20			20	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/kg	< 5			5	Pass	
Magnesium	mg/kg	< 5			5	Pass	
Potassium	mg/kg	< 5			5	Pass	
Sodium	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Chloride	%	101			70-130	Pass	
Nitrate & Nitrite (as N)	%	106			70-130	Pass	
Sulphate (as SO4)	%	112			70-130	Pass	
Total Organic Carbon	%	99			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium	%	109			80-120	Pass	
Iron	%	114			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	M21-Oc09003	NCP	%	90			75-125	Pass	
Iron	M21-Oc09003	NCP	%	119			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	M21-Oc00717	NCP	mg/kg	9200	9100	1.0	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	M21-Oc07587	NCP	uS/cm	63	74	17	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M21-Oc07587	NCP	pH Units	9.0	9.0	pass	30%	Pass	
Sulphate (as SO4)	M21-Oc02455	NCP	mg/kg	< 30	< 30	<1	30%	Pass	
% Moisture	L21-Oc05806	NCP	%	3.0	3.0	2.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	M21-Oc09353	NCP	mg/kg	51000	51000	<1	30%	Pass	
Iron	M21-Oc09353	NCP	mg/kg	45000	45000	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L21-Oc05816	CP	mg/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc05816	CP	pH Units	11	11	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc05816	CP	pH Units	9.5	9.5	pass	30%	Pass	
Reaction Ratings*	L21-Oc05816	CP	-	2.4	2.4	pass	30%	Pass	
Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	L21-Oc05819	CP	meq/100g	40	31	25	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	L21-Oc05824	CP	%	0.5	0.5	4.4	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc05824	CP	pH Units	11	11	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc05824	CP	pH Units	11	11	pass	30%	Pass	
Reaction Ratings*	L21-Oc05824	CP	-	5.1	5.1	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L21-Oc05826	CP	mg/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Robert Johnston	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)

Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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IANZ# 1290

Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Karen Mackenzie
Project name:	ALGAL MAT
Project ID:	W-AO
Turnaround time:	5 Day
Date/Time received	Sep 29, 2021 2:08 PM
Eurofins reference	829438

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Rhys Thomas on phone : or by email:

Results will be delivered electronically via email to Karen Mackenzie - kmackenzie@lwconsulting.com.au.

Global Leader - Results you can trust

Robert Johnston

From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Wednesday, 29 September 2021 11:21
To: Robert Johnston; Matthew Deaves
Cc: Riley Martin
Subject: LWC job number W-AO Chain of custody
Attachments: ALGAL MAT_COC1.xlsx; ALGAL MAT_Chain of Custody No.2.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL*

Hi Rob and Mat,

Please find attached the chain of custody for some of the samples received this week from Karratha.

I'll keep them coming as I finalise them.

Cheers,

Karen

Caitlyn Gibson @ Eurofins # 829438

Date/Time: 29/9/21 2:08
Chilled: Yes / No
Temp: 15.4 16.6 16.6 15.3 12.5
16.3 11.9 14.2 13.8
12.4 12.6 14.4 14.8
Correction: -0.3
Final Temp: 14°C

Dr Karen Mackenzie | Principal Geochemist

Land & Water Consulting
Core Innovation Hub, Level Seven,
191 St Georges Terrace, Perth, WA 6000
M: +61 448 682 774
kmackenzie@lwconsulting.com.au | www.lwconsulting.com.au

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SAMPLE CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (mm)	Matrix	pH and EC 1:5 extract	Total Chloride (1:5 extract)	water soluble sulfate (1:5 extract)	TOC	CEC	TN	TP
SSA068		08.8.21	50-100	Sediment							
SSA058		08.8.21	0-50	Sediment	✓	✓	✓	✓	✓	✓	✓
SSA058		08.8.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓
SSA001		08.8.21	50-100	Sediment							
SSA093		08.8.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓
SSA091		08.8.21	100-150	Sediment							
SSA092		08.8.21	100-150	Sediment							
SSA061		08.8.21	100-150	Sediment							
SSA062		08.8.21	100-150	Sediment							
SSA117		11.8.21	100-150	Sediment							
SSA057		11.8.21	100-150	Sediment							
SSA097		11.8.21	25-75	Sediment	✓	✓	✓	✓	✓	✓	✓
SSA002		11.8.21	100-150	Sediment							
SSA095		11.8.21	50-100	Sediment							
SSA096		11.8.21	50-100	Sediment							
SSA094		11.8.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓
SSA102		12.8.21	100-150	Sediment							
SSA026		12.8.21	100-150	Sediment							
SSA025		12.8.21	100-150	Sediment							
SSA101		12.8.21	100-150	Sediment							
SSA050		12.8.21	100-150	Sediment							
SSA022		12.8.21	100-150	Sediment							
SSA103		12.8.21	60-100	Sediment							
SSA099		12.8.21	60-80	Sediment	✓	✓	✓	✓	✓	✓	✓
SSA051		12.8.21	50-90	Sediment							
SSA024		12.8.21	100-150	Sediment							
SSA054		12.8.21	75-150	Sediment							
SSA098		12.8.21	60-70	Sediment							
SSA100		12.8.21	50-100	Sediment							
SSA23		12.8.21	100-150	Sediment							
SSA088		13.8.21	70-100	Sediment	RELABEL AS SSA087 70-100mm						
SSA084		13.8.21	70-100	Sediment							
SSA087		13.8.21	100-150	Sediment	RELABEL AS SSA027 100-150mm						
SSA089		13.8.21	No depth written	Sediment	RELABEL AS SSA088 100-150mm						
SSA089		13.8.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓
SSA086		13.8.21	100-150	Sediment							
SSA085		13.8.21	100-150	Sediment							
			TOTAL	0	7	7	7	7	7	7	7

ADDITIONAL COMMENTS:

Depths labelled on bags 829438

SAMPLE MANIFEST

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (mm)	Matrix	pH and EC 1:5 extract	Total Chloride (1:5 extract)	water soluble sulfate (1:5 extract)	TOC	CEC	TN	TP	Metals: Al, Fe, Na, K, Ca and Mg	pHf and pHfox
SSA069		23.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA017		23.09.21	100-150	Sediment									
SSA016		23.09.21	100-150	Sediment									
SSA015		23.09.21	100-150	Sediment									
SSA107		23.09.21	100-150	Sediment									
SSA108		23.09.21	100-150	Sediment									
SSA109		23.09.21	100-150	Sediment									
SSA110		23.09.21	100-150	Sediment									
SSA111		23.09.21	100-150	Sediment									
SSA112		23.09.21	100-150	Sediment									
SSA113		23.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA114		23.09.21	100-150	Sediment									
SSA115		23.09.21	100-150	Sediment									
SSA116		23.09.21	100-150	Sediment									
SSA021		24.09.21	100-150	Sediment									
SSA082		24.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA103		24.09.21	100-150	Sediment									
SSA011		24.09.21	100-150	Sediment									
SSA012		24.09.21	100-150	Sediment									
SSA013		24.09.21	100-150	Sediment									
SSA014		24.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA073		24.09.21	100-150	Sediment									
SSA075		24.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA077		24.09.21	100-150	Sediment									
SSA005		24.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA006		24.09.21	100-150	Sediment									

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Attention: **Karen Mackenzie**

Report **829534-S**
Project name
Project ID W-AO
Received Date Sep 29, 2021

Client Sample ID			**ASS1_0_26.8.21_TP038**	**ASS2_1.8_26.8.21_TP038**	**ASS1_0_26.8.21_TP039**	**ASS2_2.1_26.8.21_TP039**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06745**	**L21-Oc06746**	**L21-Oc06747**	**L21-Oc06748**
Date Sampled			**Aug 26, 2021**	**Aug 26, 2021**	**Aug 26, 2021**	**Aug 26, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	10	9.6	10
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	10	10	10	10
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			**ASS1_0_26.8.21_TP040**	**ASS2_2.1_26.8.21_TP040**	**ASS1_0_26.8.21_TP044**	**ASS2_2.6_26.8.21_TP044**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06749**	**L21-Oc06750**	**L21-Oc06751**	**L21-Oc06752**
Date Sampled			**Aug 26, 2021**	**Aug 26, 2021**	**Aug 26, 2021**	**Aug 26, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.2	10	9.7	10
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	10	9.8	11
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			**ASS1_0_26.8.21_TP050**	**ASS2_2_26.8.21_TP050**	**ASS1_0_26.8.21_TP043**	**ASS2_3_26.8.21_TP043**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06753**	**L21-Oc06754**	**L21-Oc06755**	**L21-Oc06756**
Date Sampled			**Aug 26, 2021**	**Aug 26, 2021**	**Aug 26, 2021**	**Aug 26, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.4	9.4	10
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.7	9.5	9.5	10
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_27.8.21_TP036	ASS1_0_27.8.21_TP037	ASS2_3_27.8.21_TP037	ASS1_0_27.8.21_TP046
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-Oc06757	L21-Oc06758	L21-Oc06759	L21-Oc06760
Date Sampled			Aug 27, 2021	Aug 27, 2021	Aug 27, 2021	Aug 27, 2021
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.9	9.4	9.7	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.8	9.6	10	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.3_27.8.21_TP046	ASS1_0_27.8.21_TP047	ASS2_2_27.8.21_TP047	ASS4_0_27.8.21_TP036
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-Oc06761	L21-Oc06762	L21-Oc06763	L21-Oc06764
Date Sampled			Aug 27, 2021	Aug 27, 2021	Aug 27, 2021	Aug 27, 2021
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.3	10	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.5	9.7	10	9.0
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_29.8.21_TP080	ASS2_2.2_29.8.21_TP080	ASS1_0_29.8.21_TP081	ASS2_2.3_29.8.21_TP081
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-Oc06765	L21-Oc06766	L21-Oc06767	L21-Oc06768
Date Sampled			Aug 29, 2021	Aug 29, 2021	Aug 29, 2021	Aug 29, 2021
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	8.9	8.8	9.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.0	8.3	7.6	9.2
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_29.8.21_TP085	ASS4_2.6_29.8.21_TP085	ASS1_0_29.8.21_TP086	ASS2_1.6_29.8.21_TP086
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-Oc06769	L21-Oc06770	L21-Oc06771	L21-Oc06772
Date Sampled			Aug 29, 2021	Aug 29, 2021	Aug 29, 2021	Aug 29, 2021
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.2	9.9	9.2	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	10	9.3	9.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_29.8.21_TP087	ASS4_1.6_29.8.21_TP087	ASS1_0_29.8.21_TP090	ASS2_2.2_29.8.21_TP090
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06773**	**L21-Oc06774**	**L21-Oc06775**	**L21-Oc06776**
Date Sampled			**Aug 29, 2021**	**Aug 29, 2021**	**Aug 29, 2021**	**Aug 29, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	8.8	9.2	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.3	8.9	9.1	9.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_29.8.21_TP092	ASS2_2.2_29.8.21_TP092	ASS1_0_29.8.21_TP095	ASS2_1.9_29.8.21_TP095
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06777**	**L21-Oc06778**	**L21-Oc06779**	**L21-Oc06780**
Date Sampled			**Aug 29, 2021**	**Aug 29, 2021**	**Aug 29, 2021**	**Aug 29, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.2	9.7	9.1	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.8	9.8	9.3	9.2
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_29.8.21_TP096	ASS2_2_29.8.21_TP096	ASS2_0_29.8.21_TP085	ASS2_0_29.8.21_TP087
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06781**	**L21-Oc06782**	**L21-Oc06783**	**L21-Oc06784**
Date Sampled			**Aug 29, 2021**	**Aug 29, 2021**	**Aug 29, 2021**	**Aug 29, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.4	9.6	9.0	9.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.5	9.8	9.1	8.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_31.8.21_TP082	ASS4_2.4_31.8.21_TP082	ASS1_0_31.8.21_TP083	ASS2_1.5_31.8.21_TP083
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06785**	**L21-Oc06786**	**L21-Oc06787**	**L21-Oc06788**
Date Sampled			**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.0	7.7	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.2	9.1	7.0	9.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_31.8.21_TP145	ASS2_1.7_31.8.21_TP145	ASS1_0_31.8.21_TP186	ASS2_2_31.8.21_TP186
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06789**	**L21-Oc06790**	**L21-Oc06791**	**L21-Oc06792**
Date Sampled			**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.8	9.2	10
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.3	9.8	9.6	11
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_31.8.21_TP187	ASS2_2.1_31.8.21_TP187	ASS1_0_31.8.21_TP188	ASS2_2.4_31.8.21_TP188
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06793**	**L21-Oc06794**	**L21-Oc06795**	**L21-Oc06796**
Date Sampled			**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.3	9.6	9.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.6	9.3	9.6	9.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_31.8.21_TP189	ASS4_1.5_31.8.21_TP189	ASS1_0_31.8.21_TP190	ASS2_2.3_31.8.21_TP190
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06797**	**L21-Oc06798**	**L21-Oc06799**	**L21-Oc06800**
Date Sampled			**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**	**Aug 31, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.7	9.1	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.8	9.6	9.4	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_0_31.8.21_TP082	ASS1_0_01.9.21_TP185	ASS2_2.7_01.9.21_TP185	ASS1_0_01.9.21_TP191
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06801**	**L21-Oc06803**	**L21-Oc06804**	**L21-Oc06805**
Date Sampled			**Aug 31, 2021**	**Sep 01, 2021**	**Sep 01, 2021**	**Sep 01, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.1	9.6	9.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.5	9.0	8.1	9.0
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS4_2.4_01.9.21_TP191	ASS2_0_01.9.21_TP191	ASS1_0_06.9.21_TP008	ASS2_2.1_06.9.21_TP008
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06806**	**L21-Oc06807**	**L21-Oc06808**	**L21-Oc06809**
Date Sampled			**Sep 01, 2021**	**Sep 01, 2021**	**Sep 06, 2021**	**Sep 06, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.0	9.2	9.3	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.2	9.3	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_06.9.21_TP007	ASS2_1.9_06.9.21_TP007	ASS1_0_06.9.21_TP006	ASS2_2.1_06.9.21_TP006
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06810**	**L21-Oc06811**	**L21-Oc06812**	**L21-Oc06813**
Date Sampled			**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.5	8.9	8.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.3	9.2	9.1	8.8
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_06.9.21_TP005	ASS2_0.5_06.9.21_TP005	ASS3_1_06.9.21_TP005	ASS4_1.5_06.9.21_TP005
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06814**	**L21-Oc06815**	**L21-Oc06816**	**L21-Oc06817**
Date Sampled			**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.7	8.9	7.8	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.0	8.7	9.3	9.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS5_2_06.9.21_TP005	ASS6_2.5_06.9.21_TP005	ASS1_0_06.9.21_TP163	ASS2_1.5_06.9.21_TP163
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06818**	**L21-Oc06819**	**L21-Oc06820**	**L21-Oc06821**
Date Sampled			**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.3	9.1	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.5	9.6	9.5	8.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_06.9.21_TP164	ASS2_2.6_06.9.21_TP164	ASS1_0_06.9.21_TP169	ASS4_2_06.9.21_TP169
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06822**	**L21-Oc06823**	**L21-Oc06824**	**L21-Oc06825**
Date Sampled			**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.0	8.1	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.0	8.6	9.2	8.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_06.9.21_TP165	ASS2_3_06.9.21_TP165	ASS1_0_06.9.21_TP153	ASS2_2_06.9.21_TP153
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06826**	**L21-Oc06827**	**L21-Oc06828**	**L21-Oc06829**
Date Sampled			**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**	**Sep 06, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.1	9.1	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.2	9.0	9.4	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS7_2.5_06.9.21_TP005	ASS2_0_06.9.21_TP169	ASS1_0_07.9.21_TP154	ASS2_2_07.9.21_TP154
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06830**	**L21-Oc06831**	**L21-Oc06832**	**L21-Oc06833**
Date Sampled			**Sep 06, 2021**	**Sep 06, 2021**	**Sep 07, 2021**	**Sep 07, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	8.4	9.3	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.4	9.1	9.7	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_07.9.21_TP155	ASS2_3_07.9.21_TP155	ASS1_0_07.9.21_TP156	ASS2_1.8_07.9.21_TP156
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06834**	**L21-Oc06835**	**L21-Oc06836**	**L21-Oc06837**
Date Sampled			**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	9.4	9.5	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.0	9.1	9.8	9.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_07.9.21_TP157	ASS2_0.5_07.9.21_TP157	ASS3_1_07.9.21_TP157	ASS4_1.5_07.9.21_TP157
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06838**	**L21-Oc06839**	**L21-Oc06840**	**L21-Oc06841**
Date Sampled			**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.1	8.8	9.1	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.1	9.2	9.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS5_2_07.9.21_TP157	ASS6_2.5_07.9.21_TP157	ASS7_2.8_07.9.21_TP157	ASS1_0_07.9.21_TP158
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06842**	**L21-Oc06843**	**L21-Oc06844**	**L21-Oc06845**
Date Sampled			**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.2	9.1	9.6	8.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.4	9.5	9.5	8.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_0.5_07.9.21_TP158	ASS3_1_07.9.21_TP158	ASS4_1.2_07.9.21_TP158	ASS1_0_07.9.21_TP159
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06846**	**L21-Oc06847**	**L21-Oc06848**	**L21-Oc06849**
Date Sampled			**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.7	9.6	9.5	8.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.7	9.3	9.3	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_0.5_07.9.21_TP159	ASS3_1_07.9.21_TP159	ASS4_1.5_07.9.21_TP159	ASS5_2_07.9.21_TP159
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06850**	**L21-Oc06851**	**L21-Oc06852**	**L21-Oc06853**
Date Sampled			**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	7.8	7.8	9.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.9	8.8	8.8	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS6_2.4_07.9.21_TP159	ASS1_0_07.9.21_TP160	ASS2_2.1_07.9.21_TP160	ASS1_0_07.9.21_TP009
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06854**	**L21-Oc06855**	**L21-Oc06856**	**L21-Oc06857**
Date Sampled			**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	9.3	8.7	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.4	9.2	8.7	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.1_07.9.21_TP009	ASS1_0_07.9.21_TP010	ASS2_1.9_07.9.21_TP010	ASS1_0_07.9.21_TP011
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06858**	**L21-Oc06859**	**L21-Oc06860**	**L21-Oc06861**
Date Sampled			**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**	**Sep 07, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.2	9.1	9.6	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.9	9.4	9.9	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.7_07.9.21_TP011	ASS1_0_09.9.21_TP182	ASS2_1.2_09.9.21_TP182	ASS1_0_09.9.21_TP180
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06862**	**L21-Oc06863**	**L21-Oc06864**	**L21-Oc06865**
Date Sampled			**Sep 07, 2021**	**Sep 09, 2021**	**Sep 09, 2021**	**Sep 09, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.9	9.6	9.5	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	10.0	9.6	9.7	9.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.8_09.9.21_TP180	ASS1_0_09.9.21_TP168	ASS2_1.7_09.9.21_TP168	ASS1_0_09.9.21_TP152
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06866**	**L21-Oc06867**	**L21-Oc06868**	**L21-Oc06869**
Date Sampled			**Sep 09, 2021**	**Sep 09, 2021**	**Sep 09, 2021**	**Sep 09, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	9.6	8.9	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.7	9.6	8.9	9.2
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.1_09.9.21_TP152	ASS1`_0_09.9.21_TP162	ASS2_1.4_09.9.21_TP162	ASS1_0_09.9.21_TP151
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06870**	**L21-Oc06871**	**L21-Oc06872**	**L21-Oc06873**
Date Sampled			**Sep 09, 2021**	**Sep 09, 2021**	**Sep 09, 2021**	**Sep 09, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.5	9.3	9.5	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.5	9.5	9.5	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.4_09.9.21_TP151	ASS1_0_10.9.21_TP167	ASS2_2.1_10.9.21_TP167	ASS1_0_10.9.21_TP181
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06874**	**L21-Oc06875**	**L21-Oc06876**	**L21-Oc06877**
Date Sampled			**Sep 09, 2021**	**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.8	9.1	9.7	9.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	10	9.3	10	9.8
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS4_2.3_10.9.21_TP181	ASS1_0_10.9.21_TP183	ASS2_1.8_10.9.21_TP183	ASS1_0_10.9.21_TP184
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06878**	**L21-Oc06879**	**L21-Oc06880**	**L21-Oc06881**
Date Sampled			**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.4	8.5	9.3	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.8	8.7	9.3	9.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.5_10.9.21_TP184	ASS1`_0_10.9.21_TP147	ASS2_1.3_10.9.21_TP147	ASS1_0_10.9.21_TP148
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06882**	**L21-Oc06883**	**L21-Oc06884**	**L21-Oc06885**
Date Sampled			**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	9.4	9.7	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.3	9.8	9.2
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.7_10.9.21_TP148	ASS1_0_10.9.21_TP149	ASS2_2.1_10.9.21_TP149	ASS1_0_10.9.21_TP150
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06886**	**L21-Oc06887**	**L21-Oc06888**	**L21-Oc06889**
Date Sampled			**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	9.4	9.3	8.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.0	9.5	9.3	8.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.3_10.9.21_TP150	ASS1_0_10.9.21_TP135	ASS2_0.9_10.9.21_TP135	ASS1_0_10.9.21_TP134
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06890**	**L21-Oc06891**	**L21-Oc06892**	**L21-Oc06893**
Date Sampled			**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.8	9.3	9.6	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.7	9.3	9.6	9.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.8_10.9.21_TP134	ASS1_0_10.9.21_TP133	ASS2_2.2_10.9.21_TP133	ASS2_0_10.9.21_TP181
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06894**	**L21-Oc06895**	**L21-Oc06896**	**L21-Oc06897**
Date Sampled			**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**	**Sep 10, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.8	9.4	9.9	9.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	10	9.4	9.8	9.6
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_11.9.21_TP132	ASS2_1.6_11.9.21_TP132	ASS1_0_11.9.21_TP131	ASS2_1_11.9.21_TP131
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06898**	**L21-Oc06899**	**L21-Oc06900**	**L21-Oc06901**
Date Sampled			**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	9.2	9.1	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.2	9.0	8.7	8.6
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_11.9.21_TP130	ASS2_0.5_11.9.21_TP130	ASS3_1_11.9.21_TP130	ASS4_1.5_11.9.21_TP130
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06902**	**L21-Oc06903**	**L21-Oc06904**	**L21-Oc06905**
Date Sampled			**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	8.7	9.0	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.0	8.8	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS5_2_11.9.21_TP130	ASS1_0_11.9.21_TP012	ASS2_3_11.9.21_TP012	ASS1_0_11.9.21_TP013
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06906**	**L21-Oc06907**	**L21-Oc06908**	**L21-Oc06909**
Date Sampled			**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.1	8.8	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.5	9.3	9.3	9.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_0.7_11.9.21_TP013	ASS1_0_11.9.21_TP014	ASS2_0.9_11.9.21_TP014	ASS1_0_11.9.21_TP015
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06910**	**L21-Oc06911**	**L21-Oc06912**	**L21-Oc06913**
Date Sampled			**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	8.8	9.5	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.9	8.8	9.3	8.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_0.5_11.9.21_TP015	ASS3_1_11.9.21_TP015	ASS4_1.5_11.9.21_TP015	ASS1_0_11.9.21_TP016
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06914**	**L21-Oc06915**	**L21-Oc06916**	**L21-Oc06917**
Date Sampled			**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.8	9.6	9.7	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.7	9.5	9.5	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_0.5_11.9.21_TP016	ASS3_1.1_11.9.21_TP016	ASS4_2.6_11.9.21_TP016	ASS1_0_11.9.21_TP017
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06918**	**L21-Oc06919**	**L21-Oc06920**	**L21-Oc06921**
Date Sampled			**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.9	9.7	9.5	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	10.0	9.5	9.6	8.8
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_0.8_11.9.21_TP017	ASS1_0_11.9.21_TP018	ASS2_3_11.9.21_TP018	ASS1_0_12.9.21_TP019
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06922**	**L21-Oc06923**	**L21-Oc06924**	**L21-Oc06925**
Date Sampled			**Sep 11, 2021**	**Sep 11, 2021**	**Sep 11, 2021**	**Sep 12, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.0	9.5	8.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.3	7.9	7.8	9.2
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.4_12.9.21_TP019	ASS1_0_12.9.21_TP020	ASS2_3.1_12.9.21_TP020	ASS1_0_12.9.21_TP021
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06926**	**L21-Oc06927**	**L21-Oc06928**	**L21-Oc06929**
Date Sampled			**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.3	9.5	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.3	7.9	8.1	7.8
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_3_12.9.21_TP021	ASS1_0_12.9.21_TP022	ASS2_3_12.9.21_TP022	ASS1_0_12.9.21_TP024
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06930**	**L21-Oc06931**	**L21-Oc06932**	**L21-Oc06933**
Date Sampled			**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.9	9.5	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.2	8.6	9.9	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.7_12.9.21_TP024	ASS1_0_12.9.21_TP025	ASS2_3_12.9.21_TP025	ASS1_0_12.9.21_TP026
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06934**	**L21-Oc06935**	**L21-Oc06936**	**L21-Oc06937**
Date Sampled			**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.8	9.7	8.2	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.6	9.5	6.4	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_3_12.9.21_TP026	ASS1_0_12.9.21_TP027	ASS2_2.8_12.9.21_TP027	ASS1_0_12.9.21_TP028
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06938**	**L21-Oc06939**	**L21-Oc06940**	**L21-Oc06941**
Date Sampled			**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.2	9.5	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.7	9.3	9.0	8.6
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.1_12.9.21_TP028	ASS1_0_12.9.21_TP029	ASS2_1.6_12.9.21_TP029	ASS1_0_13.9.21_TP030
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06942**	**L21-Oc06943**	**L21-Oc06944**	**L21-Oc06945**
Date Sampled			**Sep 12, 2021**	**Sep 12, 2021**	**Sep 12, 2021**	**Sep 13, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.8	9.2	9.5	8.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.7	9.5	9.4	7.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.8_13.9.21_TP030	ASS1_0_13.9.21_TP031	ASS2_1.4_13.9.21_TP031	ASS1_0_13.9.21_TP032
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06946**	**L21-Oc06947**	**L21-Oc06948**	**L21-Oc06949**
Date Sampled			**Sep 13, 2021**	**Sep 13, 2021**	**Sep 13, 2021**	**Sep 13, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	8.3	9.8	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.5	6.3	10	6.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_0.9_13.9.21_TP032	ASS1_0_13.9.21_TP033	ASS2_0.8_13.9.21_TP033	ASS1_0_17.9.21_TP274
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06950**	**L21-Oc06951**	**L21-Oc06952**	**L21-Oc06953**
Date Sampled			**Sep 13, 2021**	**Sep 13, 2021**	**Sep 13, 2021**	**Sep 17, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.3	9.6	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	8.2	9.1	8.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.3_17.9.21_TP274	ASS1_0_17.9.21_TP275	ASS2_1_17.9.21_TP275	ASS1_0_17.9.21_TP276
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06954**	**L21-Oc06955**	**L21-Oc06956**	**L21-Oc06957**
Date Sampled			**Sep 17, 2021**	**Sep 17, 2021**	**Sep 17, 2021**	**Sep 17, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	10	9.5	9.6	8.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.2	8.5	9.6	7.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.5_17.9.21_TP276	ASS1_0_17.9.21_TP278	ASS2_2_17.9.21_TP278	ASS1_0_18.9.21_TP136
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06958**	**L21-Oc06959**	**L21-Oc06960**	**L21-Oc06961**
Date Sampled			**Sep 17, 2021**	**Sep 17, 2021**	**Sep 17, 2021**	**Sep 18, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.7	9.3	9.7	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.7	8.8	9.5	7.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2_18.9.21_TP136	ASS1_0_18.9.21_TP137	ASS2_2.2_18.9.21_TP137	ASS1_0_19.9.21_TP004
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06962**	**L21-Oc06963**	**L21-Oc06964**	**L21-Oc06965**
Date Sampled			**Sep 18, 2021**	**Sep 18, 2021**	**Sep 18, 2021**	**Sep 19, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.7	9.2	10	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.3	8.5	10	8.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.6_19.9.21_TP004	ASS1_0_19.9.21_TP170	ASS2_2.2_19.9.21_TP170	ASS1_0_19.9.21_TP171
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06966**	**L21-Oc06967**	**L21-Oc06968**	**L21-Oc06969**
Date Sampled			**Sep 19, 2021**	**Sep 19, 2021**	**Sep 19, 2021**	**Sep 19, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	9.0	8.9	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.1	9.0	8.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.4_19.9.21_TP171	ASS1_0_19.9.21_TP172	ASS2_2.5_19.9.21_TP172	ASS1_0_19.9.21_TP173
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06970**	**L21-Oc06971**	**L21-Oc06972**	**L21-Oc06973**
Date Sampled			**Sep 19, 2021**	**Sep 19, 2021**	**Sep 19, 2021**	**Sep 19, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	8.6	8.5	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	8.6	8.8	8.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.4_19.9.21_TP173	ASS1_0_19.9.21_TP174	ASS2_1.6_19.9.21_TP174	ASS1_0_19.9.21_TP175
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06974**	**L21-Oc06975**	**L21-Oc06976**	**L21-Oc06977**
Date Sampled			**Sep 19, 2021**	**Sep 19, 2021**	**Sep 19, 2021**	**Sep 19, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	8.8	8.3	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.8	8.7	8.7	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.1_19.9.21_TP175	ASS1_0_19.9.21_TP176	ASS2_1.4_19.9.21_TP176	ASS1_0_19.9.21_TP177
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06978**	**L21-Oc06979**	**L21-Oc06980**	**L21-Oc06981**
Date Sampled			**Sep 19, 2021**	**Sep 19, 2021**	**Sep 19, 2021**	**Sep 19, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	8.8	8.8	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.1	9.0	9.0
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_2.3_19.9.21_TP177	ASS1_0_20.9.21_TP002	ASS2_1.4_20.9.21_TP002	ASS1_0_20.9.21_TP003
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06982**	**L21-Oc06983**	**L21-Oc06984**	**L21-Oc06985**
Date Sampled			**Sep 19, 2021**	**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.4	9.2	8.7	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.9	9.1	9.0	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.9_20.9.21_TP003	ASS1_0_20.9.21_TP178	ASS2_1.5_20.9.21_TP178	ASS1_0_20.9.21_TP179
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06986**	**L21-Oc06987**	**L21-Oc06988**	**L21-Oc06989**
Date Sampled			**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	8.8	8.7	9.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.2	8.8	8.6	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.4_20.9.21_TP179	ASS1_0_20.9.21_TP197	ASS2_1.7_20.9.21_TP197	ASS1_0_20.9.21_TP198
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06990**	**L21-Oc06991**	**L21-Oc06992**	**L21-Oc06993**
Date Sampled			**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.7	9.0	9.4	9.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.8	8.8	9.2	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_1.5_20.9.21_TP198	ASS4_3_27.8.21_TP036
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc06994**	**L21-Oc07012**
Date Sampled			**Sep 20, 2021**	**Aug 27, 2021**
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	8.4	9.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.5	10.0
Reaction Ratings*[S05]	0	-	4.0	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acid Sulfate Soils Field pH Test	Welshpool	Oct 05, 2021	7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

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Received: Sep 29, 2021 2:08 PM
Due: Oct 13, 2021
Priority: 10 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	ASS1_0_26.8.21_TP038	Aug 26, 2021		Soil	L21-Oc06745		X
2	ASS2_1.8_26.8.21_TP038	Aug 26, 2021		Soil	L21-Oc06746		X
3	ASS1_0_26.8.21_TP039	Aug 26, 2021		Soil	L21-Oc06747		X
4	ASS2_2.1_26.8.21_TP039	Aug 26, 2021		Soil	L21-Oc06748		X
5	ASS1_0_26.8.21_TP040	Aug 26, 2021		Soil	L21-Oc06749		X
6	ASS2_2.1_26.	Aug 26, 2021		Soil	L21-Oc06750		X

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Company Name: LWC Management Pty Ltd
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Project Name:
Project ID: W-AO

Order No.: W-AO
Report #: 829534
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
Due: Oct 13, 2021
Priority: 10 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	8.21_TP040						
7	ASS1_0_26.8.21_TP044	Aug 26, 2021		Soil	L21-Oc06751		X
8	ASS2_2.6_26.8.21_TP044	Aug 26, 2021		Soil	L21-Oc06752		X
9	ASS1_0_26.8.21_TP050	Aug 26, 2021		Soil	L21-Oc06753		X
10	ASS2_2_26.8.21_TP050	Aug 26, 2021		Soil	L21-Oc06754		X
11	ASS1_0_26.8.21_TP043	Aug 26, 2021		Soil	L21-Oc06755		X
12	ASS2_3_26.8.21_TP043	Aug 26, 2021		Soil	L21-Oc06756		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
13	ASS1_0_27.8.21_TP036	Aug 27, 2021		Soil	L21-Oc06757		X
14	ASS1_0_27.8.21_TP037	Aug 27, 2021		Soil	L21-Oc06758		X
15	ASS2_3_27.8.21_TP037	Aug 27, 2021		Soil	L21-Oc06759		X
16	ASS1_0_27.8.21_TP046	Aug 27, 2021		Soil	L21-Oc06760		X
17	ASS2_1.3_27.8.21_TP046	Aug 27, 2021		Soil	L21-Oc06761		X
18	ASS1_0_27.8.21_TP047	Aug 27, 2021		Soil	L21-Oc06762		X
19	ASS2_2_27.8.	Aug 27, 2021		Soil	L21-Oc06763		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP047						
20	ASS4_0_27.8.21_TP036	Aug 27, 2021		Soil	L21-Oc06764		X
21	ASS1_0_29.8.21_TP080	Aug 29, 2021		Soil	L21-Oc06765		X
22	ASS2_2.2_29.8.21_TP080	Aug 29, 2021		Soil	L21-Oc06766		X
23	ASS1_0_29.8.21_TP081	Aug 29, 2021		Soil	L21-Oc06767		X
24	ASS2_2.3_29.8.21_TP081	Aug 29, 2021		Soil	L21-Oc06768		X
25	ASS1_0_29.8.21_TP085	Aug 29, 2021		Soil	L21-Oc06769		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
26	ASS4_2.6_29.8.21_TP085	Aug 29, 2021		Soil	L21-Oc06770		X
27	ASS1_0_29.8.21_TP086	Aug 29, 2021		Soil	L21-Oc06771		X
28	ASS2_1.6_29.8.21_TP086	Aug 29, 2021		Soil	L21-Oc06772		X
29	ASS1_0_29.8.21_TP087	Aug 29, 2021		Soil	L21-Oc06773		X
30	ASS4_1.6_29.8.21_TP087	Aug 29, 2021		Soil	L21-Oc06774		X
31	ASS1_0_29.8.21_TP090	Aug 29, 2021		Soil	L21-Oc06775		X
32	ASS2_2.2_29.	Aug 29, 2021		Soil	L21-Oc06776		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	8.21_TP090						
33	ASS1_0_29.8.21_TP092	Aug 29, 2021		Soil	L21-Oc06777		X
34	ASS2_2.2_29.8.21_TP092	Aug 29, 2021		Soil	L21-Oc06778		X
35	ASS1_0_29.8.21_TP095	Aug 29, 2021		Soil	L21-Oc06779		X
36	ASS2_1.9_29.8.21_TP095	Aug 29, 2021		Soil	L21-Oc06780		X
37	ASS1_0_29.8.21_TP096	Aug 29, 2021		Soil	L21-Oc06781		X
38	ASS2_2_29.8.21_TP096	Aug 29, 2021		Soil	L21-Oc06782		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
39	ASS2_0_29.8.21_TP085	Aug 29, 2021		Soil	L21-Oc06783		X
40	ASS2_0_29.8.21_TP087	Aug 29, 2021		Soil	L21-Oc06784		X
41	ASS1_0_31.8.21_TP082	Aug 31, 2021		Soil	L21-Oc06785		X
42	ASS4_2.4_31.8.21_TP082	Aug 31, 2021		Soil	L21-Oc06786		X
43	ASS1_0_31.8.21_TP083	Aug 31, 2021		Soil	L21-Oc06787		X
44	ASS2_1.5_31.8.21_TP083	Aug 31, 2021		Soil	L21-Oc06788		X
45	ASS1_0_31.8.	Aug 31, 2021		Soil	L21-Oc06789		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP145						
46	ASS2_1.7_31.8.21_TP145	Aug 31, 2021		Soil	L21-Oc06790		X
47	ASS1_0_31.8.21_TP186	Aug 31, 2021		Soil	L21-Oc06791		X
48	ASS2_2_31.8.21_TP186	Aug 31, 2021		Soil	L21-Oc06792		X
49	ASS1_0_31.8.21_TP187	Aug 31, 2021		Soil	L21-Oc06793		X
50	ASS2_2.1_31.8.21_TP187	Aug 31, 2021		Soil	L21-Oc06794		X
51	ASS1_0_31.8.21_TP188	Aug 31, 2021		Soil	L21-Oc06795		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
52	ASS2_2.4_31.8.21_TP188	Aug 31, 2021		Soil	L21-Oc06796		X
53	ASS1_0_31.8.21_TP189	Aug 31, 2021		Soil	L21-Oc06797		X
54	ASS4_1.5_31.8.21_TP189	Aug 31, 2021		Soil	L21-Oc06798		X
55	ASS1_0_31.8.21_TP190	Aug 31, 2021		Soil	L21-Oc06799		X
56	ASS2_2.3_31.8.21_TP190	Aug 31, 2021		Soil	L21-Oc06800		X
57	ASS2_0_31.8.21_TP082	Aug 31, 2021		Soil	L21-Oc06801		X
58	ASS2_0_29.8.	Aug 29, 2021		Soil	L21-Oc06802	X	

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Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP189						
59	ASS1_0_01.9.21_TP185	Sep 01, 2021		Soil	L21-Oc06803		X
60	ASS2_2.7_01.9.21_TP185	Sep 01, 2021		Soil	L21-Oc06804		X
61	ASS1_0_01.9.21_TP191	Sep 01, 2021		Soil	L21-Oc06805		X
62	ASS4_2.4_01.9.21_TP191	Sep 01, 2021		Soil	L21-Oc06806		X
63	ASS2_0_01.9.21_TP191	Sep 01, 2021		Soil	L21-Oc06807		X
64	ASS1_0_06.9.21_TP008	Sep 06, 2021		Soil	L21-Oc06808		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
65	ASS2_2.1_06.9.21_TP008	Sep 06, 2021		Soil	L21-Oc06809		X
66	ASS1_0_06.9.21_TP007	Sep 06, 2021		Soil	L21-Oc06810		X
67	ASS2_1.9_06.9.21_TP007	Sep 06, 2021		Soil	L21-Oc06811		X
68	ASS1_0_06.9.21_TP006	Sep 06, 2021		Soil	L21-Oc06812		X
69	ASS2_2.1_06.9.21_TP006	Sep 06, 2021		Soil	L21-Oc06813		X
70	ASS1_0_06.9.21_TP005	Sep 06, 2021		Soil	L21-Oc06814		X
71	ASS2_0.5_06.	Sep 06, 2021		Soil	L21-Oc06815		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	9.21_TP005						
72	ASS3_1_06.9.21_TP005	Sep 06, 2021		Soil	L21-Oc06816		X
73	ASS4_1.5_06.9.21_TP005	Sep 06, 2021		Soil	L21-Oc06817		X
74	ASS5_2_06.9.21_TP005	Sep 06, 2021		Soil	L21-Oc06818		X
75	ASS6_2.5_06.9.21_TP005	Sep 06, 2021		Soil	L21-Oc06819		X
76	ASS1_0_06.9.21_TP163	Sep 06, 2021		Soil	L21-Oc06820		X
77	ASS2_1.5_06.9.21_TP163	Sep 06, 2021		Soil	L21-Oc06821		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
78	ASS1_0_06.9.21_TP164	Sep 06, 2021		Soil	L21-Oc06822		X
79	ASS2_2.6_06.9.21_TP164	Sep 06, 2021		Soil	L21-Oc06823		X
80	ASS1_0_06.9.21_TP169	Sep 06, 2021		Soil	L21-Oc06824		X
81	ASS4_2_06.9.21_TP169	Sep 06, 2021		Soil	L21-Oc06825		X
82	ASS1_0_06.9.21_TP165	Sep 06, 2021		Soil	L21-Oc06826		X
83	ASS2_3_06.9.21_TP165	Sep 06, 2021		Soil	L21-Oc06827		X
84	ASS1_0_06.9.	Sep 06, 2021		Soil	L21-Oc06828		X

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Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP153						
85	ASS2_2_06.9.21_TP153	Sep 06, 2021		Soil	L21-Oc06829		X
86	ASS7_2.5_06.9.21_TP005	Sep 06, 2021		Soil	L21-Oc06830		X
87	ASS2_0_06.9.21_TP169	Sep 06, 2021		Soil	L21-Oc06831		X
88	ASS1_0_07.9.21_TP154	Sep 07, 2021		Soil	L21-Oc06832		X
89	ASS2_2_07.9.21_TP154	Sep 07, 2021		Soil	L21-Oc06833		X
90	ASS1_0_07.9.21_TP155	Sep 07, 2021		Soil	L21-Oc06834		X

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Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
91	ASS2_3_07.9.21_TP155	Sep 07, 2021		Soil	L21-Oc06835		X
92	ASS1_0_07.9.21_TP156	Sep 07, 2021		Soil	L21-Oc06836		X
93	ASS2_1.8_07.9.21_TP156	Sep 07, 2021		Soil	L21-Oc06837		X
94	ASS1_0_07.9.21_TP157	Sep 07, 2021		Soil	L21-Oc06838		X
95	ASS2_0.5_07.9.21_TP157	Sep 07, 2021		Soil	L21-Oc06839		X
96	ASS3_1_07.9.21_TP157	Sep 07, 2021		Soil	L21-Oc06840		X
97	ASS4_1.5_07.	Sep 07, 2021		Soil	L21-Oc06841		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	9.21_TP157						
98	ASS5_2_07.9.21_TP157	Sep 07, 2021		Soil	L21-Oc06842		X
99	ASS6_2.5_07.9.21_TP157	Sep 07, 2021		Soil	L21-Oc06843		X
100	ASS7_2.8_07.9.21_TP157	Sep 07, 2021		Soil	L21-Oc06844		X
101	ASS1_0_07.9.21_TP158	Sep 07, 2021		Soil	L21-Oc06845		X
102	ASS2_0.5_07.9.21_TP158	Sep 07, 2021		Soil	L21-Oc06846		X
103	ASS3_1_07.9.21_TP158	Sep 07, 2021		Soil	L21-Oc06847		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
104	ASS4_1.2_07.9.21_TP158	Sep 07, 2021		Soil	L21-Oc06848		X
105	ASS1_0_07.9.21_TP159	Sep 07, 2021		Soil	L21-Oc06849		X
106	ASS2_0.5_07.9.21_TP159	Sep 07, 2021		Soil	L21-Oc06850		X
107	ASS3_1_07.9.21_TP159	Sep 07, 2021		Soil	L21-Oc06851		X
108	ASS4_1.5_07.9.21_TP159	Sep 07, 2021		Soil	L21-Oc06852		X
109	ASS5_2_07.9.21_TP159	Sep 07, 2021		Soil	L21-Oc06853		X
110	ASS6_2.4_07.	Sep 07, 2021		Soil	L21-Oc06854		X

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Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	9.21_TP159						
111	ASS1_0_07.9.21_TP160	Sep 07, 2021		Soil	L21-Oc06855		X
112	ASS2_2.1_07.9.21_TP160	Sep 07, 2021		Soil	L21-Oc06856		X
113	ASS1_0_07.9.21_TP009	Sep 07, 2021		Soil	L21-Oc06857		X
114	ASS2_2.1_07.9.21_TP009	Sep 07, 2021		Soil	L21-Oc06858		X
115	ASS1_0_07.9.21_TP010	Sep 07, 2021		Soil	L21-Oc06859		X
116	ASS2_1.9_07.9.21_TP010	Sep 07, 2021		Soil	L21-Oc06860		X

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Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
117	ASS1_0_07.9.21_TP011	Sep 07, 2021		Soil	L21-Oc06861		X
118	ASS2_1.7_07.9.21_TP011	Sep 07, 2021		Soil	L21-Oc06862		X
119	ASS1_0_09.9.21_TP182	Sep 09, 2021		Soil	L21-Oc06863		X
120	ASS2_1.2_09.9.21_TP182	Sep 09, 2021		Soil	L21-Oc06864		X
121	ASS1_0_09.9.21_TP180	Sep 09, 2021		Soil	L21-Oc06865		X
122	ASS2_2.8_09.9.21_TP180	Sep 09, 2021		Soil	L21-Oc06866		X
123	ASS1_0_09.9.	Sep 09, 2021		Soil	L21-Oc06867		X

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Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP168						
124	ASS2_1.7_09.9.21_TP168	Sep 09, 2021		Soil	L21-Oc06868		X
125	ASS1_0_09.9.21_TP152	Sep 09, 2021		Soil	L21-Oc06869		X
126	ASS2_2.1_09.9.21_TP152	Sep 09, 2021		Soil	L21-Oc06870		X
127	ASS1`_0_09.9.21_TP162	Sep 09, 2021		Soil	L21-Oc06871		X
128	ASS2_1.4_09.9.21_TP162	Sep 09, 2021		Soil	L21-Oc06872		X
129	ASS1_0_09.9.21_TP151	Sep 09, 2021		Soil	L21-Oc06873		X

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Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
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Priority: 10 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
130	ASS2_1.4_09.9.21_TP151	Sep 09, 2021		Soil	L21-Oc06874		X
131	ASS1_0_10.9.21_TP167	Sep 10, 2021		Soil	L21-Oc06875		X
132	ASS2_2.1_10.9.21_TP167	Sep 10, 2021		Soil	L21-Oc06876		X
133	ASS1_0_10.9.21_TP181	Sep 10, 2021		Soil	L21-Oc06877		X
134	ASS4_2.3_10.9.21_TP181	Sep 10, 2021		Soil	L21-Oc06878		X
135	ASS1_0_10.9.21_TP183	Sep 10, 2021		Soil	L21-Oc06879		X
136	ASS2_1.8_10.	Sep 10, 2021		Soil	L21-Oc06880		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	9.21_TP183						
137	ASS1_0_10.9.21_TP184	Sep 10, 2021		Soil	L21-Oc06881		X
138	ASS2_1.5_10.9.21_TP184	Sep 10, 2021		Soil	L21-Oc06882		X
139	ASS1`_0_10.9.21_TP147	Sep 10, 2021		Soil	L21-Oc06883		X
140	ASS2_1.3_10.9.21_TP147	Sep 10, 2021		Soil	L21-Oc06884		X
141	ASS1_0_10.9.21_TP148	Sep 10, 2021		Soil	L21-Oc06885		X
142	ASS2_1.7_10.9.21_TP148	Sep 10, 2021		Soil	L21-Oc06886		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
143	ASS1_0_10.9.21_TP149	Sep 10, 2021		Soil	L21-Oc06887		X
144	ASS2_2.1_10.9.21_TP149	Sep 10, 2021		Soil	L21-Oc06888		X
145	ASS1_0_10.9.21_TP150	Sep 10, 2021		Soil	L21-Oc06889		X
146	ASS2_1.3_10.9.21_TP150	Sep 10, 2021		Soil	L21-Oc06890		X
147	ASS1_0_10.9.21_TP135	Sep 10, 2021		Soil	L21-Oc06891		X
148	ASS2_0.9_10.9.21_TP135	Sep 10, 2021		Soil	L21-Oc06892		X
149	ASS1_0_10.9.	Sep 10, 2021		Soil	L21-Oc06893		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP134						
150	ASS2_1.8_10.9.21_TP134	Sep 10, 2021		Soil	L21-Oc06894		X
151	ASS1_0_10.9.21_TP133	Sep 10, 2021		Soil	L21-Oc06895		X
152	ASS2_2.2_10.9.21_TP133	Sep 10, 2021		Soil	L21-Oc06896		X
153	ASS2_0_10.9.21_TP181	Sep 10, 2021		Soil	L21-Oc06897		X
154	ASS1_0_11.9.21_TP132	Sep 11, 2021		Soil	L21-Oc06898		X
155	ASS2_1.6_11.9.21_TP132	Sep 11, 2021		Soil	L21-Oc06899		X

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Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
156	ASS1_0_11.9.21_TP131	Sep 11, 2021		Soil	L21-Oc06900		X
157	ASS2_1_11.9.21_TP131	Sep 11, 2021		Soil	L21-Oc06901		X
158	ASS1_0_11.9.21_TP130	Sep 11, 2021		Soil	L21-Oc06902		X
159	ASS2_0.5_11.9.21_TP130	Sep 11, 2021		Soil	L21-Oc06903		X
160	ASS3_1_11.9.21_TP130	Sep 11, 2021		Soil	L21-Oc06904		X
161	ASS4_1.5_11.9.21_TP130	Sep 11, 2021		Soil	L21-Oc06905		X
162	ASS5_2_11.9.	Sep 11, 2021		Soil	L21-Oc06906		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP130						
163	ASS1_0_11.9.21_TP012	Sep 11, 2021		Soil	L21-Oc06907		X
164	ASS2_3_11.9.21_TP012	Sep 11, 2021		Soil	L21-Oc06908		X
165	ASS1_0_11.9.21_TP013	Sep 11, 2021		Soil	L21-Oc06909		X
166	ASS2_0.7_11.9.21_TP013	Sep 11, 2021		Soil	L21-Oc06910		X
167	ASS1_0_11.9.21_TP014	Sep 11, 2021		Soil	L21-Oc06911		X
168	ASS2_0.9_11.9.21_TP014	Sep 11, 2021		Soil	L21-Oc06912		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
169	ASS1_0_11.9.21_TP015	Sep 11, 2021		Soil	L21-Oc06913		X
170	ASS2_0.5_11.9.21_TP015	Sep 11, 2021		Soil	L21-Oc06914		X
171	ASS3_1_11.9.21_TP015	Sep 11, 2021		Soil	L21-Oc06915		X
172	ASS4_1.5_11.9.21_TP015	Sep 11, 2021		Soil	L21-Oc06916		X
173	ASS1_0_11.9.21_TP016	Sep 11, 2021		Soil	L21-Oc06917		X
174	ASS2_0.5_11.9.21_TP016	Sep 11, 2021		Soil	L21-Oc06918		X
175	ASS3_1.1_11.	Sep 11, 2021		Soil	L21-Oc06919		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	9.21_TP016						
176	ASS4_2.6_11.9.21_TP016	Sep 11, 2021		Soil	L21-Oc06920		X
177	ASS1_0_11.9.21_TP017	Sep 11, 2021		Soil	L21-Oc06921		X
178	ASS2_0.8_11.9.21_TP017	Sep 11, 2021		Soil	L21-Oc06922		X
179	ASS1_0_11.9.21_TP018	Sep 11, 2021		Soil	L21-Oc06923		X
180	ASS2_3_11.9.21_TP018	Sep 11, 2021		Soil	L21-Oc06924		X
181	ASS1_0_12.9.21_TP019	Sep 12, 2021		Soil	L21-Oc06925		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
182	ASS2_2.4_12.9.21_TP019	Sep 12, 2021		Soil	L21-Oc06926		X
183	ASS1_0_12.9.21_TP020	Sep 12, 2021		Soil	L21-Oc06927		X
184	ASS2_3.1_12.9.21_TP020	Sep 12, 2021		Soil	L21-Oc06928		X
185	ASS1_0_12.9.21_TP021	Sep 12, 2021		Soil	L21-Oc06929		X
186	ASS2_3_12.9.21_TP021	Sep 12, 2021		Soil	L21-Oc06930		X
187	ASS1_0_12.9.21_TP022	Sep 12, 2021		Soil	L21-Oc06931		X
188	ASS2_3_12.9.	Sep 12, 2021		Soil	L21-Oc06932		X

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Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP022						
189	ASS1_0_12.9.21_TP024	Sep 12, 2021		Soil	L21-Oc06933		X
190	ASS2_1.7_12.9.21_TP024	Sep 12, 2021		Soil	L21-Oc06934		X
191	ASS1_0_12.9.21_TP025	Sep 12, 2021		Soil	L21-Oc06935		X
192	ASS2_3_12.9.21_TP025	Sep 12, 2021		Soil	L21-Oc06936		X
193	ASS1_0_12.9.21_TP026	Sep 12, 2021		Soil	L21-Oc06937		X
194	ASS2_3_12.9.21_TP026	Sep 12, 2021		Soil	L21-Oc06938		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
195	ASS1_0_12.9.21_TP027	Sep 12, 2021		Soil	L21-Oc06939		X
196	ASS2_2.8_12.9.21_TP027	Sep 12, 2021		Soil	L21-Oc06940		X
197	ASS1_0_12.9.21_TP028	Sep 12, 2021		Soil	L21-Oc06941		X
198	ASS2_2.1_12.9.21_TP028	Sep 12, 2021		Soil	L21-Oc06942		X
199	ASS1_0_12.9.21_TP029	Sep 12, 2021		Soil	L21-Oc06943		X
200	ASS2_1.6_12.9.21_TP029	Sep 12, 2021		Soil	L21-Oc06944		X
201	ASS1_0_13.9.	Sep 13, 2021		Soil	L21-Oc06945		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP030						
202	ASS2_1.8_13.9.21_TP030	Sep 13, 2021		Soil	L21-Oc06946		X
203	ASS1_0_13.9.21_TP031	Sep 13, 2021		Soil	L21-Oc06947		X
204	ASS2_1.4_13.9.21_TP031	Sep 13, 2021		Soil	L21-Oc06948		X
205	ASS1_0_13.9.21_TP032	Sep 13, 2021		Soil	L21-Oc06949		X
206	ASS2_0.9_13.9.21_TP032	Sep 13, 2021		Soil	L21-Oc06950		X
207	ASS1_0_13.9.21_TP033	Sep 13, 2021		Soil	L21-Oc06951		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
208	ASS2_0.8_13.9.21_TP033	Sep 13, 2021		Soil	L21-Oc06952		X
209	ASS1_0_17.9.21_TP274	Sep 17, 2021		Soil	L21-Oc06953		X
210	ASS2_2.3_17.9.21_TP274	Sep 17, 2021		Soil	L21-Oc06954		X
211	ASS1_0_17.9.21_TP275	Sep 17, 2021		Soil	L21-Oc06955		X
212	ASS2_1_17.9.21_TP275	Sep 17, 2021		Soil	L21-Oc06956		X
213	ASS1_0_17.9.21_TP276	Sep 17, 2021		Soil	L21-Oc06957		X
214	ASS2_1.5_17.	Sep 17, 2021		Soil	L21-Oc06958		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	9.21_TP276						
215	ASS1_0_17.9.21_TP278	Sep 17, 2021		Soil	L21-Oc06959		X
216	ASS2_2_17.9.21_TP278	Sep 17, 2021		Soil	L21-Oc06960		X
217	ASS1_0_18.9.21_TP136	Sep 18, 2021		Soil	L21-Oc06961		X
218	ASS2_2_18.9.21_TP136	Sep 18, 2021		Soil	L21-Oc06962		X
219	ASS1_0_18.9.21_TP137	Sep 18, 2021		Soil	L21-Oc06963		X
220	ASS2_2.2_18.9.21_TP137	Sep 18, 2021		Soil	L21-Oc06964		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
221	ASS1_0_19.9.21_TP004	Sep 19, 2021		Soil	L21-Oc06965		X
222	ASS2_2.6_19.9.21_TP004	Sep 19, 2021		Soil	L21-Oc06966		X
223	ASS1_0_19.9.21_TP170	Sep 19, 2021		Soil	L21-Oc06967		X
224	ASS2_2.2_19.9.21_TP170	Sep 19, 2021		Soil	L21-Oc06968		X
225	ASS1_0_19.9.21_TP171	Sep 19, 2021		Soil	L21-Oc06969		X
226	ASS2_1.4_19.9.21_TP171	Sep 19, 2021		Soil	L21-Oc06970		X
227	ASS1_0_19.9.	Sep 19, 2021		Soil	L21-Oc06971		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP172						
228	ASS2_2.5_19.9.21_TP172	Sep 19, 2021		Soil	L21-Oc06972		X
229	ASS1_0_19.9.21_TP173	Sep 19, 2021		Soil	L21-Oc06973		X
230	ASS2_2.4_19.9.21_TP173	Sep 19, 2021		Soil	L21-Oc06974		X
231	ASS1_0_19.9.21_TP174	Sep 19, 2021		Soil	L21-Oc06975		X
232	ASS2_1.6_19.9.21_TP174	Sep 19, 2021		Soil	L21-Oc06976		X
233	ASS1_0_19.9.21_TP175	Sep 19, 2021		Soil	L21-Oc06977		X

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
234	ASS2_2.1_19.9.21_TP175	Sep 19, 2021		Soil	L21-Oc06978		X
235	ASS1_0_19.9.21_TP176	Sep 19, 2021		Soil	L21-Oc06979		X
236	ASS2_1.4_19.9.21_TP176	Sep 19, 2021		Soil	L21-Oc06980		X
237	ASS1_0_19.9.21_TP177	Sep 19, 2021		Soil	L21-Oc06981		X
238	ASS2_2.3_19.9.21_TP177	Sep 19, 2021		Soil	L21-Oc06982		X
239	ASS1_0_20.9.21_TP002	Sep 20, 2021		Soil	L21-Oc06983		X
240	ASS2_1.4_20.	Sep 20, 2021		Soil	L21-Oc06984		X

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Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	9.21_TP002						
241	ASS1_0_20.9.21_TP003	Sep 20, 2021		Soil	L21-Oc06985		X
242	ASS2_1.9_20.9.21_TP003	Sep 20, 2021		Soil	L21-Oc06986		X
243	ASS1_0_20.9.21_TP178	Sep 20, 2021		Soil	L21-Oc06987		X
244	ASS2_1.5_20.9.21_TP178	Sep 20, 2021		Soil	L21-Oc06988		X
245	ASS1_0_20.9.21_TP179	Sep 20, 2021		Soil	L21-Oc06989		X
246	ASS2_1.4_20.9.21_TP179	Sep 20, 2021		Soil	L21-Oc06990		X

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Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
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WA 6000

Project Name:
Project ID: W-AO

Order No.: W-AO
Report #: 829534
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
Due: Oct 13, 2021
Priority: 10 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
247	ASS1_0_20.9.21_TP197	Sep 20, 2021		Soil	L21-Oc06991		X
248	ASS2_1.7_20.9.21_TP197	Sep 20, 2021		Soil	L21-Oc06992		X
249	ASS1_0_20.9.21_TP198	Sep 20, 2021		Soil	L21-Oc06993		X
250	ASS2_1.5_20.9.21_TP198	Sep 20, 2021		Soil	L21-Oc06994		X
251	ASS4_3_27.8.21_TP036	Aug 27, 2021		Soil	L21-Oc07012		X
Test Counts						1	250

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06745	CP	pH Units	9.6	9.9	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06745	CP	pH Units	10	10	pass	30%	Pass	
Reaction Ratings*	L21-Oc06745	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06755	CP	pH Units	9.4	9.5	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06755	CP	pH Units	9.5	9.6	pass	30%	Pass	
Reaction Ratings*	L21-Oc06755	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06765	CP	pH Units	9.1	9.0	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06765	CP	pH Units	9.0	9.0	pass	30%	Pass	
Reaction Ratings*	L21-Oc06765	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06775	CP	pH Units	9.2	9.3	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06775	CP	pH Units	9.1	9.1	pass	30%	Pass	
Reaction Ratings*	L21-Oc06775	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06785	CP	pH Units	9.3	9.3	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06785	CP	pH Units	9.2	9.5	pass	30%	Pass	
Reaction Ratings*	L21-Oc06785	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06795	CP	pH Units	9.6	9.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06795	CP	pH Units	9.6	9.8	pass	30%	Pass	
Reaction Ratings*	L21-Oc06795	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06805	CP	pH Units	9.0	9.0	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06805	CP	pH Units	9.0	9.3	pass	30%	Pass	
Reaction Ratings*	L21-Oc06805	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06815	CP	pH Units	8.9	8.6	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06815	CP	pH Units	8.7	8.6	pass	30%	Pass	
Reaction Ratings*	L21-Oc06815	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06825	CP	pH Units	8.5	8.6	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06825	CP	pH Units	8.7	8.8	pass	30%	Pass	
Reaction Ratings*	L21-Oc06825	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06835	CP	pH Units	9.4	9.3	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06835	CP	pH Units	9.1	9.0	pass	30%	Pass	
Reaction Ratings*	L21-Oc06835	CP	-	4.0	4.0	pass	30%	Pass	

Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06845	CP	pH Units	8.0	7.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06845	CP	pH Units	8.5	8.7	pass	30%	Pass	
Reaction Ratings*	L21-Oc06845	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06855	CP	pH Units	9.3	9.3	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06855	CP	pH Units	9.2	9.4	pass	30%	Pass	
Reaction Ratings*	L21-Oc06855	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06865	CP	pH Units	9.4	9.5	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06865	CP	pH Units	9.4	9.7	pass	30%	Pass	
Reaction Ratings*	L21-Oc06865	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06875	CP	pH Units	9.1	9.2	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06875	CP	pH Units	9.3	9.3	pass	30%	Pass	
Reaction Ratings*	L21-Oc06875	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06885	CP	pH Units	9.1	9.1	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06885	CP	pH Units	9.2	9.4	pass	30%	Pass	
Reaction Ratings*	L21-Oc06885	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06895	CP	pH Units	9.4	9.4	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06895	CP	pH Units	9.4	9.4	pass	30%	Pass	
Reaction Ratings*	L21-Oc06895	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06905	CP	pH Units	8.8	9.1	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06905	CP	pH Units	9.1	9.2	pass	30%	Pass	
Reaction Ratings*	L21-Oc06905	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06915	CP	pH Units	9.6	9.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06915	CP	pH Units	9.5	9.6	pass	30%	Pass	
Reaction Ratings*	L21-Oc06915	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06925	CP	pH Units	8.6	8.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06925	CP	pH Units	9.2	9.2	pass	30%	Pass	
Reaction Ratings*	L21-Oc06925	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06935	CP	pH Units	9.7	9.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06935	CP	pH Units	9.5	9.4	pass	30%	Pass	
Reaction Ratings*	L21-Oc06935	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06945	CP	pH Units	8.4	8.6	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06945	CP	pH Units	7.4	7.4	pass	30%	Pass	
Reaction Ratings*	L21-Oc06945	CP	-	4.0	4.0	pass	30%	Pass	

Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06955	CP	pH Units	9.5	9.5	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06955	CP	pH Units	8.5	8.6	pass	30%	Pass	
Reaction Ratings*	L21-Oc06955	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06965	CP	pH Units	8.7	8.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06965	CP	pH Units	8.7	8.7	pass	30%	Pass	
Reaction Ratings*	L21-Oc06965	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06975	CP	pH Units	8.8	8.8	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06975	CP	pH Units	8.7	8.9	pass	30%	Pass	
Reaction Ratings*	L21-Oc06975	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc06985	CP	pH Units	8.8	9.0	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc06985	CP	pH Units	8.9	9.0	pass	30%	Pass	
Reaction Ratings*	L21-Oc06985	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc07012	CP	pH Units	9.7	9.4	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc07012	CP	pH Units	10.0	9.7	pass	30%	Pass	
Reaction Ratings*	L21-Oc07012	CP	-	4.0	4.0	pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Rhys Thomas Analytical Services Manager



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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IANZ # 1327

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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Karen Mackenzie
Project name:	Not provided
Project ID:	W-AO
Turnaround time:	5 Day
Date/Time received	Sep 29, 2021 2:08 PM
Eurofins reference	829534

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Rhys Thomas on phone : (+61) 8 9251 9602 or by email: RhysThomas@eurofins.com

Results will be delivered electronically via email to Karen Mackenzie - kmackenzie@lwconsulting.com.au.

Global Leader - Results you can trust

Robert Johnston

From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Wednesday, 29 September 2021 11:17
To: Robert Johnston; Matthew Deaves
Cc: Riley Martin
Subject: LWC job no W-AO samples COC for dispatch of 21 September
Attachments: Test Pit ASS COC_DISPATCH_21SEPT21.xlsx; CHem Centre COC_29092021.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

EXTERNAL EMAIL*

Caitlyn Gibson A
Eurofins # 829534
829537

Hi All,

Please find attached the COC for the samples you received last week.

There are 9 samples to go to Chem Centre.

I'm working through the others now, will get back to you as soon as I can.

Cheers,

Karen

Dr Karen Mackenzie | Principal Geochemist

Land & Water Consulting
Core Innovation Hub, Level Seven,
191 St Georges Terrace, Perth, WA 6000
M: +61 448 682 774
kmackenzie@lwconsulting.com.au | www.lwconsulting.com.au

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CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP038	ASS1	26.8.21	0.00	Soil	1	1					
TP038	ASS2	26.8.21	1.80	Soil	1	1					
TP039	ASS1	26.8.21	0.00	Soil	1	1					
TP039	ASS2	26.8.21	2.10	Soil	1	1					
TP040	ASS1	26.8.21	0.00	Soil	1	1					
TP040	ASS2	26.8.21	2.10	Soil	1	1					
TP044	ASS1	26.8.21	0.00	Soil	1	1					
TP044	ASS2	26.8.21	2.60	Soil	1	1					
TP050	ASS1	26.8.21	0.00	Soil	1	1					
TP050	ASS2	26.8.21	2.00	Soil	1	1					
TP043	ASS1	26.8.21	0.00	Soil	1	1					
TP043	ASS2	26.8.21	3.00	Soil	1	1					
			TOTAL	**0**	**12**	**12**					

ADDITIONAL COMMENTS:

829534
829537

Date/Time: 29/9/21 2:08

Chilled: Yes / No

Temp: 15.4 16.0 16.6 15.3 12.5
16.3 11.9 14.2 12.8
12.4 12.6 14.9 14.5

Correction: -0.3

Final Temp:

14 °C

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP036	ASS1	27.8.21	0.00	Soil	1	1					
TP036	ASS4	27.8.21	3.00	Soil	1	1					
TP037	ASS1	27.8.21	0.00	Soil	1	1					
TP037	ASS2	27.8.21	3.00	Soil	1	1					
TP046	ASS1	27.8.21	0.00	Soil	1	1					
TP046	ASS2	27.8.21	1.30	Soil	1	1					
TP047	ASS3	27.8.21	0.00	Soil	1	1					
TP047	ASS4	27.8.21	2.00	Soil	1	1					
TP036	ASS2	27.8.21	0.00	Soil	1	1					
			TOTAL	0	9	9					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

LWC Project No:
W-AO
Project Manager:
Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP080	ASS1	29.8.21	0.00	Soil	1	1					
TP080	ASS2	29.8.21	2.20	Soil	1	1					
TP081	ASS1	29.8.21	0.00	Soil	1	1					
TP081	ASS2	29.8.21	2.30	Soil	1	1					
TP085	ASS1	29.8.21	0.00	Soil	1	1					
TP085	ASS4	29.8.21	2.60	Soil	1	1					
TP086	ASS1	29.8.21	0.00	Soil	1	1					
TP086	ASS2	29.8.21	1.60	Soil	1	1					
TP087	ASS1	29.8.21	0.00	Soil	1	1					
TP087	ASS4	29.8.21	1.60	Soil	1	1					
TP090	ASS1	29.8.21	0.00	Soil	1	1					
TP090	ASS2	29.8.21	2.20	Soil	1	1					
TP092	ASS1	29.8.21	0.00	Soil	1	1					
TP092	ASS2	29.8.21	2.20	Soil	1	1					
TP095	ASS1	29.8.21	0	Soil	1	1					
TP095	ASS2	29.8.21	1.9	Soil	1	1					
TP096	ASS1	29.8.21	0	Soil	1	1					
TP096	ASS2	29.8.21	2	Soil	1	1					
TP085	ASS2	29.8.21	0.00	Soil	1	1					
TP087	ASS2	29.8.21	0.00	Soil	1	1					
			TOTAL	0	20	20					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP082	ASS1	31.8.21	0.00	Soil	1	1					
TP082	ASS4	31.8.21	2.40	Soil	1	1					
TP083	ASS1	31.8.21	0.00	Soil	1	1					
TP083	ASS2	31.8.21	1.50	Soil	1	1					
TP145	ASS1	31.8.21	0.00	Soil	1	1					
TP145	ASS2	31.8.21	1.70	Soil	1	1					
TP186	ASS1	31.8.21	0.00	Soil	1	1					
TP186	ASS2	31.8.21	2.00	Soil	1	1					
TP187	ASS1	31.8.21	0.00	Soil	1	1					
TP187	ASS4	31.8.21	2.10	Soil	1	1					
TP188	ASS1	31.8.21	0.00	Soil	1	1					
TP188	ASS2	31.8.21	2.40	Soil	1	1					
TP189	ASS1	31.8.21	0.00	Soil	1	1					
TP189	ASS4	31.8.21	1.50	Soil	1	1					
TP190	ASS1	31.8.21	0	Soil	1	1					
TP190	ASS2	31.8.21	2.3	Soil	1	1					
TP082	ASS2	29/08/2021	0.00	Soil	1	1					
TP189	ASS2	29/08/2021	0.00	Soil	1	1					
			TOTAL	0	18	18					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

LWC Project No:
W-AO
Project Manager:
Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP185	ASS1	01.9.21	0.00	Soil	1	1					
TP185	ASS2	01.9.21	2.70	Soil	1	1					
TP191	ASS1	01.9.21	0.00	Soil	1	1					
TP191	ASS4	01.9.21	2.40	Soil	1	1					
TP191	ASS2	01.9.21	0.00	Soil	1	1					

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP008	ASS1	06.9.21	0.00	Soil	1	1					
TP008	ASS2	06.9.21	2.10	Soil	1	1					
TP007	ASS1	06.9.21	0.00	Soil	1	1					
TP007	ASS2	06.9.21	1.90	Soil	1	1					
TP006	ASS1	06.9.21	0.00	Soil	1	1					
TP006	ASS2	06.9.21	2.10	Soil	1	1					
TP005	ASS1	06.9.21	0.00	Soil	1	1					
TP005	ASS2	06.9.21	0.50	Soil	1	1					
TP005	ASS3	06.9.21	1.00	Soil	1	1					
TP005	ASS4	06.9.21	1.50	Soil	1	1					
TP005	ASS5	06.9.21	2.00	Soil	1	1					
TP005	ASS6	06.9.21	2.50	Soil	1	1					
TP163	ASS1	06.9.21	0.00	Soil	1	1					
TP163	ASS2	06.9.21	1.50	Soil	1	1					
TP164	ASS1	06.9.21	0.00	Soil	1	1					
TP164	ASS2	06.9.21	2.60	Soil	1	1					
TP169	ASS1	06.9.21	0.00	Soil	1	1					
TP169	ASS4	06.9.21	2.00	Soil	1	1					
TP165	ASS1	06.9.21	0.00	Soil	1	1					
TP165	ASS2	06.9.21	3.00	Soil	1	1					
TP153	ASS1	06.9.21	0.00	Soil	1	1					
TP153	ASS2	06.9.21	2.00	Soil	1	1					
TP005	ASS7	6/09/2021	2.50	Soil	1	1					
TP169	ASS2	6/09/2021	0.00	Soil	1	1					
			TOTAL	0	24	24					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP154	ASS1	07.9.21	0.00	Soil	1	1					
TP154	ASS2	07.9.21	2.00	Soil	1	1					
TP155	ASS1	07.9.21	0.00	Soil	1	1					
TP155	ASS2	07.9.21	3.00	Soil	1	1					
TP156	ASS1	07.9.21	0.00	Soil	1	1					
TP156	ASS2	07.9.21	1.80	Soil	1	1					
TP157	ASS1	07.9.21	0.00	Soil	1	1					
TP157	ASS2	07.9.21	0.50	Soil	1	1					
TP157	ASS3	07.9.21	1.00	Soil	1	1					
TP157	ASS4	07.9.21	1.50	Soil	1	1					
TP157	ASS5	07.9.21	2.00	Soil	1	1					
TP157	ASS6	07.9.21	2.50	Soil	1	1					
TP157	ASS7	07.9.21	2.80	Soil	1	1					
TP158	ASS1	07.9.21	0.00	Soil	1	1					
TP158	ASS2	07.9.21	0.50	Soil	1	1					
TP158	ASS3	07.9.21	1.00	Soil	1	1					
TP158	ASS4	07.9.21	1.20	Soil	1	1					
TP159	ASS1	07.9.21	0.00	Soil	1	1					
TP159	ASS2	07.9.21	0.50	Soil	1	1					
TP159	ASS3	07.9.21	1.00	Soil	1	1					
TP159	ASS4	07.9.21	1.50	Soil	1	1					
TP159	ASS5	07.9.21	2.00	Soil	1	1					
TP159	ASS6	07.9.21	2.40	Soil	1	1					
TP160	ASS1	07.9.21	0.00	Soil	1	1					
TP160	ASS2	07.9.21	2.10	Soil	1	1					
TP009	ASS1	07.9.21	0.00	Soil	1	1					
TP009	ASS2	07.9.21	2.10	Soil	1	1					
TP010	ASS1	07.9.21	0.00	Soil	1	1					
TP010	ASS2	07.9.21	1.90	Soil	1	1					
TP011	ASS1	07.9.21	0.00	Soil	1	1					
TP011	ASS2	07.9.21	1.70	Soil	1	1					
			TOTAL	0	31	31					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

LWC Project No:
W-AO
Project Manager:
Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP182	ASS1	09.9.21	0.00	Soil	1	1					
TP182	ASS2	09.9.21	1.20	Soil	1	1					
TP180	ASS1	09.9.21	0.00	Soil	1	1					
TP180	ASS2	09.9.21	2.80	Soil	1	1					
TP168	ASS1	09.9.21	0.00	Soil	1	1					
TP168	ASS2	09.9.21	1.70	Soil	1	1					
TP152	ASS1	09.9.21	0.00	Soil	1	1					
TP152	ASS2	09.9.21	2.10	Soil	1	1					
TP162	ASS1`	09.9.21	0.00	Soil	1	1					
TP162	ASS2	09.9.21	1.40	Soil	1	1					
TP151	ASS1	09.9.21	0.00	Soil	1	1					
TP151	ASS2	09.9.21	1.40	Soil	1	1					
			TOTAL	0	12	12					

ADDITIONAL COMMENTS:

Check integrity of bags

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP167	ASS1	10.9.21	0.00	Soil	1	1					
TP167	ASS2	10.9.21	2.10	Soil	1	1					
TP181	ASS1	10.9.21	0.00	Soil	1	1					
TP181	ASS4	10.9.21	2.30	Soil	1	1					
TP183	ASS1	10.9.21	0.00	Soil	1	1					
TP183	ASS2	10.9.21	1.80	Soil	1	1					
TP184	ASS1	10.9.21	0.00	Soil	1	1					
TP184	ASS2	10.9.21	1.50	Soil	1	1					
TP147	ASS1`	10.9.21	0.00	Soil	1	1					
TP147	ASS2	10.9.21	1.30	Soil	1	1					
TP148	ASS1	10.9.21	0.00	Soil	1	1					
TP148	ASS2	10.9.21	1.70	Soil	1	1					
TP149	ASS1	10.9.21	0.00	Soil	1	1					
TP149	ASS2	10.9.21	2.10	Soil	1	1					
TP150	ASS1	10.9.21	0.00	Soil	1	1					
TP150	ASS2	10.9.21	1.30	Soil	1	1					
TP135	ASS1	10.9.21	0.00	Soil	1	1					
TP135	ASS2	10.9.21	0.90	Soil	1	1					
TP134	ASS1	10.9.21	0.00	Soil	1	1					
TP134	ASS2	10.9.21	1.80	Soil	1	1					
TP133	ASS1	10.9.21	0.00	Soil	1	1					
TP133	ASS2	10.9.21	2.20	Soil	1	1					
TP181	ASS2	10.9.21	0.00	Soil	1	1					
			TOTAL	0	23	23					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP132	ASS1	11.9.21	0.00	Soil	1	1					
TP132	ASS2	11.9.21	1.60	Soil	1	1					
TP131	ASS1	11.9.21	0.00	Soil	1	1					
TP131	ASS2	11.9.21	1.00	Soil	1	1					
TP130	ASS1	11.9.21	0.00	Soil	1	1					
TP130	ASS2	11.9.21	0.50	Soil	1	1					
TP130	ASS3	11.9.21	1.00	Soil	1	1					
TP130	ASS4	11.9.21	1.50	Soil	1	1					
TP130	ASS5	11.9.21	2.00	Soil	1	1					
TP012	ASS1	11.9.21	0.00	Soil	1	1					
TP012	ASS2	11.9.21	3.00	Soil	1	1					
TP013	ASS1	11.9.21	0.00	Soil	1	1					
TP013	ASS2	11.9.21	0.70	Soil	1	1					
TP014	ASS1	11.9.21	0.00	Soil	1	1					
TP014	ASS2	11.9.21	0.90	Soil	1	1					
TP015	ASS1	11.9.21	0.00	Soil	1	1					
TP015	ASS2	11.9.21	0.50	Soil	1	1					
TP015	ASS3	11.9.21	1.00	Soil	1	1					
TP015	ASS4	11.9.21	1.50	Soil	1	1					
TP016	ASS1	11.9.21	0.00	Soil	1	1					
TP016	ASS2	11.9.21	0.50	Soil	1	1					
TP016	ASS3	11.9.21	1.10	Soil	1	1					
TP016	ASS4	11.9.21	2.60	Soil	1	1					
TP017	ASS1	11.9.21	0.00	Soil	1	1					
TP017	ASS2	11.9.21	0.80	Soil	1	1					
TP018	ASS1	11.9.21	0.00	Soil	1	1					
TP018	ASS2	11.9.21	3.00	Soil	1	1					
			TOTAL	**0**	**27**	**27**					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	phF	pHfox					
TP019	ASS1	12.9.21	0.00	Soil	1	1					
TP019	ASS2	12.9.21	2.40	Soil	1	1					
TP020	ASS1	12.9.21	0.00	Soil	1	1					
TP020	ASS2	12.9.21	3.10	Soil	1	1					
TP021	ASS1	12.9.21	0.00	Soil	1	1					
TP021	ASS2	12.9.21	3.00	Soil	1	1					
TP022	ASS1	12.9.21	0.00	Soil	1	1					
TP022	ASS2	12.9.21	3.00	Soil	1	1					
TP023	ASS1`	12.9.21		Soil	1	1					
TP023	ASS2	12.9.21		Soil	1	1					
				Soil	1	1					
				Soil	1	1					
TP024	ASS1	12.9.21	0.00	Soil	1	1					
TP024	ASS2	12.9.21	1.70	Soil	1	1					
TP025	ASS1	12.9.21	0.00	Soil	1	1					
TP025	ASS2	12.9.21	3.00	Soil	1	1					
TP026	ASS1	12.9.21	0.00	Soil	1	1					
TP026	ASS2	12.9.21	3.00	Soil	1	1					
TP027	ASS1	12.9.21	0.00	Soil	1	1					
TP027	ASS2	12.9.21	2.80	Soil	1	1					
TP028	ASS1	12.9.21	0.00	Soil	1	1					
TP028	ASS2	12.9.21	2.10	Soil	1	1					
TP029	ASS1	12.9.21	0.00	Soil	1	1					
TP029	ASS2	12.9.21	1.60	Soil	1	1					
			TOTAL	0	24	24					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP030	ASS1	13.9.21	0.00	Soil	1	1					
TP030	ASS2	13.9.21	1.80	Soil	1	1					
TP031	ASS1	13.9.21	0.00	Soil	1	1					
TP031	ASS2	13.9.21	1.40	Soil	1	1					
TP032	ASS1	13.9.21	0.00	Soil	1	1					
TP032	ASS2	13.9.21	0.90	Soil	1	1					
TP033	ASS1	13.9.21	0.00	Soil	1	1					
TP033	ASS2	13.9.21	0.80	Soil	1	1					
			TOTAL	0	8	8					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP274	ASS1	17.9.21	0.00	Soil	1	1					
TP274	ASS2	17.9.21	2.30	Soil	1	1					
TP275	ASS1	17.9.21	0.00	Soil	1	1					
TP275	ASS2	17.9.21	1.00	Soil	1	1					
TP276	ASS1	17.9.21	0.00	Soil	1	1					
TP276	ASS2	17.9.21	1.50	Soil	1	1					
TP278	ASS1	17.9.21	0.00	Soil	1	1					
TP278	ASS2	17.9.21	2.00	Soil	1	1					
			TOTAL	0	8	8					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP136	ASS1	18.9.21	0.00	Soil	1	1					
TP136	ASS2	18.9.21	2.00	Soil	1	1					
TP137	ASS1	18.9.21	0.00	Soil	1	1					
TP137	ASS2	18.9.21	2.20	Soil	1	1					
			TOTAL	0	4	4					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP004	ASS1	19.9.21	0.00	Soil	1	1					
TP004	ASS2	19.9.21	2.60	Soil	1	1					
TP170	ASS1	19.9.21	0.00	Soil	1	1					
TP170	ASS2	19.9.21	2.20	Soil	1	1					
TP171	ASS1	19.9.21	0.00	Soil	1	1					
TP171	ASS2	19.9.21	1.40	Soil	1	1					
TP172	ASS1	19.9.21	0.00	Soil	1	1					
TP172	ASS2	19.9.21	2.50	Soil	1	1					
TP173	ASS1	19.9.21	0.00	Soil	1	1					
TP173	ASS2	19.9.21	2.40	Soil	1	1					
TP174	ASS1	19.9.21	0.00	Soil	1	1					
TP174	ASS2	19.9.21	1.60	Soil	1	1					
TP175	ASS1	19.9.21	0.00	Soil	1	1					
TP175	ASS2	19.9.21	2.10	Soil	1	1					
TP176	ASS1	19.9.21	0.00	Soil	1	1					
TP176	ASS2	19.9.21	1.40	Soil	1	1					
TP177	ASS1	19.9.21	0.00	Soil	1	1					
TP177	ASS2	19.9.21	2.30	Soil	1	1					
			TOTAL	**0**	**18**	**18**					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP002	ASS1	20.9.21	0.00	Soil	1	1					
TP002	ASS2	20.9.21	1.40	Soil	1	1					
TP003	ASS1	20.9.21	0.00	Soil	1	1					
TP003	ASS2	20.9.21	1.90	Soil	1	1					
TP178	ASS1	20.9.21	0.00	Soil	1	1					
TP178	ASS2	20.9.21	1.50	Soil	1	1					
TP179	ASS1	20.9.21	0.00	Soil	1	1					
TP179	ASS2	20.9.21	1.40	Soil	1	1					
TP197	ASS1	20.9.21	0.00	Soil	1	1					
TP197	ASS2	20.9.21	1.70	Soil	1	1					
TP198	ASS1	20.9.21	0.00	Soil	1	1					
TP198	ASS2	20.9.21	1.50	Soil	1	1					
TP199	ASS1	20.9.21	0.00	Soil	1	1					
TP199	ASS2	20.9.21	2.80	Soil	1	1					
TP200	ASS1	20.9.21	0.00	Soil	1	1					
TP200	ASS2	20.9.21	2.00	Soil	1	1					
TP201	ASS1	20.9.21	0.00	Soil	1	1					
TP201	ASS2	20.9.21	1.40	Soil	1	1					
TP202	ASS1	20.9.21	0.00	Soil	1	1					
TP202	ASS2	20.9.21	2.10	Soil	1	1					
TP203	ASS1	20.9.21	0.00	Soil	1	1					
TP203	ASS2	20.9.21	2.00	Soil	1	1					
			TOTAL	0	22	22					

ADDITIONAL COMMENTS:

829534
829537

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Attention: **Karen Mackenzie**

Report **829537-S**
Project name
Project ID W-AO
Received Date Sep 29, 2021

Client Sample ID			**ASS1_0_20.9.21_TP199**	**ASS2_2.8_20.9.21_TP199**	**ASS1_0_20.9.21_TP200**	**ASS2_2_20.9.21_TP200**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07002**	**L21-Oc07003**	**L21-Oc07004**	**L21-Oc07005**
Date Sampled			**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	8.4	7.9	8.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.8	8.9	7.1	8.8
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			**ASS1_0_20.9.21_TP201**	**ASS2_1.4_20.9.21_TP201**	**ASS1_0_20.9.21_TP202**	**ASS2_2.1_20.9.21_TP202**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07006**	**L21-Oc07007**	**L21-Oc07008**	**L21-Oc07009**
Date Sampled			**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**	**Sep 20, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.4	8.1	8.9	8.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.0	8.1	9.1	8.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			**ASS1_0_20.9.21_TP203**	**ASS2_2_20.9.21_TP203**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07010**	**L21-Oc07011**
Date Sampled			**Sep 20, 2021**	**Sep 20, 2021**
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	9.0	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.1
Reaction Ratings*[S05]	0	-	4.0	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acid Sulfate Soils Field pH Test	Welshpool	Oct 05, 2021	7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

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IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name:
Project ID: W-AO

Order No.: W-AO
Report #: 829537
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 2:08 PM
Due: Oct 13, 2021
Priority: 10 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	ASS1_0_20.9.21_TP199	Sep 20, 2021		Soil	L21-Oc07002		X
2	ASS2_2.8_20.9.21_TP199	Sep 20, 2021		Soil	L21-Oc07003		X
3	ASS1_0_20.9.21_TP200	Sep 20, 2021		Soil	L21-Oc07004		X
4	ASS2_2_20.9.21_TP200	Sep 20, 2021		Soil	L21-Oc07005		X
5	ASS1_0_20.9.21_TP201	Sep 20, 2021		Soil	L21-Oc07006		X
6	ASS2_1.4_20.	Sep 20, 2021		Soil	L21-Oc07007		X

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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Company Name: LWC Management Pty Ltd
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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	9.21_TP201						
7	ASS1_0_20.9.21_TP202	Sep 20, 2021		Soil	L21-Oc07008		X
8	ASS2_2.1_20.9.21_TP202	Sep 20, 2021		Soil	L21-Oc07009		X
9	ASS1_0_20.9.21_TP203	Sep 20, 2021		Soil	L21-Oc07010		X
10	ASS2_2_20.9.21_TP203	Sep 20, 2021		Soil	L21-Oc07011		X
11	ASS1_06.9.21_TP166	Sep 06, 2021		Soil	L21-Oc07013	X	
12	ASS2_06.9.21_TP166	Sep 06, 2021		Soil	L21-Oc07014	X	

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Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
13	ASS1_12.9.21_TP023	Sep 12, 2021		Soil	L21-Oc07017	X	
14	ASS2_12.9.21_TP023	Sep 12, 2021		Soil	L21-Oc07018	X	
15	ASS2_29.8.21_TP089_RED	Sep 12, 2021		Soil	L21-Oc07245	X	
Test Counts						5	10

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc07012	NCP	pH Units	9.7	9.4	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc07012	NCP	pH Units	10	9.7	pass	30%	Pass	
Reaction Ratings*	L21-Oc07012	NCP	-	4.0	4.0	pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Rhys Thomas Analytical Services Manager



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Karen Mackenzie
Project name:	Not provided
Project ID:	W-AO
Turnaround time:	5 Day
Date/Time received	Sep 29, 2021 2:08 PM
Eurofins reference	829537

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

ATTENTION: Missing sample TP082_ASS2_29.8.21 Extra sample TP082_ASS2_31.8.21 typo? Extra sample TP166_ASS1_6.9.21 and TP166_ASS2_6.9.21. Should be 4 TP023, 2 received no depths written, what would you like these samples called(TP023_ASS1_12.9.21 and TP023_ASS2_12.9.21) ? Duplicate sample both labelled ASS2_29.8.21_TP089 one is a red colour and one is brown, which would you like to be analysed ?

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Rhys Thomas on phone : (+61) 8 9251 9602 or by email: RhysThomas@eurofins.com

Results will be delivered electronically via email to Karen Mackenzie - kmackenzie@lwconsulting.com.au.

Global Leader - Results you can trust

Robert Johnston

From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Wednesday, 29 September 2021 11:17
To: Robert Johnston; Matthew Deaves
Cc: Riley Martin
Subject: LWC job no W-AO samples COC for dispatch of 21 September
Attachments: Test Pit ASS COC_DISPATCH_21SEPT21.xlsx; CHem Centre COC_29092021.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

EXTERNAL EMAIL*

Caitlyn Gibson A
Eurofins # 829534
829537

Hi All,

Please find attached the COC for the samples you received last week.

There are 9 samples to go to Chem Centre.

I'm working through the others now, will get back to you as soon as I can.

Cheers,

Karen

Dr Karen Mackenzie | Principal Geochemist

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From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP038	ASS1	26.8.21	0.00	Soil	1	1					
TP038	ASS2	26.8.21	1.80	Soil	1	1					
TP039	ASS1	26.8.21	0.00	Soil	1	1					
TP039	ASS2	26.8.21	2.10	Soil	1	1					
TP040	ASS1	26.8.21	0.00	Soil	1	1					
TP040	ASS2	26.8.21	2.10	Soil	1	1					
TP044	ASS1	26.8.21	0.00	Soil	1	1					
TP044	ASS2	26.8.21	2.60	Soil	1	1					
TP050	ASS1	26.8.21	0.00	Soil	1	1					
TP050	ASS2	26.8.21	2.00	Soil	1	1					
TP043	ASS1	26.8.21	0.00	Soil	1	1					
TP043	ASS2	26.8.21	3.00	Soil	1	1					
			TOTAL	**0**	**12**	**12**					

ADDITIONAL COMMENTS:

829534
829537

Date/Time: 29/9/21 2:08

Chilled: Yes / No

Temp: 15.4 16.0 16.6 15.3 12.5
16.3 11.9 14.2 12.8
12.4 12.6 14.9 14.5

Correction: -0.3

Final Temp:

14 °C

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP036	ASS1	27.8.21	0.00	Soil	1	1					
TP036	ASS4	27.8.21	3.00	Soil	1	1					
TP037	ASS1	27.8.21	0.00	Soil	1	1					
TP037	ASS2	27.8.21	3.00	Soil	1	1					
TP046	ASS1	27.8.21	0.00	Soil	1	1					
TP046	ASS2	27.8.21	1.30	Soil	1	1					
TP047	ASS3	27.8.21	0.00	Soil	1	1					
TP047	ASS4	27.8.21	2.00	Soil	1	1					
TP036	ASS2	27.8.21	0.00	Soil	1	1					
			TOTAL	0	9	9					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

LWC Project No:
W-AO
Project Manager:
Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP080	ASS1	29.8.21	0.00	Soil	1	1					
TP080	ASS2	29.8.21	2.20	Soil	1	1					
TP081	ASS1	29.8.21	0.00	Soil	1	1					
TP081	ASS2	29.8.21	2.30	Soil	1	1					
TP085	ASS1	29.8.21	0.00	Soil	1	1					
TP085	ASS4	29.8.21	2.60	Soil	1	1					
TP086	ASS1	29.8.21	0.00	Soil	1	1					
TP086	ASS2	29.8.21	1.60	Soil	1	1					
TP087	ASS1	29.8.21	0.00	Soil	1	1					
TP087	ASS4	29.8.21	1.60	Soil	1	1					
TP090	ASS1	29.8.21	0.00	Soil	1	1					
TP090	ASS2	29.8.21	2.20	Soil	1	1					
TP092	ASS1	29.8.21	0.00	Soil	1	1					
TP092	ASS2	29.8.21	2.20	Soil	1	1					
TP095	ASS1	29.8.21	0	Soil	1	1					
TP095	ASS2	29.8.21	1.9	Soil	1	1					
TP096	ASS1	29.8.21	0	Soil	1	1					
TP096	ASS2	29.8.21	2	Soil	1	1					
TP085	ASS2	29.8.21	0.00	Soil	1	1					
TP087	ASS2	29.8.21	0.00	Soil	1	1					
			TOTAL	0	20	20					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP082	ASS1	31.8.21	0.00	Soil	1	1					
TP082	ASS4	31.8.21	2.40	Soil	1	1					
TP083	ASS1	31.8.21	0.00	Soil	1	1					
TP083	ASS2	31.8.21	1.50	Soil	1	1					
TP145	ASS1	31.8.21	0.00	Soil	1	1					
TP145	ASS2	31.8.21	1.70	Soil	1	1					
TP186	ASS1	31.8.21	0.00	Soil	1	1					
TP186	ASS2	31.8.21	2.00	Soil	1	1					
TP187	ASS1	31.8.21	0.00	Soil	1	1					
TP187	ASS4	31.8.21	2.10	Soil	1	1					
TP188	ASS1	31.8.21	0.00	Soil	1	1					
TP188	ASS2	31.8.21	2.40	Soil	1	1					
TP189	ASS1	31.8.21	0.00	Soil	1	1					
TP189	ASS4	31.8.21	1.50	Soil	1	1					
TP190	ASS1	31.8.21	0	Soil	1	1					
TP190	ASS2	31.8.21	2.3	Soil	1	1					
TP082	ASS2	29/08/2021	0.00	Soil	1	1					
TP189	ASS2	29/08/2021	0.00	Soil	1	1					
			TOTAL	0	18	18					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

LWC Project No:
W-AO
Project Manager:
Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP185	ASS1	01.9.21	0.00	Soil	1	1					
TP185	ASS2	01.9.21	2.70	Soil	1	1					
TP191	ASS1	01.9.21	0.00	Soil	1	1					
TP191	ASS4	01.9.21	2.40	Soil	1	1					
TP191	ASS2	01.9.21	0.00	Soil	1	1					

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP008	ASS1	06.9.21	0.00	Soil	1	1					
TP008	ASS2	06.9.21	2.10	Soil	1	1					
TP007	ASS1	06.9.21	0.00	Soil	1	1					
TP007	ASS2	06.9.21	1.90	Soil	1	1					
TP006	ASS1	06.9.21	0.00	Soil	1	1					
TP006	ASS2	06.9.21	2.10	Soil	1	1					
TP005	ASS1	06.9.21	0.00	Soil	1	1					
TP005	ASS2	06.9.21	0.50	Soil	1	1					
TP005	ASS3	06.9.21	1.00	Soil	1	1					
TP005	ASS4	06.9.21	1.50	Soil	1	1					
TP005	ASS5	06.9.21	2.00	Soil	1	1					
TP005	ASS6	06.9.21	2.50	Soil	1	1					
TP163	ASS1	06.9.21	0.00	Soil	1	1					
TP163	ASS2	06.9.21	1.50	Soil	1	1					
TP164	ASS1	06.9.21	0.00	Soil	1	1					
TP164	ASS2	06.9.21	2.60	Soil	1	1					
TP169	ASS1	06.9.21	0.00	Soil	1	1					
TP169	ASS4	06.9.21	2.00	Soil	1	1					
TP165	ASS1	06.9.21	0.00	Soil	1	1					
TP165	ASS2	06.9.21	3.00	Soil	1	1					
TP153	ASS1	06.9.21	0.00	Soil	1	1					
TP153	ASS2	06.9.21	2.00	Soil	1	1					
TP005	ASS7	6/09/2021	2.50	Soil	1	1					
TP169	ASS2	6/09/2021	0.00	Soil	1	1					
			TOTAL	0	24	24					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

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Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP154	ASS1	07.9.21	0.00	Soil	1	1					
TP154	ASS2	07.9.21	2.00	Soil	1	1					
TP155	ASS1	07.9.21	0.00	Soil	1	1					
TP155	ASS2	07.9.21	3.00	Soil	1	1					
TP156	ASS1	07.9.21	0.00	Soil	1	1					
TP156	ASS2	07.9.21	1.80	Soil	1	1					
TP157	ASS1	07.9.21	0.00	Soil	1	1					
TP157	ASS2	07.9.21	0.50	Soil	1	1					
TP157	ASS3	07.9.21	1.00	Soil	1	1					
TP157	ASS4	07.9.21	1.50	Soil	1	1					
TP157	ASS5	07.9.21	2.00	Soil	1	1					
TP157	ASS6	07.9.21	2.50	Soil	1	1					
TP157	ASS7	07.9.21	2.80	Soil	1	1					
TP158	ASS1	07.9.21	0.00	Soil	1	1					
TP158	ASS2	07.9.21	0.50	Soil	1	1					
TP158	ASS3	07.9.21	1.00	Soil	1	1					
TP158	ASS4	07.9.21	1.20	Soil	1	1					
TP159	ASS1	07.9.21	0.00	Soil	1	1					
TP159	ASS2	07.9.21	0.50	Soil	1	1					
TP159	ASS3	07.9.21	1.00	Soil	1	1					
TP159	ASS4	07.9.21	1.50	Soil	1	1					
TP159	ASS5	07.9.21	2.00	Soil	1	1					
TP159	ASS6	07.9.21	2.40	Soil	1	1					
TP160	ASS1	07.9.21	0.00	Soil	1	1					
TP160	ASS2	07.9.21	2.10	Soil	1	1					
TP009	ASS1	07.9.21	0.00	Soil	1	1					
TP009	ASS2	07.9.21	2.10	Soil	1	1					
TP010	ASS1	07.9.21	0.00	Soil	1	1					
TP010	ASS2	07.9.21	1.90	Soil	1	1					
TP011	ASS1	07.9.21	0.00	Soil	1	1					
TP011	ASS2	07.9.21	1.70	Soil	1	1					
			TOTAL	0	31	31					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

LWC Project No:
W-AO
Project Manager:
Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP182	ASS1	09.9.21	0.00	Soil	1	1					
TP182	ASS2	09.9.21	1.20	Soil	1	1					
TP180	ASS1	09.9.21	0.00	Soil	1	1					
TP180	ASS2	09.9.21	2.80	Soil	1	1					
TP168	ASS1	09.9.21	0.00	Soil	1	1					
TP168	ASS2	09.9.21	1.70	Soil	1	1					
TP152	ASS1	09.9.21	0.00	Soil	1	1					
TP152	ASS2	09.9.21	2.10	Soil	1	1					
TP162	ASS1`	09.9.21	0.00	Soil	1	1					
TP162	ASS2	09.9.21	1.40	Soil	1	1					
TP151	ASS1	09.9.21	0.00	Soil	1	1					
TP151	ASS2	09.9.21	1.40	Soil	1	1					
			TOTAL	0	12	12					

ADDITIONAL COMMENTS:

Check integrity of bags

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP167	ASS1	10.9.21	0.00	Soil	1	1					
TP167	ASS2	10.9.21	2.10	Soil	1	1					
TP181	ASS1	10.9.21	0.00	Soil	1	1					
TP181	ASS4	10.9.21	2.30	Soil	1	1					
TP183	ASS1	10.9.21	0.00	Soil	1	1					
TP183	ASS2	10.9.21	1.80	Soil	1	1					
TP184	ASS1	10.9.21	0.00	Soil	1	1					
TP184	ASS2	10.9.21	1.50	Soil	1	1					
TP147	ASS1`	10.9.21	0.00	Soil	1	1					
TP147	ASS2	10.9.21	1.30	Soil	1	1					
TP148	ASS1	10.9.21	0.00	Soil	1	1					
TP148	ASS2	10.9.21	1.70	Soil	1	1					
TP149	ASS1	10.9.21	0.00	Soil	1	1					
TP149	ASS2	10.9.21	2.10	Soil	1	1					
TP150	ASS1	10.9.21	0.00	Soil	1	1					
TP150	ASS2	10.9.21	1.30	Soil	1	1					
TP135	ASS1	10.9.21	0.00	Soil	1	1					
TP135	ASS2	10.9.21	0.90	Soil	1	1					
TP134	ASS1	10.9.21	0.00	Soil	1	1					
TP134	ASS2	10.9.21	1.80	Soil	1	1					
TP133	ASS1	10.9.21	0.00	Soil	1	1					
TP133	ASS2	10.9.21	2.20	Soil	1	1					
TP181	ASS2	10.9.21	0.00	Soil	1	1					
			TOTAL	0	23	23					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP132	ASS1	11.9.21	0.00	Soil	1	1					
TP132	ASS2	11.9.21	1.60	Soil	1	1					
TP131	ASS1	11.9.21	0.00	Soil	1	1					
TP131	ASS2	11.9.21	1.00	Soil	1	1					
TP130	ASS1	11.9.21	0.00	Soil	1	1					
TP130	ASS2	11.9.21	0.50	Soil	1	1					
TP130	ASS3	11.9.21	1.00	Soil	1	1					
TP130	ASS4	11.9.21	1.50	Soil	1	1					
TP130	ASS5	11.9.21	2.00	Soil	1	1					
TP012	ASS1	11.9.21	0.00	Soil	1	1					
TP012	ASS2	11.9.21	3.00	Soil	1	1					
TP013	ASS1	11.9.21	0.00	Soil	1	1					
TP013	ASS2	11.9.21	0.70	Soil	1	1					
TP014	ASS1	11.9.21	0.00	Soil	1	1					
TP014	ASS2	11.9.21	0.90	Soil	1	1					
TP015	ASS1	11.9.21	0.00	Soil	1	1					
TP015	ASS2	11.9.21	0.50	Soil	1	1					
TP015	ASS3	11.9.21	1.00	Soil	1	1					
TP015	ASS4	11.9.21	1.50	Soil	1	1					
TP016	ASS1	11.9.21	0.00	Soil	1	1					
TP016	ASS2	11.9.21	0.50	Soil	1	1					
TP016	ASS3	11.9.21	1.10	Soil	1	1					
TP016	ASS4	11.9.21	2.60	Soil	1	1					
TP017	ASS1	11.9.21	0.00	Soil	1	1					
TP017	ASS2	11.9.21	0.80	Soil	1	1					
TP018	ASS1	11.9.21	0.00	Soil	1	1					
TP018	ASS2	11.9.21	3.00	Soil	1	1					
			TOTAL	**0**	**27**	**27**					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	phF	pHfox					
TP019	ASS1	12.9.21	0.00	Soil	1	1					
TP019	ASS2	12.9.21	2.40	Soil	1	1					
TP020	ASS1	12.9.21	0.00	Soil	1	1					
TP020	ASS2	12.9.21	3.10	Soil	1	1					
TP021	ASS1	12.9.21	0.00	Soil	1	1					
TP021	ASS2	12.9.21	3.00	Soil	1	1					
TP022	ASS1	12.9.21	0.00	Soil	1	1					
TP022	ASS2	12.9.21	3.00	Soil	1	1					
TP023	ASS1`	12.9.21		Soil	1	1					
TP023	ASS2	12.9.21		Soil	1	1					
				Soil	1	1					
				Soil	1	1					
TP024	ASS1	12.9.21	0.00	Soil	1	1					
TP024	ASS2	12.9.21	1.70	Soil	1	1					
TP025	ASS1	12.9.21	0.00	Soil	1	1					
TP025	ASS2	12.9.21	3.00	Soil	1	1					
TP026	ASS1	12.9.21	0.00	Soil	1	1					
TP026	ASS2	12.9.21	3.00	Soil	1	1					
TP027	ASS1	12.9.21	0.00	Soil	1	1					
TP027	ASS2	12.9.21	2.80	Soil	1	1					
TP028	ASS1	12.9.21	0.00	Soil	1	1					
TP028	ASS2	12.9.21	2.10	Soil	1	1					
TP029	ASS1	12.9.21	0.00	Soil	1	1					
TP029	ASS2	12.9.21	1.60	Soil	1	1					
			TOTAL	0	24	24					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP030	ASS1	13.9.21	0.00	Soil	1	1					
TP030	ASS2	13.9.21	1.80	Soil	1	1					
TP031	ASS1	13.9.21	0.00	Soil	1	1					
TP031	ASS2	13.9.21	1.40	Soil	1	1					
TP032	ASS1	13.9.21	0.00	Soil	1	1					
TP032	ASS2	13.9.21	0.90	Soil	1	1					
TP033	ASS1	13.9.21	0.00	Soil	1	1					
TP033	ASS2	13.9.21	0.80	Soil	1	1					
			TOTAL	0	8	8					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP274	ASS1	17.9.21	0.00	Soil	1	1					
TP274	ASS2	17.9.21	2.30	Soil	1	1					
TP275	ASS1	17.9.21	0.00	Soil	1	1					
TP275	ASS2	17.9.21	1.00	Soil	1	1					
TP276	ASS1	17.9.21	0.00	Soil	1	1					
TP276	ASS2	17.9.21	1.50	Soil	1	1					
TP278	ASS1	17.9.21	0.00	Soil	1	1					
TP278	ASS2	17.9.21	2.00	Soil	1	1					
			TOTAL	0	8	8					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP136	ASS1	18.9.21	0.00	Soil	1	1					
TP136	ASS2	18.9.21	2.00	Soil	1	1					
TP137	ASS1	18.9.21	0.00	Soil	1	1					
TP137	ASS2	18.9.21	2.20	Soil	1	1					
			TOTAL	0	4	4					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP004	ASS1	19.9.21	0.00	Soil	1	1					
TP004	ASS2	19.9.21	2.60	Soil	1	1					
TP170	ASS1	19.9.21	0.00	Soil	1	1					
TP170	ASS2	19.9.21	2.20	Soil	1	1					
TP171	ASS1	19.9.21	0.00	Soil	1	1					
TP171	ASS2	19.9.21	1.40	Soil	1	1					
TP172	ASS1	19.9.21	0.00	Soil	1	1					
TP172	ASS2	19.9.21	2.50	Soil	1	1					
TP173	ASS1	19.9.21	0.00	Soil	1	1					
TP173	ASS2	19.9.21	2.40	Soil	1	1					
TP174	ASS1	19.9.21	0.00	Soil	1	1					
TP174	ASS2	19.9.21	1.60	Soil	1	1					
TP175	ASS1	19.9.21	0.00	Soil	1	1					
TP175	ASS2	19.9.21	2.10	Soil	1	1					
TP176	ASS1	19.9.21	0.00	Soil	1	1					
TP176	ASS2	19.9.21	1.40	Soil	1	1					
TP177	ASS1	19.9.21	0.00	Soil	1	1					
TP177	ASS2	19.9.21	2.30	Soil	1	1					
			TOTAL	**0**	**18**	**18**					

ADDITIONAL COMMENTS:

829534
829537

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	pHf	pHfox					
TP002	ASS1	20.9.21	0.00	Soil	1	1					
TP002	ASS2	20.9.21	1.40	Soil	1	1					
TP003	ASS1	20.9.21	0.00	Soil	1	1					
TP003	ASS2	20.9.21	1.90	Soil	1	1					
TP178	ASS1	20.9.21	0.00	Soil	1	1					
TP178	ASS2	20.9.21	1.50	Soil	1	1					
TP179	ASS1	20.9.21	0.00	Soil	1	1					
TP179	ASS2	20.9.21	1.40	Soil	1	1					
TP197	ASS1	20.9.21	0.00	Soil	1	1					
TP197	ASS2	20.9.21	1.70	Soil	1	1					
TP198	ASS1	20.9.21	0.00	Soil	1	1					
TP198	ASS2	20.9.21	1.50	Soil	1	1					
TP199	ASS1	20.9.21	0.00	Soil	1	1					
TP199	ASS2	20.9.21	2.80	Soil	1	1					
TP200	ASS1	20.9.21	0.00	Soil	1	1					
TP200	ASS2	20.9.21	2.00	Soil	1	1					
TP201	ASS1	20.9.21	0.00	Soil	1	1					
TP201	ASS2	20.9.21	1.40	Soil	1	1					
TP202	ASS1	20.9.21	0.00	Soil	1	1					
TP202	ASS2	20.9.21	2.10	Soil	1	1					
TP203	ASS1	20.9.21	0.00	Soil	1	1					
TP203	ASS2	20.9.21	2.00	Soil	1	1					
			TOTAL	0	22	22					

ADDITIONAL COMMENTS:

829534
829537

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Attention: **Karen Mackenzie**

Report **829635-S**
Project name
Project ID W-AO
Received Date Sep 29, 2021

Client Sample ID			**ASS1_0_19.8.21_TP059**	**ASS2_0.5_19.8.21_TP059**	**ASS9_3_19.8.21_TP059**	**ASS1_0_19.8.21_TP060**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07718**	**L21-Oc07719**	**L21-Oc07720**	**L21-Oc07721**
Date Sampled			**Aug 19, 2021**	**Aug 19, 2021**	**Aug 19, 2021**	**Aug 19, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	9.7	10	7.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.3	9.7	10	8.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			**ASS7_2.5_19.8.21_TP060**	**ASS1_0_20.8.21_TP058**	**ASS7_3_20.8.21_TP058**	**ASS1_0_20.8.21_TP057**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07722**	**L21-Oc07723**	**L21-Oc07724**	**L21-Oc07725**
Date Sampled			**Aug 19, 2021**	**Aug 20, 2021**	**Aug 20, 2021**	**Aug 20, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	9.0	10	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.7	7.6	11	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			**ASS7_3_20.8.21_TP057**	**ASS1_0_21.8.21_TP068**	**ASS5_2.1_21.8.21_TP068**	**ASS1_0_21.8.21_TP069**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07726**	**L21-Oc07727**	**L21-Oc07728**	**L21-Oc07729**
Date Sampled			**Aug 20, 2021**	**Aug 21, 2021**	**Aug 21, 2021**	**Aug 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	10	9.6	9.9	8.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	10	9.5	10	8.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS6_2.4_21.8.21_TP069	ASS1_0_21.8.21_TP061	ASS5_2_21.8.21_TP061	ASS1_0_21.8.21_TP062
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07730**	**L21-Oc07731**	**L21-Oc07732**	**L21-Oc07733**
Date Sampled			**Aug 21, 2021**	**Aug 21, 2021**	**Aug 21, 2021**	**Aug 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.8	9.0	9.1	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	10	9.1	9.2	9.3
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS7_3_21.8.21_TP062	ASS1_0_21.8.21_TP063	ASS7_2.7_21.8.21_TP063	ASS1_0_21.8.21_TP064
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07734**	**L21-Oc07735**	**L21-Oc07736**	**L21-Oc07737**
Date Sampled			**Aug 21, 2021**	**Aug 21, 2021**	**Aug 21, 2021**	**Aug 21, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.9	9.0	10	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	10	9.4	10	8.8
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS5_2_21.8.21_TP064	ASS1_0_22.8.21_TP071	ASS6_2.3_22.8.21_TP071	ASS1_0_22.8.21_TP072
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07738**	**L21-Oc07741**	**L21-Oc07742**	**L21-Oc07743**
Date Sampled			**Aug 21, 2021**	**Aug 22, 2021**	**Aug 22, 2021**	**Aug 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.0	9.4	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.7	9.4	9.4	9.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS6_2.3_22.8.21_TP072	ASS1_0_22.8.21_TP073	ASS5_2.1_22.8.21_TP073	ASS1_0_22.8.21_TP065
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07744**	**L21-Oc07745**	**L21-Oc07746**	**L21-Oc07747**
Date Sampled			**Aug 22, 2021**	**Aug 22, 2021**	**Aug 22, 2021**	**Aug 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	9.4	9.5	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.8	9.6	9.9
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS6_2.2_22.8.21_TP065	ASS1_0_22.8.21_TP066	ASS7_3_22.8.21_TP066	ASS1_0_22.8.21_TP067
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07748**	**L21-Oc07749**	**L21-Oc07750**	**L21-Oc07751**
Date Sampled			**Aug 22, 2021**	**Aug 22, 2021**	**Aug 22, 2021**	**Aug 22, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	9.0	9.9	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.0	8.8	10	9.5
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS5_2_22.8.21_TP067	ASS1_0_23.8.21_TP079	ASS1_0_23.8.21_TP075	ASS4_1.5_23.8.21_TP075
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07752**	**L21-Oc07753**	**L21-Oc07755**	**L21-Oc07756**
Date Sampled			**Aug 22, 2021**	**Aug 23, 2021**	**Aug 23, 2021**	**Aug 23, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.9	9.3	9.4	9.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.9	8.6	7.6	7.1
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_23.8.21_TP076	ASS6_2.4_23.8.21_TP076	ASS1_0_23.8.21_TP077	ASS5_2_23.8.21_TP077
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07757**	**L21-Oc07758**	**L21-Oc07759**	**L21-Oc07760**
Date Sampled			**Aug 23, 2021**	**Aug 23, 2021**	**Aug 23, 2021**	**Aug 23, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	9.8	8.9	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.6	9.9	9.0	9.7
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_23.8.21_TP078	ASS7_3_23.8.21_TP078	ASS1_0_23.8.21_TP070	ASS7_3_23.8.21_TP070
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc07761**	**L21-Oc07762**	**L21-Oc07763**	**L21-Oc07764**
Date Sampled			**Aug 23, 2021**	**Aug 23, 2021**	**Aug 23, 2021**	**Aug 23, 2021**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	8.4	8.7	9.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.4	8.8	7.7	9.8
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_24.8.21_TP074	ASS4_1.8_23.8.21_TP074	ASS1_0_25.8.21_TP055	ASS2_0_25.8.21_TP055
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-Oc07765	L21-Oc07766	L21-Oc07767	L21-Oc07768
Date Sampled			Aug 24, 2021	Aug 23, 2021	Aug 25, 2021	Aug 25, 2021
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	9.7	9.2	9.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.1	9.8	9.1	8.6
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS4_1.5_25.8.21_TP055	ASS1_0_25.8.21_TP054	ASS2_2.1_25.8.21_TP054	ASS2_2.4_25.8.21_TP052
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-Oc07769	L21-Oc07770	L21-Oc07771	L21-Oc07772
Date Sampled			Aug 25, 2021	Aug 25, 2021	Aug 25, 2021	Aug 25, 2021
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	9.0	9.3	9.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.3	9.4	9.7	10
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS1_0_25.8.21_TP051	ASS2_0_25.8.21_TP051	ASS2_2.2_25.8.21_TP042	ASS1_0_25.8.21_TP041
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-Oc07773	L21-Oc07774	L21-Oc07775	L21-Oc07776
Date Sampled			Aug 25, 2021	Aug 25, 2021	Aug 25, 2021	Aug 25, 2021
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.4	9.4	9.8	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.4	9.9	10	9.4
Reaction Ratings*[S05]	0	-	4.0	4.0	4.0	4.0

Client Sample ID			ASS2_3_25.8.21_TP041
Sample Matrix			Soil
Eurofins Sample No.			L21-Oc07777
Date Sampled			Aug 25, 2021
Test/Reference	LOR	Unit	
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	9.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	9.8
Reaction Ratings*[S05]	0	-	4.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acid Sulfate Soils Field pH Test	Welshpool	Oct 05, 2021	7 Days

- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests

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NATA # 1261 Site # 1254

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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Project Name:
Project ID: W-AO

Order No.: W-AO
Report #: 829635
Phone: 08 8271 5255
Fax:

Received: Sep 29, 2021 11:43 AM
Due: Oct 8, 2021
Priority: 7 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	ASS1_0_19.8.21_TP059	Aug 19, 2021		Soil	L21-Oc07718		X
2	ASS2_0.5_19.8.21_TP059	Aug 19, 2021		Soil	L21-Oc07719		X
3	ASS9_3_19.8.21_TP059	Aug 19, 2021		Soil	L21-Oc07720		X
4	ASS1_0_19.8.21_TP060	Aug 19, 2021		Soil	L21-Oc07721		X
5	ASS7_2.5_19.8.21_TP060	Aug 19, 2021		Soil	L21-Oc07722		X
6	ASS1_0_20.8.	Aug 20, 2021		Soil	L21-Oc07723		X

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Company Name: LWC Management Pty Ltd
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Perth
WA 6000

Project Name:
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Received: Sep 29, 2021 11:43 AM
Due: Oct 8, 2021
Priority: 7 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP058						
7	ASS7_3_20.8.21_TP058	Aug 20, 2021		Soil	L21-Oc07724		X
8	ASS1_0_20.8.21_TP057	Aug 20, 2021		Soil	L21-Oc07725		X
9	ASS7_3_20.8.21_TP057	Aug 20, 2021		Soil	L21-Oc07726		X
10	ASS1_0_21.8.21_TP068	Aug 21, 2021		Soil	L21-Oc07727		X
11	ASS5_2.1_21.8.21_TP068	Aug 21, 2021		Soil	L21-Oc07728		X
12	ASS1_0_21.8.21_TP069	Aug 21, 2021		Soil	L21-Oc07729		X

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Phone : +61 2 9900 8400
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1/21 Smallwood Place
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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Priority: 7 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						HOLD	Acid Sulfate Soils Field pH Test
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
13	ASS6_2.4_21.8.21_TP069	Aug 21, 2021		Soil	L21-Oc07730		X
14	ASS1_0_21.8.21_TP061	Aug 21, 2021		Soil	L21-Oc07731		X
15	ASS5_2_21.8.21_TP061	Aug 21, 2021		Soil	L21-Oc07732		X
16	ASS1_0_21.8.21_TP062	Aug 21, 2021		Soil	L21-Oc07733		X
17	ASS7_3_21.8.21_TP062	Aug 21, 2021		Soil	L21-Oc07734		X
18	ASS1_0_21.8.21_TP063	Aug 21, 2021		Soil	L21-Oc07735		X
19	ASS7_2.7_21.	Aug 21, 2021		Soil	L21-Oc07736		X

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Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	8.21_TP063						
20	ASS1_0_21.8.21_TP064	Aug 21, 2021		Soil	L21-Oc07737		X
21	ASS5_2_21.8.21_TP064	Aug 21, 2021		Soil	L21-Oc07738		X
22	ASS1_0_21.8.21_TP056	Aug 21, 2021		Soil	L21-Oc07739	X	
23	ASS4_1.5_21.8.21_TP056	Aug 21, 2021		Soil	L21-Oc07740	X	
24	ASS1_0_22.8.21_TP071	Aug 22, 2021		Soil	L21-Oc07741		X
25	ASS6_2.3_22.8.21_TP071	Aug 22, 2021		Soil	L21-Oc07742		X

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Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
26	ASS1_0_22.8.21_TP072	Aug 22, 2021		Soil	L21-Oc07743		X
27	ASS6_2.3_22.8.21_TP072	Aug 22, 2021		Soil	L21-Oc07744		X
28	ASS1_0_22.8.21_TP073	Aug 22, 2021		Soil	L21-Oc07745		X
29	ASS5_2.1_22.8.21_TP073	Aug 22, 2021		Soil	L21-Oc07746		X
30	ASS1_0_22.8.21_TP065	Aug 22, 2021		Soil	L21-Oc07747		X
31	ASS6_2.2_22.8.21_TP065	Aug 22, 2021		Soil	L21-Oc07748		X
32	ASS1_0_22.8.	Aug 22, 2021		Soil	L21-Oc07749		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP066						
33	ASS7_3_22.8.21_TP066	Aug 22, 2021		Soil	L21-Oc07750		X
34	ASS1_0_22.8.21_TP067	Aug 22, 2021		Soil	L21-Oc07751		X
35	ASS5_2_22.8.21_TP067	Aug 22, 2021		Soil	L21-Oc07752		X
36	ASS1_0_23.8.21_TP079	Aug 23, 2021		Soil	L21-Oc07753		X
37	ASS6_2.3_23.8.21_TP079	Aug 23, 2021		Soil	L21-Oc07754	X	
38	ASS1_0_23.8.21_TP075	Aug 23, 2021		Soil	L21-Oc07755		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
39	ASS4_1.5_23.8.21_TP075	Aug 23, 2021		Soil	L21-Oc07756		X
40	ASS1_0_23.8.21_TP076	Aug 23, 2021		Soil	L21-Oc07757		X
41	ASS6_2.4_23.8.21_TP076	Aug 23, 2021		Soil	L21-Oc07758		X
42	ASS1_0_23.8.21_TP077	Aug 23, 2021		Soil	L21-Oc07759		X
43	ASS5_2_23.8.21_TP077	Aug 23, 2021		Soil	L21-Oc07760		X
44	ASS1_0_23.8.21_TP078	Aug 23, 2021		Soil	L21-Oc07761		X
45	ASS7_3_23.8.	Aug 23, 2021		Soil	L21-Oc07762		X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
	21_TP078						
46	ASS1_0_23.8.21_TP070	Aug 23, 2021		Soil	L21-Oc07763		X
47	ASS7_3_23.8.21_TP070	Aug 23, 2021		Soil	L21-Oc07764		X
48	ASS1_0_24.8.21_TP074	Aug 24, 2021		Soil	L21-Oc07765		X
49	ASS4_1.8_23.8.21_TP074	Aug 23, 2021		Soil	L21-Oc07766		X
50	ASS1_0_25.8.21_TP055	Aug 25, 2021		Soil	L21-Oc07767		X
51	ASS2_0_25.8.21_TP055	Aug 25, 2021		Soil	L21-Oc07768		X

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Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
52	ASS4_1.5_25.8.21_TP055	Aug 25, 2021		Soil	L21-Oc07769		X
53	ASS1_0_25.8.21_TP054	Aug 25, 2021		Soil	L21-Oc07770		X
54	ASS2_2.1_25.8.21_TP054	Aug 25, 2021		Soil	L21-Oc07771		X
55	ASS2_2.4_25.8.21_TP052	Aug 25, 2021		Soil	L21-Oc07772		X
56	ASS1_0_25.8.21_TP051	Aug 25, 2021		Soil	L21-Oc07773		X
57	ASS2_0_25.8.21_TP051	Aug 25, 2021		Soil	L21-Oc07774		X
58	ASS2_2.2_25.	Aug 25, 2021		Soil	L21-Oc07775		X

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Sydney Laboratory - NATA # 1261 Site # 18217							
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External Laboratory							
	8.21_TP042						
59	ASS1_0_25.8.21_TP041	Aug 25, 2021		Soil	L21-Oc07776		X
60	ASS2_3_25.8.21_TP041	Aug 25, 2021		Soil	L21-Oc07777		X
Test Counts						3	57

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc07718	CP	pH Units	8.9	9.1	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc07718	CP	pH Units	8.3	8.6	pass	30%	Pass	
Reaction Ratings*	L21-Oc07718	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc07728	CP	pH Units	9.9	9.9	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc07728	CP	pH Units	10	10	pass	30%	Pass	
Reaction Ratings*	L21-Oc07728	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc07738	CP	pH Units	9.5	9.7	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc07738	CP	pH Units	9.7	9.9	pass	30%	Pass	
Reaction Ratings*	L21-Oc07738	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc07748	CP	pH Units	9.1	9.1	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc07748	CP	pH Units	9.0	9.0	pass	30%	Pass	
Reaction Ratings*	L21-Oc07748	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc07758	CP	pH Units	9.8	9.9	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc07758	CP	pH Units	9.9	9.9	pass	30%	Pass	
Reaction Ratings*	L21-Oc07758	CP	-	4.0	4.0	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc07768	CP	pH Units	9.1	9.2	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc07768	CP	pH Units	8.6	8.6	pass	30%	Pass	
Reaction Ratings*	L21-Oc07768	CP	-	4.0	4.0	pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Rhys Thomas Analytical Services Manager



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

eurofins | ARL

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IANZ # 1327

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43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Karen Mackenzie
Project name:	Not provided
Project ID:	W-AO
Turnaround time:	5 Day
Date/Time received	Sep 29, 2021 11:43 AM
Eurofins reference	829635

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

ATTENTION: Mislabelled samples; COC states-TP56_ASS1_21/8/21, TP56_ASS2_21/8/21, TP56_ASS3_21/8/21,TP56_ASS4_21/8/21. Samples labelled-TP07_ASS1_21/8/21,TP07_ASS2_21/8/21,TP07_ASS3_21/8/21,TP07_ASS4_21/8/21.Is this a typo? Extra sample labelled TP077_ASS6_23/8/21, missing sample TP079_ASS6_23/8/21 typo?

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Rhys Thomas on phone : (+61) 8 9251 9602 or by email: RhysThomas@eurofins.com

Results will be delivered electronically via email to Karen Mackenzie - kmackenzie@lwconsulting.com.au.

Robert Johnston

From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Wednesday, 29 September 2021 11:43
To: Robert Johnston; Matthew Deaves
Cc: Riley Martin
Subject: Revised COC for Test pit samples on HOLD form 26 August
Attachments: Chain of Custody_DISPATCH_26AUG21_Rev1.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL*

Hi All,

Please find the revised COC for the samples that were on hold from 26 August.

There should be 59 samples selected for Eurofins to analyse with 4 samples to go to the chemistry centre if they haven't already.

Kind regards,

Karen

Caitlyn Gibson
Eurofins # 829635

Dr Karen Mackenzie | Principal Geochemist

Land & Water Consulting
Core Innovation Hub, Level Seven,
191 St Georges Terrace, Perth, WA 6000
M: +61 448 682 774
kmackenzie@lwconsulting.com.au | www.lwconsulting.com.au

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CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

LWC Project No:
W-AO
Project Manager:
Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	HOLD	pHf	pHfox				
TP059	ASS1	19.8.21	0.00	Soil		1	1				
TP059	ASS2	19.8.21	0.50	Soil		1	1				
TP059	ASS3	19.8.21	0.50	Soil	x						
TP059	ASS5	19.8.21	1.00	Soil	x						
TP059	ASS6	19.8.21	1.50	Soil	x						
TP059	ASS7	19.8.21	2.00	Soil	x						
TP059	ASS8	19.8.21	2.50	Soil	x						
TP059	ASS9	19.8.21	3.00	Soil		1	1				
TP060	ASS1	19.8.21	0.00	Soil		1	1				
TP060	ASS2	19.8.21	0.50	Soil	x						
TP060	ASS3	19.8.21	1.00	Soil	x						
TP060	ASS4	19.8.21	1.50	Soil	x						
TP060	ASS5	19.8.21	2.00	Soil							
TP060	ASS6	19.8.21	2.50	Soil							
TP060	ASS7	19.8.21	3.00	Soil	x	1	1				
			TOTAL	0	0	5	5				

ADDITIONAL COMMENTS:

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	HOLD	pHf	pHfox				
TP058	ASS1	20.8.21	0.00	Soil		1	1				
TP058	ASS2	20.8.21	0.50	Soil	x						
TP058	ASS3	20.8.21	1.00	Soil	x						
TP058	ASS4	20.8.21	1.50	Soil	x						
TP058	ASS5	20.8.21	2.00	Soil	x						
TP058	ASS6	20.8.21	2.50	Soil	x						
TP058	ASS7	20.8.21	3.00	Soil		1	1				
TP057	ASS1	20.8.21	0.00	Soil		1	1				
TP057	ASS2	20.8.21	0.50	Soil	x						
TP057	ASS3	20.8.21	1.00	Soil	x						
TP057	ASS4	20.8.21	1.50	Soil	x						
TP057	ASS5	20.8.21	2.00	Soil	x						
TP057	ASS6	20.8.21	2.50	Soil	x						
TP057	ASS7	20.8.21	3.00	Soil		1	1				
			TOTAL	**0**	**0**	**4**	**4**				

ADDITIONAL COMMENTS:

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	HOLD	pHf	pHfox				
TP068	ASS1	21.8.21	0.00	Soil		1	1				
TP068	ASS2	21.8.21	0.50	Soil	x						
TP068	ASS3	21.8.21	1.00	Soil	x						
TP068	ASS4	21.8.21	1.50	Soil	x						
TP068	ASS5	21.8.21	2.10	Soil		1	1				
TP069	ASS1	21.8.21	0.00	Soil		1	1				
TP069	ASS2	21.8.21	0.50	Soil	x						
TP069	ASS3	21.8.21	1.00	Soil	x						
TP069	ASS4	21.8.21	1.50	Soil	x						
TP069	ASS5	21.8.21	2.00	Soil	x						
TP069	ASS6	21.8.21	2.40	Soil		1	1				
TP061	ASS1	21.8.21	0.00	Soil		1	1				
TP061	ASS2	21.8.21	0.50	Soil	x						
TP061	ASS3	21.8.21	1.00	Soil	x						
TP061	ASS4	21.8.21	1.50	Soil	x						
TP061	ASS5	21.8.21	2.00	Soil	x	1	1				
TP062	ASS1	21.8.21	0.00	Soil	x	1	1				
TP062	ASS2	21.8.21	0.50	Soil	x						
TP062	ASS3	21.8.21	1.00	Soil	x						
TP062	ASS4	21.8.21	1.50	Soil	x						
TP062	ASS5	21.8.21	2.00	Soil	x						
TP062	ASS6	21.8.21	2.50	Soil	x						
TP062	ASS7	21.8.21	3.00	Soil		1	1				
TP063	ASS1	21.8.21	0.00	Soil		1	1				
TP063	ASS2	21.8.21	0.50	Soil	x						
TP063	ASS3	21.8.21	1.00	Soil	x						
TP063	ASS4	21.8.21	1.50	Soil	x						
TP063	ASS5	21.8.21	2.00	Soil	x						
TP063	ASS6	21.8.21	2.50	Soil	x						
TP063	ASS7	21.8.21	2.70	Soil		1	1				
TP064	ASS1	21.8.21	0.00	Soil		1	1				
TP064	ASS2	21.8.21	0.50	Soil	x						
TP064	ASS3	21.8.21	1.00	Soil	x						
TP064	ASS4	21.8.21	1.50	Soil	x						
TP064	ASS5	21.8.21	2.00	Soil		1	1				
TP056	ASS1	21.8.21	0.00	Soil		1	1				
TP056	ASS2	21.8.21	0.50	Soil	x						
TP056	ASS3	21.8.21	1.00	Soil	x						
TP056	ASS4	21.8.21	1.50	Soil		1	1				
			TOTAL	0	0	14	14				

ADDITIONAL COMMENTS:

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	HOLD	pHf	pHfox				
TP071	ASS1	22.8.21	0.00	Soil		1	1				
TP071	ASS2	22.8.21	0.50	Soil	x						
TP071	ASS3	22.8.21	1.00	Soil	x						
TP071	ASS4	22.8.21	1.50	Soil	x						
TP071	ASS5	22.8.21	2.00	Soil	x						
TP071	ASS6	22.8.21	2.30	Soil		1	1				
TP072	ASS1	22.8.21	0.00	Soil		1	1				
TP072	ASS2	22.8.21	0.50	Soil	x						
TP072	ASS3	22.8.21	1.00	Soil	x						
TP072	ASS4	22.8.21	1.50	Soil	x						
TP072	ASS5	22.8.21	2.00	Soil	x						
TP072	ASS6	22.8.21	2.30	Soil		1	1				
TP073	ASS1	22.8.21	0.00	Soil		1	1				
TP073	ASS2	22.8.21	0.50	Soil	x						
TP073	ASS3	22.8.21	1.00	Soil	x						
TP073	ASS4	22.8.21	1.50	Soil	x						
TP073	ASS5	22.8.21	2.10	Soil		1	1				
TP065	ASS1	22.8.21	0.00	Soil		1	1				
TP065	ASS2	22.8.21	0.50	Soil	x						
TP065	ASS3	22.8.21	1.00	Soil	x						
TP065	ASS4	22.8.21	1.50	Soil	x						
TP065	ASS5	22.8.21	2.00	Soil	x						
TP065	ASS6	22.8.21	2.20	Soil		1	1				
TP066	ASS1	22.8.21	0.00	Soil		1	1				
TP066	ASS2	22.8.21	0.50	Soil	x						
TP066	ASS3	22.8.21	1.00	Soil	x						
TP066	ASS4	22.8.21	1.50	Soil	x						
TP066	ASS5	22.8.21	2.00	Soil	x						
TP066	ASS6	22.8.21	2.50	Soil	x						
TP066	ASS7	22.8.21	3.00	Soil	x	1	1				
TP067	ASS1	22.8.21	0.00	Soil	x	1	1				
TP067	ASS2	22.8.21	0.50	Soil	x						
TP067	ASS3	22.8.21	1.00	Soil	x						
TP067	ASS4	22.8.21	1.50	Soil	x						
TP067	ASS5	22.8.21	2.00	Soil		1	1				
			TOTAL	0	0	12	12				

ADDITIONAL COMMENTS:

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	HOLD	pHf	pHfox				
TP079	ASS1	23.8.21	0.00	Soil		1	1				
TP079	ASS2	23.8.21	0.50	Soil	x						
TP079	ASS3	23.8.21	1.00	Soil	x						
TP079	ASS4	23.8.21	1.50	Soil	x						
TP079	ASS5	23.8.21	2.00	Soil	x						
TP079	ASS6	23.8.21	2.30	Soil		1	1				
TP075	ASS1	23.8.21	0.00	Soil		1	1				
TP075	ASS2	23.8.21	0.50	Soil	x						
TP075	ASS3	23.8.21	1.00	Soil	x						
TP075	ASS4	23.8.21	1.50	Soil		1	1				
TP076	ASS1	23.8.21	0.00	Soil		1	1				
TP076	ASS2	23.8.21	0.50	Soil	x						
TP076	ASS3	23.8.21	1.00	Soil	x						
TP076	ASS4	23.8.21	1.50	Soil	x						
TP076	ASS5	23.8.21	2.00	Soil	x						
TP076	ASS6	23.8.21	2.40	Soil		1	1				
TP077	ASS1	23.8.21	0.00	Soil		1	1				
TP077	ASS2	23.8.21	0.50	Soil	x						
TP077	ASS3	23.8.21	1.00	Soil	x						
TP077	ASS4	23.8.21	1.50	Soil	x						
TP077	ASS5	23.8.21	2.00	Soil		1	1				
TP078	ASS1	23.8.21	0.00	Soil		1	1				
TP078	ASS2	23.8.21	0.50	Soil	x						
TP078	ASS3	23.8.21	1.00	Soil	x						
TP078	ASS4	23.8.21	1.50	Soil	x						
TP078	ASS5	23.8.21	2.00	Soil	x						
TP078	ASS6	23.8.21	2.50	Soil	x						
TP078	ASS7	23.8.21	3.00	Soil		1	1				
TP070	ASS1	23.8.21	0.00	Soil		1	1				
TP070	ASS2	23.8.21	0.50	Soil	x						
TP070	ASS3	23.8.21	1.00	Soil	x						
TP070	ASS4	23.8.21	1.50	Soil	x						
TP070	ASS5	23.8.21	2.00	Soil	x						
TP070	ASS6	23.8.21	2.50	Soil	x						
TP070	ASS7	23.8.21	3.00	Soil		1	1				
			TOTAL	0	0	12	12				

ADDITIONAL COMMENTS:

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	HOLD	pHf	pHfox				
TP074	ASS1	24.8.21	0.00	Soil		1	1				
TP074	ASS2	24.8.21	0.00	Soil	x						
TP074	ASS4	23.8.21	1.80	Soil		1	1				

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie
Date Samples Sent:
COC Checked by:

Location ID	Sample number	Date	Depth (m)	Matrix	HOLD	pHf	pHfox				
TP055	ASS1	25.8.21	0.00	Soil		1	1				
TP055	ASS2	25.8.21	0.00	Soil		1	1				
TP055	ASS4	25.8.21	1.50	Soil		1	1				
TP054	ASS1	25.8.21	0.00	Soil		1	1				
TP054	ASS2	25.8.21	2.10	Soil	Check this is present - possibly omiitted on field notes						
TP053	ASS1	25.8.21	2.00	Soil	x						
TP053	ASS2	25.8.21	2.30	Soil	x						
TP052	ASS1	25.8.21	0.00	Soil	x						
TP052	ASS2	25.8.21	2.40	Soil		1	1				
TP051	ASS1	25.8.21	0.00	Soil		1	1				
TP051	ASS2	25.8.21	0.00	Soil		1	1				
TP051	ASS4	25.8.21	3.00	Soil	x						
TP042	ASS1	25.8.21	0.00	Soil	x						
TP042	ASS2	25.8.21	2.20	Soil		1	1				
TP041	ASS1	25.8.21	0.00	Soil		1	1				
TP041	ASS2	25.8.21	3.00	Soil		1	1				
			TOTAL	**0**	**0**	**10**	**10**				

ADDITIONAL COMMENTS:

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

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.

Attention: **Karen Mackenzie**

Report **834932-S**
Project name W-AO
Received Date Oct 22, 2021

Client Sample ID			**ASS3_1.6_15.8.21_CPT037**	**ASS1_0.9_16.8.21_CPT040**	**ASS2_2.4_18.8.21_CPT047**	**ASS3_1.8_18.8.21_CPT047**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc52487**	**L21-Oc52488**	**L21-Oc52489**	**L21-Oc52490**
Date Sampled			**Aug 15, 2021**	**Aug 16, 2021**	**Aug 18, 2021**	**Aug 18, 2021**
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	29	27	42	30
>2mm Fraction	0.005	g	9.7	4.9	< 0.005	< 0.005
Analysed Material	0.1	%	75	85	100	100
Extraneous Material	0.1	%	25	15	< 0.1	< 0.1
Chromium Suite - NASSG (Excluding ANC)						
CRS suite - NASSG (Excluding ANC) - Liming Rate	1	kg CaCO3/t	32	15	14	71
CRS suite - NASSG (Excluding ANC) - Net Acidity (Acidity Units)	10	mol H+/t	420	200	190	950
CRS Suite - NASSG (Excluding ANC) - Net Acidity (Sulfur Units)	0.02	% S	0.68	0.32	0.31	1.5
pH-KCL	0.1	pH Units	8.9	9.2	9.1	8.6
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	< 0.003	< 0.003	< 0.003	< 0.003
Chromium Reducible Sulfur[S04]	0.005	% S	0.68	0.32	0.31	1.5
Chromium Reducible Sulfur -acidity units	3	mol H+/t	420	200	190	950
Sulfur - KCl Extractable	0.02	% S	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
HCl Extractable Sulfur	0.02	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur	0.02	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur - acidity units	10	mol H+/t	N/A	N/A	N/A	N/A
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	59	24	9.7	8.0
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	12000	4800	1900	1600
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	19	7.7	3.1	2.6
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10	< 10
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	< 1	< 1	< 1
% Moisture	1	%	15	29	30	40

Client Sample ID			ASS2_2_19.8.21_CPT049	ASS3_0.7_20.8.21_CPT052	ASS4_1.7_21.8.21_CPT055	ASS1_1.6_22.8.21_CPT057
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc52491**	**L21-Oc52492**	**L21-Oc52493**	**L21-Oc52494**
Date Sampled			**Aug 19, 2021**	**Aug 20, 2021**	**Aug 21, 2021**	**Aug 22, 2021**
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	30	48	33	52
>2mm Fraction	0.005	g	< 0.005	3.8	2.2	< 0.005
Analysed Material	0.1	%	100	93	94	100
Extraneous Material	0.1	%	< 0.1	7.3	6.2	< 0.1
Chromium Suite - NASSG (Excluding ANC)						
CRS suite - NASSG (Excluding ANC) - Liming Rate	1	kg CaCO3/t	< 1	52	100	59
CRS suite - NASSG (Excluding ANC) - Net Acidity (Acidity Units)	10	mol H+/t	12	690	1400	790
CRS Suite - NASSG (Excluding ANC) - Net Acidity (Sulfur Units)	0.02	% S	0.02	1.1	2.2	1.3
pH-KCL	0.1	pH Units	8.9	8.8	8.6	8.7
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	< 2	< 2	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	< 0.003	< 0.003	< 0.003	< 0.003
Chromium Reducible Sulfur[S04]	0.005	% S	0.019	1.1	2.2	1.3
Chromium Reducible Sulfur -acidity units	3	mol H+/t	12	690	1400	790
Sulfur - KCl Extractable	0.02	% S	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
HCl Extractable Sulfur	0.02	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur	0.02	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur - acidity units	10	mol H+/t	N/A	N/A	N/A	N/A
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	12	5.1	17	9.8
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	2400	1000	3500	2000
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	3.9	1.7	5.5	3.1
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	< 10	< 10	< 10
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	< 1	< 1	< 1
% Moisture	1	%	23	35	24	33

Client Sample ID			ASS3_1.4_22.8.21_CPT058
Sample Matrix			**Soil**
Eurofins Sample No.			**L21-Oc52495**
Date Sampled			**Aug 22, 2021**
Test/Reference	LOR	Unit	
Extraneous Material			
<2mm Fraction	0.005	g	39
>2mm Fraction	0.005	g	1.9
Analysed Material	0.1	%	95
Extraneous Material	0.1	%	4.7

Client Sample ID			ASS3_1.4_22.8.21_CPT058
Sample Matrix			**Soil**
Eurofins Sample No.			**L21-Oc52495**
Date Sampled			**Aug 22, 2021**
Test/Reference	LOR	Unit	
Chromium Suite - NASSG (Excluding ANC)			
CRS suite - NASSG (Excluding ANC) - Liming Rate	1	kg CaCO3/t	280
CRS suite - NASSG (Excluding ANC) - Net Acidity (Acidity Units)	10	mol H+/t	3800
CRS Suite - NASSG (Excluding ANC) - Net Acidity (Sulfur Units)	0.02	% S	6.0
pH-KCL	0.1	pH Units	8.0
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	< 0.003
Chromium Reducible Sulfur[S04]	0.005	% S	6.0
Chromium Reducible Sulfur -acidity units	3	mol H+/t	3800
Sulfur - KCl Extractable	0.02	% S	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0
HCl Extractable Sulfur	0.02	% S	N/A
Net Acid soluble sulfur	0.02	% S	N/A
Net Acid soluble sulfur - acidity units	10	mol H+/t	N/A
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	N/A
Acid Neutralising Capacity (ANCbt)	0.01	% CaCO3	10
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	2000
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	3.2
ANC Fineness Factor		factor	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	3.9
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	2400
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	180
% Moisture	1	%	38

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Extraneous Material	Brisbane	Oct 25, 2021	6 Week
- Method: LTM-GEN-7050/7070			
Chromium Suite - NASSG (Excluding ANC)	Brisbane	Oct 25, 2021	6 Week
- Method: LTM-GEN-7070 Chromium Reducible Sulfur Suite			
% Moisture	Welshpool	Oct 25, 2021	14 Days
- Method: ARL135 Moisture in Solids			

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Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name: W-AO

Order No.:
Report #: 834932
Phone: 08 8271 5255
Fax:

Received: Oct 22, 2021 10:43 AM
Due: Oct 29, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Moisture Set	Chromium Suite - NASSG (Excluding ANC)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	ASS3_1.6_15.8.21_CPT037	Aug 15, 2021		Soil	L21-Oc52487	X	X
2	ASS1_0.9_16.8.21_CPT040	Aug 16, 2021		Soil	L21-Oc52488	X	X
3	ASS2_2.4_18.8.21_CPT047	Aug 18, 2021		Soil	L21-Oc52489	X	X
4	ASS3_1.8_18.8.21_CPT047	Aug 18, 2021		Soil	L21-Oc52490	X	X
5	ASS2_2_19.8.21_CPT049	Aug 19, 2021		Soil	L21-Oc52491	X	X
6	ASS3_0.7_20.8.21_CPT052	Aug 20, 2021		Soil	L21-Oc52492	X	X

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Company Name: LWC Management Pty Ltd
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WA 6000

Project Name: W-AO

Order No.:
Report #: 834932
Phone: 08 8271 5255
Fax:

Received: Oct 22, 2021 10:43 AM
Due: Oct 29, 2021
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Moisture Set	Chromium Suite - NASSG (Excluding ANC)
Perth Laboratory - NATA # 2377 Site # 2370						X	
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							X
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
7	ASS4_1.7_21.8.21_CPT055	Aug 21, 2021		Soil	L21-Oc52493	X	X
8	ASS1_1.6_22.8.21_CPT057	Aug 22, 2021		Soil	L21-Oc52494	X	X
9	ASS3_1.4_22.8.21_CPT058	Aug 22, 2021		Soil	L21-Oc52495	X	X
Test Counts						9	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Chromium Suite - NASSG (Excluding ANC)							
pH-KCL	%	100			80-120	Pass	
Acid trail - Titratable Actual Acidity	%	100			80-120	Pass	
Chromium Reducible Sulfur	%	96			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Chromium Suite - NASSG (Excluding ANC)				Result 1	Result 2	RPD			
CRS suite - NASSG (Excluding ANC) - Liming Rate	L21-Oc52491	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
CRS suite - NASSG (Excluding ANC) - Net Acidity (Acidity Units)	L21-Oc52491	CP	mol H+/t	12	12	<1	30%	Pass	
CRS Suite - NASSG (Excluding ANC) - Net Acidity (Sulfur Units)	L21-Oc52491	CP	% S	0.02	0.02	<1	30%	Pass	
pH-KCL	L21-Oc52491	CP	pH Units	8.9	8.9	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	L21-Oc52491	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	L21-Oc52491	CP	% pyrite S	< 0.003	< 0.003	<1	30%	Pass	
Chromium Reducible Sulfur	L21-Oc52491	CP	% S	0.019	0.019	<1	30%	Pass	
Chromium Reducible Sulfur -acidity units	L21-Oc52491	CP	mol H+/t	12	12	<1	30%	Pass	
Sulfur - KCl Extractable	L21-Oc52491	CP	% S	N/A	N/A	N/A	30%	Pass	
HCl Extractable Sulfur	L21-Oc52491	CP	% S	N/A	N/A	N/A	30%	Pass	
Net Acid soluble sulfur	L21-Oc52491	CP	% S	N/A	N/A	N/A	30%	Pass	
Net Acid soluble sulfur - acidity units	L21-Oc52491	CP	mol H+/t	N/A	N/A	N/A	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	L21-Oc52491	CP	% S	N/A	N/A	N/A	30%	Pass	
Acid Neutralising Capacity (ANCbt)	L21-Oc52491	CP	% CaCO3	12	12	1.0	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	L21-Oc52491	CP	% S	3.9	4.0	1.0	30%	Pass	
ANC Fineness Factor	L21-Oc52491	CP	factor	1.5	1.5	<1	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	L21-Oc52491	CP	% S	< 0.02	< 0.02	<1	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	L21-Oc52491	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
CRS Suite - Liming Rate	L21-Oc52491	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L21-Oc52493	CP	%	24	24	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl if greater than or equal to pH 6.5
S04	Acid Sulfate Soil Samples have a 24 hour holding time unless frozen or dried within that period

Authorised by:

Robert Johnston	Analytical Services Manager
Myles Clark	Senior Analyst-SPOCAS (QLD)



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Karen Mackenzie
Project name:	W-AO
Project ID:	Not provided
Turnaround time:	5 Day
Date/Time received	Oct 22, 2021 10:43 AM
Eurofins reference	834932

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Robert Johnston on phone : or by email: RobertJohnston@eurofins.com

Results will be delivered electronically via email to Karen Mackenzie - kmackenzie@lwconsulting.com.au.

Global Leader - Results you can trust

Robert Johnston

From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Friday, 22 October 2021 10:43
To: Robert Johnston; Rhys Thomas
Cc: Riley Martin
Subject: Re-batch for CRS suite
Attachments: 820498-S_report.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL*

Dear All,

Please can we have the following samples analysed for the chromium reducible sulfur suite

ASS3_1.6_15.8.21_CPT037	CPT037	1.60	1.60
ASS1_0.9_16.8.21_CPT040	CPT040	0.90	0.90
ASS2_2.4_18.8.21_CPT047	CPT047	2.40	2.40
ASS3_1.8_18.8.21_CPT047	CPT047	1.80	1.80
ASS2_2_19.8.21_CPT049	CPT049	2.00	2.00
ASS3_0.7_20.8.21_CPT052	CPT052	0.70	0.70
ASS4_1.7_21.8.21_CPT055	CPT055	1.70	1.70
ASS1_1.6_22.8.21_CPT057	CPT057	1.6	1.6
ASS3_1.4_22.8.21_CPT058	CPT058	1.4	1.4

I've attached the original results,

Thanks

Karen

Dr Karen Mackenzie | Principal Geochemist

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Rob Johnston Eurofins 22/10/21

834932

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NATA Accredited
Accreditation Number 2377
Site Number 2370

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.

Attention: **Vanessa Dechellis**

Report **849207-S**
Project name W-AO
Received Date Dec 10, 2021

Client Sample ID			**TP27**	**TP39**	**TP50**	**TP58**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-De25970**	**L21-De25971**	**L21-De25972**	**L21-De25973**
Date Sampled			**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	120	< 5	100	330
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	520	1700	89	220
Nitrate & Nitrite (as N)	5	mg/kg	< 5	18	7.0	39
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.8	9.2	9.2	7.5
Resistivity*	0.5	ohm.m	19	5.8	110	46
Sulphate (as SO4)	30	mg/kg	< 30	< 30	< 30	< 30
Total Kjeldahl Nitrogen (as N)	10	mg/kg	240	300	600	1000
Total Nitrogen (as N)*	10	mg/kg	240	318	607	1039
Total Organic Carbon	0.1	%	0.5	0.9	3.1	1.9
Phosphorus	5	mg/kg	110	150	220	300
% Moisture	1	%	5.7	2.2	4.4	10
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	36	28	35	29

Client Sample ID			**TP65**	**TP71**	**TP81**	**TP115**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-De25974**	**L21-De25975**	**L21-De25976**	**L21-De25977**
Date Sampled			**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	2200	1200	< 5	28
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	1000	790	44	51
Nitrate & Nitrite (as N)	5	mg/kg	< 5	7.0	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	9.3	8.6	7.8	8.3
Resistivity*	0.5	ohm.m	9.8	13	230	200
Sulphate (as SO4)	30	mg/kg	250	< 30	< 30	< 30
Total Kjeldahl Nitrogen (as N)	10	mg/kg	580	350	710	400
Total Nitrogen (as N)*	10	mg/kg	580	357	710	400
Total Organic Carbon	0.1	%	1.1	0.7	1.4	0.5
Phosphorus	5	mg/kg	150	160	240	140
% Moisture	1	%	7.7	5.3	3.8	4.2
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	41	41	31	21

Client Sample ID			TP133	TP151	TP165	TP179
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-De25978	L21-De25979	L21-De25980	L21-De25981
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	52	94	59	< 5
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	300	84	140	56
Nitrate & Nitrite (as N)	5	mg/kg	< 5	9.6	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.9	8.6	8.5	8.6
Resistivity*	0.5	ohm.m	34	120	71	180
Sulphate (as SO4)	30	mg/kg	120	< 30	< 30	< 30
Total Kjeldahl Nitrogen (as N)	10	mg/kg	210	600	470	430
Total Nitrogen (as N)*	10	mg/kg	210	609.6	470	430
Total Organic Carbon	0.1	%	0.7	5.6	< 0.1	0.3
Phosphorus	5	mg/kg	160	170	140	130
% Moisture	1	%	6.5	4.7	6.3	3.6
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	62	42	41	40

Client Sample ID			TP181	TP206	TP211	TP213
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-De25982	L21-De25983	L21-De25984	L21-De25985
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	20	28	26	2400
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	130	240	140	1500
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	24
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	9.2	8.3	8.3	8.7
Resistivity*	0.5	ohm.m	75	42	74	6.7
Sulphate (as SO4)	30	mg/kg	< 30	270	380	1800
Total Kjeldahl Nitrogen (as N)	10	mg/kg	360	370	20	150
Total Nitrogen (as N)*	10	mg/kg	360	370	20	174
Total Organic Carbon	0.1	%	3.9	0.9	0.7	2.9
Phosphorus	5	mg/kg	150	170	160	220
% Moisture	1	%	7.2	4.3	7.8	19
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	43	54	56	34

Client Sample ID			SSA5	SSA6	SSA11	SSA15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-De25986	L21-De25987	L21-De25988	L21-De25989
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	11000	18000	35000	15
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	3600	7800	13000	15000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.2	8.7	8.3	8.6
Resistivity*	0.5	ohm.m	2.8	1.3	0.8	0.7
Sulphate (as SO4)	30	mg/kg	2000	2500	3900	68

Client Sample ID			SSA5	SSA6	SSA11	SSA15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-De25986	L21-De25987	L21-De25988	L21-De25989
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Total Kjeldahl Nitrogen (as N)	10	mg/kg	160	220	89	92
Total Nitrogen (as N)*	10	mg/kg	160	220	89	92
Total Organic Carbon	0.1	%	< 0.1	0.5	0.6	4.2
Phosphorus	5	mg/kg	140	210	140	240
% Moisture	1	%	22	28	24	23
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	13	39	34	69

Client Sample ID			SSA16	SSA17	SSA21	SSA22
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-De25990	L21-De25991	L21-De25992	L21-De25993
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	36000	3700	4100	7900
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	13000	11000	9900	3500
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.7	9.0	8.4	8.3
Resistivity*	0.5	ohm.m	0.8	0.9	1.0	2.9
Sulphate (as SO4)	30	mg/kg	6700	470	600	1500
Total Kjeldahl Nitrogen (as N)	10	mg/kg	42	33	97	450
Total Nitrogen (as N)*	10	mg/kg	42	33	97	450
Total Organic Carbon	0.1	%	0.2	< 0.1	0.6	1.3
Phosphorus	5	mg/kg	100	160	210	200
% Moisture	1	%	14	13	24	23
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	35	35	13	29

Client Sample ID			SSA54	SSA57	SSA77	SSA84
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-De25994	L21-De25995	L21-De25996	L21-De25997
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	6700	50000	44000	50000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	14000	16000	13000	15000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.5	8.4	8.0	8.6
Resistivity*	0.5	ohm.m	0.7	0.6	0.8	0.7
Sulphate (as SO4)	30	mg/kg	810	4500	4800	7200
Total Kjeldahl Nitrogen (as N)	10	mg/kg	110	230	150	210
Total Nitrogen (as N)*	10	mg/kg	110	230	150	210
Total Organic Carbon	0.1	%	1.3	1.2	0.4	1.5
Phosphorus	5	mg/kg	180	290	220	270
% Moisture	1	%	25	26	20	25
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	39	39	21	38

Client Sample ID			SSA98	SSA107	SSA114
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-De25998**	**L21-De25999**	**L21-De26000**
Date Sampled			**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]
Test/Reference	LOR	Unit			
Chloride	5	mg/kg	1600	40000	260
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	4000	17000	16000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.8	8.5	8.3
Resistivity*	0.5	ohm.m	2.5	0.6	0.6
Sulphate (as SO4)	30	mg/kg	330	3100	150
Total Kjeldahl Nitrogen (as N)	10	mg/kg	100	170	310
Total Nitrogen (as N)*	10	mg/kg	100	170	310
Total Organic Carbon	0.1	%	3.0	1.3	0.2
Phosphorus	5	mg/kg	77	250	230
% Moisture	1	%	5.8	25	35
Cation Exchange Capacity					
Cation Exchange Capacity	0.05	meq/100g	25	81	34

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Melbourne	Dec 15, 2021	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Dec 15, 2021	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Sulphate (as SO4)	Melbourne	Dec 15, 2021	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Dec 15, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Dec 20, 2021	28 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Dec 15, 2021	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Dec 15, 2021	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
Total Organic Carbon	Melbourne	Dec 20, 2021	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphorus	Melbourne	Dec 15, 2021	180 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
% Moisture	Melbourne	Dec 10, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name: W-AO

Order No.:
Report #: 849207
Phone: 08 8271 5255
Fax:

Received: Dec 10, 2021 1:26 PM
Due: Dec 17, 2021
Priority: 5 Day
Contact Name: Vanessa Dechellis

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Total Organic Carbon	Aggressivity Soil Set	Moisture Set	Cation Exchange Capacity	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Perth Laboratory - NATA # 2377 Site # 2370										
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217										
Brisbane Laboratory - NATA # 1261 Site # 20794										
Mayfield Laboratory - NATA # 1261 Site # 25079										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	TP27	Not Provided		Soil	L21-De25970	X	X	X	X	X
2	TP39	Not Provided		Soil	L21-De25971	X	X	X	X	X
3	TP50	Not Provided		Soil	L21-De25972	X	X	X	X	X
4	TP58	Not Provided		Soil	L21-De25973	X	X	X	X	X
5	TP65	Not Provided		Soil	L21-De25974	X	X	X	X	X
6	TP71	Not Provided		Soil	L21-De25975	X	X	X	X	X
7	TP81	Not Provided		Soil	L21-De25976	X	X	X	X	X
8	TP115	Not Provided		Soil	L21-De25977	X	X	X	X	X
9	TP133	Not Provided		Soil	L21-De25978	X	X	X	X	X
10	TP151	Not Provided		Soil	L21-De25979	X	X	X	X	X

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Company Name: LWC Management Pty Ltd
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Project Name: W-AO

Order No.:
Report #: 849207
Phone: 08 8271 5255
Fax:

Received: Dec 10, 2021 1:26 PM
Due: Dec 17, 2021
Priority: 5 Day
Contact Name: Vanessa Dechellis

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Total Organic Carbon	Aggressivity Soil Set	Moisture Set	Cation Exchange Capacity	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Perth Laboratory - NATA # 2377 Site # 2370										
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217										
Brisbane Laboratory - NATA # 1261 Site # 20794										
Mayfield Laboratory - NATA # 1261 Site # 25079										
External Laboratory										
11	TP165	Not Provided		Soil	L21-De25980	X	X	X	X	X
12	TP179	Not Provided		Soil	L21-De25981	X	X	X	X	X
13	TP181	Not Provided		Soil	L21-De25982	X	X	X	X	X
14	TP206	Not Provided		Soil	L21-De25983	X	X	X	X	X
15	TP211	Not Provided		Soil	L21-De25984	X	X	X	X	X
16	TP213	Not Provided		Soil	L21-De25985	X	X	X	X	X
17	SSA5	Not Provided		Soil	L21-De25986	X	X	X	X	X
18	SSA6	Not Provided		Soil	L21-De25987	X	X	X	X	X
19	SSA11	Not Provided		Soil	L21-De25988	X	X	X	X	X
20	SSA15	Not Provided		Soil	L21-De25989	X	X	X	X	X
21	SSA16	Not Provided		Soil	L21-De25990	X	X	X	X	X

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NATA # 1261 Site # 25079

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Perth
WA 6000

Project Name: W-AO

Order No.:
Report #: 849207
Phone: 08 8271 5255
Fax:

Received: Dec 10, 2021 1:26 PM
Due: Dec 17, 2021
Priority: 5 Day
Contact Name: Vanessa Dechellis

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Total Organic Carbon	Aggressivity Soil Set	Moisture Set	Cation Exchange Capacity	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Perth Laboratory - NATA # 2377 Site # 2370										
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217										
Brisbane Laboratory - NATA # 1261 Site # 20794										
Mayfield Laboratory - NATA # 1261 Site # 25079										
External Laboratory										
22	SSA17	Not Provided		Soil	L21-De25991	X	X	X	X	X
23	SSA21	Not Provided		Soil	L21-De25992	X	X	X	X	X
24	SSA22	Not Provided		Soil	L21-De25993	X	X	X	X	X
25	SSA54	Not Provided		Soil	L21-De25994	X	X	X	X	X
26	SSA57	Not Provided		Soil	L21-De25995	X	X	X	X	X
27	SSA77	Not Provided		Soil	L21-De25996	X	X	X	X	X
28	SSA84	Not Provided		Soil	L21-De25997	X	X	X	X	X
29	SSA98	Not Provided		Soil	L21-De25998	X	X	X	X	X
30	SSA107	Not Provided		Soil	L21-De25999	X	X	X	X	X
31	SSA114	Not Provided		Soil	L21-De26000	X	X	X	X	X
Test Counts						31	31	31	31	31

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.4
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 5			5	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/kg	< 5			5	Pass	
Sulphate (as SO4)	mg/kg	< 30			30	Pass	
Total Kjeldahl Nitrogen (as N)	mg/kg	< 10			10	Pass	
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Chloride	%	107			70-130	Pass	
Nitrate & Nitrite (as N)	%	100			70-130	Pass	
Sulphate (as SO4)	%	95			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	106			70-130	Pass	
Total Organic Carbon	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Total Kjeldahl Nitrogen (as N)	L21-De25981	CP	%	126			70-130	Pass	
Spike - % Recovery									
				Result 1					
Sulphate (as SO4)	L21-De25991	CP	%	46			70-130	Fail	Q08

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De25970	CP	uS/cm	520	550	5.5	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De25970	CP	pH Units	8.8	8.8	pass	30%	Pass	
Resistivity*	L21-De25970	CP	ohm.m	19	18	5.5	30%	Pass	
Phosphorus	L21-De25970	CP	mg/kg	110	110	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De25973	CP	uS/cm	220	260	16	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De25973	CP	pH Units	7.5	7.4	pass	30%	Pass	
Resistivity*	L21-De25973	CP	ohm.m	46	39	16	30%	Pass	
Total Kjeldahl Nitrogen (as N)	L21-De25973	CP	mg/kg	1000	800	23	30%	Pass	
Phosphorus	L21-De25973	CP	mg/kg	300	220	29	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De25974	CP	uS/cm	1000	1100	5.6	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De25974	CP	pH Units	9.3	9.4	pass	30%	Pass	
Resistivity*	L21-De25974	CP	ohm.m	9.8	9.3	5.6	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De25975	CP	uS/cm	790	810	1.6	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De25975	CP	pH Units	8.6	8.7	pass	30%	Pass	
Resistivity*	L21-De25975	CP	ohm.m	13	12	1.6	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L21-De25977	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De25978	CP	uS/cm	300	340	14	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De25978	CP	pH Units	8.9	9.0	pass	30%	Pass	
Resistivity*	L21-De25978	CP	ohm.m	34	29	14	30%	Pass	
Total Organic Carbon	L21-De25978	CP	%	0.7	1.1	42	30%	Fail	Q15
Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	L21-De25978	CP	meq/100g	62	65	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De25980	CP	uS/cm	140	150	3.4	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De25980	CP	pH Units	8.5	8.5	pass	30%	Pass	
Resistivity*	L21-De25980	CP	ohm.m	71	69	3.4	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L21-De25983	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L21-De25986	CP	mg/kg	11000	11000	2.0	30%	Pass	
Sulphate (as SO4)	L21-De25986	CP	mg/kg	2000	2000	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De25990	CP	uS/cm	13000	13000	2.5	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De25990	CP	pH Units	8.7	8.8	pass	30%	Pass	
Resistivity*	L21-De25990	CP	ohm.m	0.8	0.8	2.5	30%	Pass	
Phosphorus	L21-De25990	CP	mg/kg	100	91	14	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L21-De25992	CP	mg/kg	4100	4000	2.5	30%	Pass	
Sulphate (as SO4)	L21-De25992	CP	mg/kg	600	600	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De25993	CP	uS/cm	3500	3500	<1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De25993	CP	pH Units	8.3	8.3	pass	30%	Pass	
Resistivity*	L21-De25993	CP	ohm.m	2.9	2.9	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L21-De25994	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Sulphate (as SO4)	L21-De25994	CP	mg/kg	810	880	9.0	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	L21-De25996	CP	%	0.4	0.5	20	30%	Pass	
% Moisture	L21-De25996	CP	%	20	20	2.0	30%	Pass	
Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	L21-De25997	CP	meq/100g	38	37	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L21-De25998	CP	mg/kg	1600	1400	12	30%	Pass	
Sulphate (as SO4)	L21-De25998	CP	mg/kg	330	340	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	N/A
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
I12	Where sampling date has not been provided, Eurofins | Environment Testing is not able to determine whether analysis has been performed within recommended holding times.
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Rhys Thomas	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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eurofins | ARL

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Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Vanessa Dechellis
Project name:	W-AO
Project ID:	Not provided
Turnaround time:	5 Day
Date/Time received	Dec 10, 2021 1:26 PM
Eurofins reference	849207

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✗	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

SSA58 has insufficient sample to be analysed

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Robert Johnston on phone : or by email: RobertJohnston@eurofins.com

Results will be delivered electronically via email to Vanessa Dechellis - vdechellis@lwconsulting.com.au.

Global Leader - Results you can trust

Robert Johnston

From: Vanessa Dechellis <vdechellis@lwconsulting.com.au>
Sent: Friday, 10 December 2021 13:26
To: Robert Johnston
Subject: RE: Re-Batch request - samples not on COC

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL*

Hi Rob,

Thanks for the below. I will follow this up. They must not have done these in the field... sigh.

Can you please schedule the ones that you do have and then I will select the remaining ones on Monday and update.

Thanks,

Vanessa

From: Robert Johnston <RobertJohnston@eurofins.com>
Sent: Friday, 10 December 2021 3:48 PM
To: Vanessa Dechellis <vdechellis@lwconsulting.com.au>
Subject: RE: Re-Batch request - samples not on COC

Hi Vanessa,

It's been a bit of a mission, but I have been able to locate the samples we do have from the list provided. In saying that, there are a sizeable number of samples that are not on the jobs received, so I was wondering if you could provide feedback on the below missing IDs?
TP34
TP106
TP110
TP119

SSA3
SSA8
SSA19
SSA20
SSA30
SSA48
SSA52
SSA55
SSA60
SSA63
SSA70
SSA71
SSA121

Rob Johnston 10/12/21 Eurofin

849207

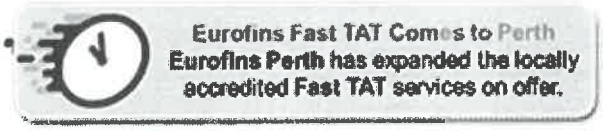
Might be easier to talk on the phone, but I don't have your number sorry. I will register these once we've had the chance to discuss.

Kind Regards,

Robert Johnston
Projects Lead, WA

Eurofins | ARL
46-48 Banksia Road
WELSHPOOL WA 6106
Australia

Phone: +61 (0)8 6253 4444
Mobile: +61 (0)4 2357 9286



Eurofins acquires ARL Group

From: Vanessa Dechellis <vdechellis@lwconsulting.com.au>
Sent: Tuesday, 7 December 2021 5:00
To: Robert Johnston <RobertJohnston@eurofins.com>
Subject: Re: Re-Batch request - samples not on COC

EXTERNAL EMAIL*

Hi Rob,

How did you go with this - manage to find all of the samples?

Thanks,

Vanessa

On 2 Dec 2021, at 5:31 pm, Robert Johnston <RobertJohnston@eurofins.com> wrote:

Hi Vanessa,

No problem. We will handle this accordingly. I'll let you know if any issues.

Kind Regards,

Robert Johnston
Projects Lead, WA

Eurofins | Environment Testing
46-48 Banksia Road
WELSHPOOL WA 6106

Rob Johnston 10/12/21 Eurofins 849207

Australia

Phone: +61 (0)8 9251 9605
Mobile: +61 (0)4 2357 9286
<image001.png>

Eurofins acquires ARL Group

From: Vanessa Dechellis <vdechellis@lwconsulting.com.au>
Sent: Thursday, 2 December 2021 12:19
To: Robert Johnston <RobertJohnston@eurofins.com>
Subject: Re-Batch request - samples not on COC

EXTERNAL EMAIL*

Hi Robert,

I am trying to organise a re-batch of some samples which were sent to you earlier this year (around September). Attached are the work orders that I can find on the folder but there may be others (this was managed by a subcontractor). Our job references is W-AO.

I would like to organise for the following samples to be submitted for analysis of *General Soil Parameters* as per the attached lab quote:

- Test Pits (all at depth 0)
  - TP27
  - TP34
  - TP39
  - TP50
  - TP58
  - TP65
  - TP71
  - TP81
  - TP106
  - TP110
  - TP 115
  - TP 119
  - TP 133
  - TP 151
  - TP 165
  - TP 179
  - TP 181
  - TP 206
  - TP 211
  - TP 213
- SSA Samples
  - SSA3
  - SSA 5
  - SSA 6
  - SSA 8
  - SSA 11
  - SSA 15
  - SSA 16

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- SSA 17
- SSA 19
- SSA 20
- SSA 21
- SSA 22
- SSA 30
- SSA 48
- SSA 52
- SSA 54
- SSA 55
- SSA 57
- SSA 58
- SSA 60
- SSA 63
- SSA 68
- SSA 70
- SSA 71
- SSA 77
- SSA 84
- SSA 98
- SSA 107
- SSA 114
- SSA 121

Can you please let me know if there are any samples that you do not have at the labs? For those, I will nominate alternative samples...

Kind regards,

Vanessa

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Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

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.

Attention: **Vanessa Dechellis**

Report **852134-S**
Project name W-AO
Received Date Dec 14, 2021

Client Sample ID			**TP37**	**TP148**	**TP135**	**TP137**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-De50280**	**L21-De50281**	**L21-De50282**	**L21-De50283**
Date Sampled			**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	2700	18	9.4	120
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	1500	130	140	170
Nitrate & Nitrite (as N)	5	mg/kg	9.5	< 5	14	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	9.0	8.4	8.6	7.2
Resistivity*	0.5	ohm.m	6.8	76	73	59
Sulphate (as SO4)	30	mg/kg	130	< 30	< 30	66
Total Kjeldahl Nitrogen (as N)	10	mg/kg	370	580	440	830
Total Nitrogen (as N)*	10	mg/kg	379.5	580	454	830
Total Organic Carbon	0.1	%	0.4	0.9	0.7	3.3
Phosphorus	5	mg/kg	< 5	< 5	< 5	18
% Moisture	1	%	5.0	5.3	4.9	2.4
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	28	31	34	38

Client Sample ID			**SSA001**	**SSA002**	**SSA026**	**SSA050**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L21-De50284**	**L21-De50285**	**L21-De50286**	**L21-De50287**
Date Sampled			**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]	**Not Provided**[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	37000	34000	29000	25000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	15000	15000	12000	10000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	6.5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.4	8.5	8.5	8.7
Resistivity*	0.5	ohm.m	0.7	0.7	0.9	1.0
Sulphate (as SO4)	30	mg/kg	5600	3300	3300	3000
Total Kjeldahl Nitrogen (as N)	10	mg/kg	950	240	320	370
Total Nitrogen (as N)*	10	mg/kg	950	246.5	320	370
Total Organic Carbon	0.1	%	1.2	0.8	0.7	0.3
Phosphorus	5	mg/kg	39	42	52	20
% Moisture	1	%	24	23	27	32
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	37	36	34	39

Client Sample ID			SSA051	SSA061	SSA062	SSA068
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-De50288	L21-De50289	L21-De50290	L21-De50291
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	18000	30000	46000	320
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	14000	13000	17000	750
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.4	8.4	8.5	9.0
Resistivity*	0.5	ohm.m	0.7	0.8	0.6	13
Sulphate (as SO4)	30	mg/kg	2100	3100	6500	920
Total Kjeldahl Nitrogen (as N)	10	mg/kg	35	320	300	250
Total Nitrogen (as N)*	10	mg/kg	35	320	300	250
Total Organic Carbon	0.1	%	< 0.1	1.6	1.9	0.3
Phosphorus	5	mg/kg	< 5	9.8	31	16
% Moisture	1	%	15	24	26	2.1
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	31	34	46	30

Client Sample ID			SSA073	SSA101	SSA102	SSA117
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L21-De50292	L21-De50293	L21-De50294	L21-De50295
Date Sampled			Not Provided[I12]	Not Provided[I12]	Not Provided[I12]	Not Provided[I12]
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	19000	24000	29000	16000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	10000	13000	13000	7900
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.6	8.4	8.4	8.7
Resistivity*	0.5	ohm.m	1.0	0.8	0.8	1.3
Sulphate (as SO4)	30	mg/kg	1400	6800	5900	2100
Total Kjeldahl Nitrogen (as N)	10	mg/kg	100	130	110	170
Total Nitrogen (as N)*	10	mg/kg	100	130	110	170
Total Organic Carbon	0.1	%	< 0.1	< 0.1	0.3	1.3
Phosphorus	5	mg/kg	22	19	< 5	9.3
% Moisture	1	%	11	16	21	19
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	23	43	40	28

Client Sample ID			SSA023
Sample Matrix			Soil
Eurofins Sample No.			L21-De50296
Date Sampled			Not Provided[I12]
Test/Reference	LOR	Unit	
Chloride	5	mg/kg	8000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	4300
Nitrate & Nitrite (as N)	5	mg/kg	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.3
Resistivity*	0.5	ohm.m	2.3
Sulphate (as SO4)	30	mg/kg	1000

Client Sample ID			SSA023
Sample Matrix			**Soil**
Eurofins Sample No.			**L21-De50296**
Date Sampled			**Not Provided**[I12]
Test/Reference	LOR	Unit	
Total Kjeldahl Nitrogen (as N)	10	mg/kg	150
Total Nitrogen (as N)*	10	mg/kg	150
Total Organic Carbon	0.1	%	< 0.1
Phosphorus	5	mg/kg	20
% Moisture	1	%	17
Cation Exchange Capacity			
Cation Exchange Capacity	0.05	meq/100g	24

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Melbourne	Dec 30, 2021	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Dec 30, 2021	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Sulphate (as SO4)	Melbourne	Dec 30, 2021	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Dec 30, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Dec 31, 2021	28 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Dec 30, 2021	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Dec 30, 2021	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
Total Organic Carbon	Melbourne	Dec 31, 2021	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphorus	Melbourne	Dec 30, 2021	180 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
% Moisture	Melbourne	Dec 21, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 1254

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name: W-AO

Order No.:
Report #: 852134
Phone: 08 8271 5255
Fax:

Received: Dec 14, 2021 12:07 PM
Due: Dec 30, 2021
Priority: 10 Day
Contact Name: Vanessa Dechellis

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Total Organic Carbon	Aggressivity Soil Set	Moisture Set	Cation Exchange Capacity	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Perth Laboratory - NATA # 2377 Site # 2370										
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217										
Brisbane Laboratory - NATA # 1261 Site # 20794										
Mayfield Laboratory - NATA # 1261 Site # 25079										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	TP37	Not Provided		Soil	L21-De50280	X	X	X	X	X
2	TP148	Not Provided		Soil	L21-De50281	X	X	X	X	X
3	TP135	Not Provided		Soil	L21-De50282	X	X	X	X	X
4	TP137	Not Provided		Soil	L21-De50283	X	X	X	X	X
5	SSA001	Not Provided		Soil	L21-De50284	X	X	X	X	X
6	SSA002	Not Provided		Soil	L21-De50285	X	X	X	X	X
7	SSA026	Not Provided		Soil	L21-De50286	X	X	X	X	X
8	SSA050	Not Provided		Soil	L21-De50287	X	X	X	X	X
9	SSA051	Not Provided		Soil	L21-De50288	X	X	X	X	X
10	SSA061	Not Provided		Soil	L21-De50289	X	X	X	X	X

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Murarrie QLD 4172
Phone : +61 7 3902 4600
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IANZ # 1327

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Phone : 0800 856 450
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Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
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WA 6000

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Received: Dec 14, 2021 12:07 PM
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Contact Name: Vanessa Dechellis

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Total Organic Carbon	Aggressivity Soil Set	Moisture Set	Cation Exchange Capacity	Eurofins Suite B19A: Total N (TKN, NOx), Total P
Perth Laboratory - NATA # 2377 Site # 2370										
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217										
Brisbane Laboratory - NATA # 1261 Site # 20794										
Mayfield Laboratory - NATA # 1261 Site # 25079										
External Laboratory										
11	SSA062	Not Provided		Soil	L21-De50290	X	X	X	X	X
12	SSA068	Not Provided		Soil	L21-De50291	X	X	X	X	X
13	SSA073	Not Provided		Soil	L21-De50292	X	X	X	X	X
14	SSA101	Not Provided		Soil	L21-De50293	X	X	X	X	X
15	SSA102	Not Provided		Soil	L21-De50294	X	X	X	X	X
16	SSA117	Not Provided		Soil	L21-De50295	X	X	X	X	X
17	SSA023	Not Provided		Soil	L21-De50296	X	X	X	X	X
Test Counts						17	17	17	17	17

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.4
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 5			5	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/kg	< 5			5	Pass	
Sulphate (as SO4)	mg/kg	< 30			30	Pass	
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Chloride	%	105			70-130	Pass	
Nitrate & Nitrite (as N)	%	100			70-130	Pass	
Sulphate (as SO4)	%	95			70-130	Pass	
Total Organic Carbon	%	127			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Total Kjeldahl Nitrogen (as N)	L21-De50289	CP	%	69			70-130	Fail	Q08

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	M21-De51388	NCP	%	83	81	3.2	30%	Pass	
% Moisture	L21-De50280	CP	%	5.0	4.5	10	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De50282	CP	uS/cm	140	140	3.6	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De50282	CP	pH Units	8.6	8.5	pass	30%	Pass	
Resistivity*	L21-De50282	CP	ohm.m	73	70	3.6	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L21-De50283	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De50285	CP	uS/cm	15000	15000	1.1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De50285	CP	pH Units	8.5	8.5	pass	30%	Pass	
Resistivity*	L21-De50285	CP	ohm.m	0.7	0.7	1.1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L21-De50287	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Phosphorus	L21-De50287	CP	mg/kg	20	39	65	30%	Fail	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De50288	CP	uS/cm	14000	14000	1.0	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De50288	CP	pH Units	8.4	8.4	pass	30%	Pass	
Resistivity*	L21-De50288	CP	ohm.m	0.7	0.7	1.0	30%	Pass	
Sulphate (as SO4)	L21-De50288	CP	mg/kg	2100	2700	23	30%	Pass	
Total Kjeldahl Nitrogen (as N)	L21-De50288	CP	mg/kg	35	34	4.6	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Chloride	L21-De50289	CP	mg/kg	30000	34000	14	30%	Pass	
Sulphate (as SO4)	L21-De50289	CP	mg/kg	3100	3300	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L21-De50290	CP	uS/cm	17000	17000	<1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L21-De50290	CP	pH Units	8.5	8.5	pass	30%	Pass	
Resistivity*	L21-De50290	CP	ohm.m	0.6	0.6	<1	30%	Pass	
% Moisture	L21-De50290	CP	%	26	26	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L21-De50296	CP	mg/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	N/A
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
I12	Where sampling date has not been provided, Eurofins | Environment Testing is not able to determine whether analysis has been performed within recommended holding times.
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised by:

Robert Johnston	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Vanessa Dechellis
Project name:	W-AO
Project ID:	Not provided
Turnaround time:	10 Day
Date/Time received	Dec 14, 2021 12:07 PM
Eurofins reference	852134

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✗	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Robert Johnston on phone : or by email: RobertJohnston@eurofins.com

Results will be delivered electronically via email to Vanessa Dechellis - vdechellis@lwconsulting.com.au.

Global Leader - Results you can trust

Robert Johnston

From: Vanessa Dechellis <vdechellis@lwconsulting.com.au>
Sent: Tuesday, 14 December 2021 12:07
To: Robert Johnston
Subject: RE: Re-Batch request - samples not on COC
Attachments: ALGAL MAT_COC1 - Re-Batch.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL*

Hi Robert,

Please add the following in place of the below for the test pits and then refer to that attached for the SSA Samples. For the ones requested in the email below, they are included in the attached (refer to the last column highlighted in yellow). I've also added extras. There should be a total of 30 SSA Samples being analysed.

TP037	ASS1	27.8.21	0.00	Soil
TP148	ASS1	10.9.21	0.00	Soil
TP135	ASS1	10.9.21	0.00	Soil
TP137	ASS1	18.9.21	0.00	Soil

From: Robert Johnston <RobertJohnston@eurofins.com>
Sent: Friday, 10 December 2021 3:48 PM
To: Vanessa Dechellis <vdechellis@lwconsulting.com.au>
Subject: RE: Re-Batch request - samples not on COC

Hi Vanessa,

It's been a bit of a mission, but I have been able to locate the samples we do have from the list provided. In saying that, there are a sizeable number of samples that are not on the jobs received, so I was wondering if you could provide feedback on the below missing IDs?
TP34
TP106
TP110
TP119

SSA3
SSA8
SSA19
SSA20
SSA30
SSA48
SSA52

Rob Johnston 14/12/21 Eurofins 852154

SAMPLE CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwcconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie

Date Samples Sent:

COC Checked by:

Location ID	Sample number	Date	Depth (mm)	Matrix	pH and EC 1:5 extract	Total Chloride (1:5 extract)	water soluble sulfate (1:5 extract)	TOC	CEC	TN	TP	Metals: Al, Fe, Na, K, Ca and Mg	pHf and pHfox	General Analysis
SSA001		08.8.21	50-100	Sediment										✓
SSA002		11.8.21	100-150	Sediment										✓
SSA005		24.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA006		24.09.21	100-150	Sediment										✓
SSA011		24.09.21	100-150	Sediment										✓
SSA012		24.09.21	100-150	Sediment										
SSA013		24.09.21	100-150	Sediment										
SSA014		24.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA015		23.09.21	100-150	Sediment										✓
SSA016		23.09.21	100-150	Sediment										✓
SSA017		23.09.21	100-150	Sediment										✓
SSA021		24.09.21	100-150	Sediment										✓
SSA022		12.8.21	100-150	Sediment										✓
SSA024		12.8.21	100-150	Sediment										
SSA025		12.8.21	100-150	Sediment										
SSA026		12.8.21	100-150	Sediment										✓
SSA050		12.8.21	100-150	Sediment										✓
SSA051		12.8.21	50-90	Sediment										✓
SSA054		12.8.21	75-150	Sediment										✓
SSA057		11.8.21	100-150	Sediment										✓
SSA058		08.8.21	0-50	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA059		08.8.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA061		08.8.21	100-150	Sediment										✓
SSA062		08.8.21	100-150	Sediment										✓
SSA068		08.8.21	50-100	Sediment										✓
SSA069		23.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA073		24.09.21	100-150	Sediment										✓
SSA075		24.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA077		24.09.21	100-150	Sediment										✓
SSA082		24.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA084		13.8.21	70-100	Sediment										✓
SSA085		13.8.21	100-150	Sediment										
SSA086		13.8.21	100-150	Sediment										
SSA087		13.8.21	100-150	Sediment	RELABEL AS SSA027 100-150mm									
SSA088		13.8.21	70-100	Sediment	RELABEL AS SSA067 70-100mm									
SSA089		13.8.21	No depth written	Sediment	RELABEL AS SSA086 100-150mm									✓
SSA089		13.8.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA091		08.8.21	100-150	Sediment										
SSA092		08.8.21	100-150	Sediment										
SSA093		08.8.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA094		11.8.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA095		11.8.21	50-100	Sediment										
SSA096		11.8.21	50-100	Sediment										
SSA097		11.8.21	25-75	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA098		12.8.21	60-70	Sediment										✓
SSA099		12.8.21	60-80	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA100		12.8.21	50-100	Sediment										
SSA101		12.8.21	100-150	Sediment										✓
SSA102		12.8.21	100-150	Sediment										✓
SSA103		12.8.21	60-100	Sediment										
SSA103		24.09.21	100-150	Sediment										
SSA107		23.09.21	100-150	Sediment										✓
SSA108		23.09.21	100-150	Sediment										
SSA109		23.09.21	100-150	Sediment										
SSA110		23.09.21	100-150	Sediment										
SSA111		23.09.21	100-150	Sediment										
SSA112		23.09.21	100-150	Sediment										
SSA113		23.09.21	100-150	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓	
SSA114		23.09.21	100-150	Sediment										✓
SSA115		23.09.21	100-150	Sediment										
SSA116		23.09.21	100-150	Sediment										
SSA117		11.8.21	100-150	Sediment										✓
SSA23		12.8.21	100-150	Sediment										✓
			TOTAL	0	7	7	7	7	7	7	7	7	7	30

ADDITIONAL COMMENTS:

Depths labelled on bags

Rob Johnston
14/12/21
Eurofins

852154

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

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.

Attention: **Karen Mackenzie**

Report **856518-S**
Project name W-AO
Received Date Jan 18, 2022

Client Sample ID			**SSA200**	**SSA201**	**SSA099R**	**SSA102R**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Ja18052**	**L22-Ja18053**	**L22-Ja18054**	**L22-Ja18055**
Date Sampled			**Dec 17, 2021**	**Dec 17, 2021**	**Dec 17, 2021**	**Dec 17, 2021**
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	14000	22000	18000	2300
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	7500	9900	7200	10000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.9	8.6	8.0	8.7
Sulphate (as SO4)	30	mg/kg	2600	3900	3100	3000
Total Kjeldahl Nitrogen (as N)	10	mg/kg	39	48	< 10	51
Total Nitrogen (as N)*	10	mg/kg	39	48	< 10	51
Total Organic Carbon	0.1	%	10	0.4	1.1	0.2
Phosphorus	5	mg/kg	120	200	110	230
% Moisture	1	%	14	21	8.3	19
Heavy Metals						
Aluminium	20	mg/kg	6400	13000	4900	19000
Iron	20	mg/kg	14000	30000	38000	44000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	32	40	38	61
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	5	mg/kg	220000	31000	88000	29000
Magnesium	5	mg/kg	8900	23000	16000	26000
Potassium	5	mg/kg	1200	3000	980	3700
Sodium	5	mg/kg	11000	18000	9300	17000
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	8.7	8.8	8.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.8	8.9	8.3	8.8
Reaction Ratings*[S05]	0	-	4.7	5.1	4.4	4.9

Client Sample ID			SSA059	SSA061	SSA085R	SSA062
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ja18056	L22-Ja18057	L22-Ja18058	L22-Ja18059
Date Sampled			Dec 17, 2021	Dec 17, 2021	Dec 17, 2021	Dec 17, 2021
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	28000	35000	44000	36000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	14000	15000	16000	11000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.6	8.4	8.5	8.3
Sulphate (as SO4)	30	mg/kg	5000	4000	4800	4000
Total Kjeldahl Nitrogen (as N)	10	mg/kg	88	77	30	66
Total Nitrogen (as N)*	10	mg/kg	88	77	30	66
Total Organic Carbon	0.1	%	1.0	1.1	1.2	0.2
Phosphorus	5	mg/kg	250	200	270	300
% Moisture	1	%	22	21	25	28
Heavy Metals						
Aluminium	20	mg/kg	11000	16000	14000	24000
Iron	20	mg/kg	33000	34000	26000	42000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	41	33	92	34
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	5	mg/kg	45000	20000	55000	5000
Magnesium	5	mg/kg	37000	29000	44000	30000
Potassium	5	mg/kg	2700	3800	4200	5800
Sodium	5	mg/kg	22000	22000	30000	25000
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.6	8.5	8.3	8.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.5	8.9	8.3	8.5
Reaction Ratings*[S05]	0	-	5.1	5.1	5.3	5.6

Client Sample ID			SSA063	SSA064	SSA065	SSA066
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ja18060	L22-Ja18061	L22-Ja18062	L22-Ja18063
Date Sampled			Dec 17, 2021	Dec 17, 2021	Dec 17, 2021	Dec 17, 2021
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	32000	40000	38000	13000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	13000	13000	18000	8100
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	7.1	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.5	8.5	8.3	8.6
Sulphate (as SO4)	30	mg/kg	4400	5100	4200	2100
Total Kjeldahl Nitrogen (as N)	10	mg/kg	120	180	200	33
Total Nitrogen (as N)*	10	mg/kg	120	180	207.1	33
Total Organic Carbon	0.1	%	0.3	0.6	0.8	0.6
Phosphorus	5	mg/kg	300	290	310	240
% Moisture	1	%	26	26	27	18
Heavy Metals						
Aluminium	20	mg/kg	20000	17000	18000	12000
Iron	20	mg/kg	38000	37000	34000	28000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	50	47	48	35

Client Sample ID			SSA063	SSA064	SSA065	SSA066
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ja18060	L22-Ja18061	L22-Ja18062	L22-Ja18063
Date Sampled			Dec 17, 2021	Dec 17, 2021	Dec 17, 2021	Dec 17, 2021
Test/Reference	LOR	Unit				
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	5	mg/kg	23000	21000	35000	33000
Magnesium	5	mg/kg	33000	37000	46000	33000
Potassium	5	mg/kg	5000	4300	4500	2300
Sodium	5	mg/kg	26000	25000	25000	9400
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	8.6	8.7	8.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.6	8.7	8.6	8.7
Reaction Ratings*[S05]	0	-	5.4	5.4	5.5	4.9

Client Sample ID			SSA039	SSA205	SSA038	SSA204
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ja18064	L22-Ja18065	L22-Ja18066	L22-Ja18067
Date Sampled			Dec 17, 2021	Dec 17, 2021	Dec 17, 2021	Dec 17, 2021
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	13000	17000	13000	11000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	8300	11000	6200	5800
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.6	8.3	8.6	8.3
Sulphate (as SO4)	30	mg/kg	2300	3000	2100	1700
Total Kjeldahl Nitrogen (as N)	10	mg/kg	120	80	310	140
Total Nitrogen (as N)*	10	mg/kg	120	80	310	140
Total Organic Carbon	0.1	%	0.2	0.4	0.6	0.3
Phosphorus	5	mg/kg	160	240	170	140
% Moisture	1	%	17	21	22	19
Heavy Metals						
Aluminium	20	mg/kg	11000	25000	17000	11000
Iron	20	mg/kg	31000	48000	35000	25000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	35	28	39	24
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	5	mg/kg	13000	2400	8100	5300
Magnesium	5	mg/kg	24000	21000	19000	12000
Potassium	5	mg/kg	2000	4000	3000	2300
Sodium	5	mg/kg	11000	15000	6900	6800
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	9.0	8.4	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.8	8.7	8.6	8.4
Reaction Ratings*[S05]	0	-	4.8	5.1	5.1	4.9

Client Sample ID			SSA040	SSA071	SSA203	SSA041
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ja18068	L22-Ja18069	L22-Ja18070	L22-Ja18071
Date Sampled			Dec 17, 2021	Dec 17, 2021	Dec 17, 2021	Dec 17, 2021
Test/Reference	LOR	Unit				
Chloride	5	mg/kg	27000	14000	28000	24000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	8500	9300	14000	13000
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.1	8.3	8.3	8.5
Sulphate (as SO4)	30	mg/kg	2600	11000	3200	3100
Total Kjeldahl Nitrogen (as N)	10	mg/kg	210	360	34	21
Total Nitrogen (as N)*	10	mg/kg	210	360	34	21
Total Organic Carbon	0.1	%	0.4	0.5	3.1	1.2
Phosphorus	5	mg/kg	210	230	180	200
% Moisture	1	%	29	13	20	21
Heavy Metals						
Aluminium	20	mg/kg	16000	6300	14000	12000
Iron	20	mg/kg	33000	9100	27000	23000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	40	190	32	39
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	5	mg/kg	14000	88000	5100	36000
Magnesium	5	mg/kg	39000	46000	38000	33000
Potassium	5	mg/kg	3200	1400	3000	2300
Sodium	5	mg/kg	16000	7400	19000	15000
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.6	8.2	8.4	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.4	7.1	8.6	8.7
Reaction Ratings*[S05]	0	-	5.6	2.3	5.0	5.1

Client Sample ID			SSA072
Sample Matrix			Soil
Eurofins Sample No.			L22-Ja18072
Date Sampled			Dec 17, 2021
Test/Reference	LOR	Unit	
Chloride	5	mg/kg	12000
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	9300
Nitrate & Nitrite (as N)	5	mg/kg	< 5
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	8.4
Sulphate (as SO4)	30	mg/kg	10000
Total Kjeldahl Nitrogen (as N)	10	mg/kg	400
Total Nitrogen (as N)*	10	mg/kg	400
Total Organic Carbon	0.1	%	2.0
Phosphorus	5	mg/kg	460
% Moisture	1	%	13
Heavy Metals			
Aluminium	20	mg/kg	16000
Iron	20	mg/kg	22000
Cation Exchange Capacity			
Cation Exchange Capacity	0.05	meq/100g	130

Client Sample ID			SSA072
Sample Matrix			**Soil**
Eurofins Sample No.			**L22-Ja18072**
Date Sampled			**Dec 17, 2021**
Test/Reference	LOR	Unit	
Eurofins Suite B11C: Na/K/Ca/Mg			
Calcium	5	mg/kg	48000
Magnesium	5	mg/kg	74000
Potassium	5	mg/kg	2800
Sodium	5	mg/kg	9200
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	8.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	8.0
Reaction Ratings*[S05]	0	-	4.6

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Melbourne	Jan 21, 2022	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Jan 21, 2022	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Sulphate (as SO4)	Melbourne	Jan 21, 2022	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Total Organic Carbon	Melbourne	Jan 24, 2022	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Heavy Metals	Melbourne	Jan 21, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Melbourne	Jan 21, 2022	180 Days
- Method: LTM-MET-3010 Alkali Metals by ICP-AES			
Acid Sulfate Soils Field pH Test	Welshpool	Jan 19, 2022	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Jan 21, 2022	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Jan 24, 2022	28 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Jan 21, 2022	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Jan 21, 2022	28 Days
- Method: APHA 4500-Norg B,D Total Kjeldahl Nitrogen by FIA			
Eurofins Suite B19A: Total N (TKN, NOx), Total P			
Phosphorus	Melbourne	Jan 21, 2022	180 Days
- Method: LTM-MET-3010 Alkali Metals Sulfur Silicon and Phosphorus by ICP-AES			
% Moisture	Melbourne	Jan 19, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name: W-AO

Order No.:
Report #: 856518
Phone: 08 8271 5255
Fax:

Received: Jan 18, 2022 5:45 PM
Due: Jan 26, 2022
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Aluminium	Chloride	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Total Organic Carbon	Acid Sulfate Soils Field pH Test	Moisture Set	Cation Exchange Capacity	Eurofins Suite B19A: Total N (TKN, NOx), Total P	Eurofins Suite B11C: Na/K/Ca/Mg
Perth Laboratory - NATA # 2377 Site # 2370												X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																
Brisbane Laboratory - NATA # 1261 Site # 20794																
Mayfield Laboratory - NATA # 1261 Site # 25079																
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	SSA200	Dec 17, 2021		Soil	L22-Ja18052	X	X	X	X	X	X	X	X	X	X	X
2	SSA201	Dec 17, 2021		Soil	L22-Ja18053	X	X	X	X	X	X	X	X	X	X	X
3	SSA099R	Dec 17, 2021		Soil	L22-Ja18054	X	X	X	X	X	X	X	X	X	X	X
4	SSA102R	Dec 17, 2021		Soil	L22-Ja18055	X	X	X	X	X	X	X	X	X	X	X
5	SSA059	Dec 17, 2021		Soil	L22-Ja18056	X	X	X	X	X	X	X	X	X	X	X
6	SSA061	Dec 17, 2021		Soil	L22-Ja18057	X	X	X	X	X	X	X	X	X	X	X
7	SSA085R	Dec 17, 2021		Soil	L22-Ja18058	X	X	X	X	X	X	X	X	X	X	X
8	SSA062	Dec 17, 2021		Soil	L22-Ja18059	X	X	X	X	X	X	X	X	X	X	X
9	SSA063	Dec 17, 2021		Soil	L22-Ja18060	X	X	X	X	X	X	X	X	X	X	X
10	SSA064	Dec 17, 2021		Soil	L22-Ja18061	X	X	X	X	X	X	X	X	X	X	X

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Phone : 0800 856 450
IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name: W-AO

Order No.:
Report #: 856518
Phone: 08 8271 5255
Fax:

Received: Jan 18, 2022 5:45 PM
Due: Jan 26, 2022
Priority: 5 Day
Contact Name: Karen Mackenzie

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Aluminium	Chloride	Iron	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Total Organic Carbon	Acid Sulfate Soils Field pH Test	Moisture Set	Cation Exchange Capacity	Eurofins Suite B19A: Total N (TKN, NOx), Total P	Eurofins Suite B11C: Na/K/Ca/Mg
Perth Laboratory - NATA # 2377 Site # 2370												X				
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217																
Brisbane Laboratory - NATA # 1261 Site # 20794																
Mayfield Laboratory - NATA # 1261 Site # 25079																
External Laboratory																
11	SSA065	Dec 17, 2021		Soil	L22-Ja18062	X	X	X	X	X	X	X	X	X	X	X
12	SSA066	Dec 17, 2021		Soil	L22-Ja18063	X	X	X	X	X	X	X	X	X	X	X
13	SSA039	Dec 17, 2021		Soil	L22-Ja18064	X	X	X	X	X	X	X	X	X	X	X
14	SSA205	Dec 17, 2021		Soil	L22-Ja18065	X	X	X	X	X	X	X	X	X	X	X
15	SSA038	Dec 17, 2021		Soil	L22-Ja18066	X	X	X	X	X	X	X	X	X	X	X
16	SSA204	Dec 17, 2021		Soil	L22-Ja18067	X	X	X	X	X	X	X	X	X	X	X
17	SSA040	Dec 17, 2021		Soil	L22-Ja18068	X	X	X	X	X	X	X	X	X	X	X
18	SSA071	Dec 17, 2021		Soil	L22-Ja18069	X	X	X	X	X	X	X	X	X	X	X
19	SSA203	Dec 17, 2021		Soil	L22-Ja18070	X	X	X	X	X	X	X	X	X	X	X
20	SSA041	Dec 17, 2021		Soil	L22-Ja18071	X	X	X	X	X	X	X	X	X	X	X
21	SSA072	Dec 17, 2021		Soil	L22-Ja18072	X	X	X	X	X	X	X	X	X	X	X
						21	21	21	21	21	21	21	21	21	21	21

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Perth Laboratory - NATA # 2377 Site # 2370							X				
Melbourne Laboratory - NATA # 1261 Site # 1254	X	X	X	X	X	X		X	X	X	X
Sydney Laboratory - NATA # 1261 Site # 18217											
Brisbane Laboratory - NATA # 1261 Site # 20794											
Mayfield Laboratory - NATA # 1261 Site # 25079											
External Laboratory											
Test Counts	21	21	21	21	21	21	21	21	21	21	21

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 5			5	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/kg	< 5			5	Pass	
Sulphate (as SO4)	mg/kg	< 30			30	Pass	
Total Kjeldahl Nitrogen (as N)	mg/kg	< 10			10	Pass	
Total Organic Carbon	%	< 0.1			0.1	Pass	
Phosphorus	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Aluminium	mg/kg	< 20			20	Pass	
Iron	mg/kg	< 20			20	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/kg	< 5			5	Pass	
Magnesium	mg/kg	< 5			5	Pass	
Potassium	mg/kg	< 5			5	Pass	
Sodium	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Chloride	%	104			70-130	Pass	
Nitrate & Nitrite (as N)	%	106			70-130	Pass	
Sulphate (as SO4)	%	103			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	86			70-130	Pass	
Total Organic Carbon	%	101			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium	%	105			80-120	Pass	
Iron	%	110			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Iron	L22-Ja19804	NCP	%	128			75-125	Fail	Q08
Spike - % Recovery									
				Result 1					
Total Kjeldahl Nitrogen (as N)	L22-Ja18061	CP	%	86			70-130	Pass	
Spike - % Recovery									
				Result 1					
Total Kjeldahl Nitrogen (as N)	L22-Ja18067	CP	%	126			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	L22-Ja18069	CP	%	107			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	N22-Ja16558	NCP	%	10	10	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen (as N)	L22-Ja18053	CP	mg/kg	48	37	25	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Chloride	L22-Ja18055	CP	mg/kg	2300	2300	<1	30%	Pass	
Sulphate (as SO4)	L22-Ja18055	CP	mg/kg	3000	3000	1.0	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L22-Ja18055	CP	pH Units	8.6	8.8	pass	30%	Pass	
Reaction Ratings*	L22-Ja18055	CP	-	4.9	4.9	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L22-Ja18057	CP	uS/cm	15000	15000	1.3	30%	Pass	
Nitrate & Nitrite (as N)	L22-Ja18057	CP	mg/kg	< 5	< 5	<1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L22-Ja18057	CP	pH Units	8.4	8.3	pass	30%	Pass	
Total Kjeldahl Nitrogen (as N)	L22-Ja18057	CP	mg/kg	77	92	17	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L22-Ja18059	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	L22-Ja18059	CP	mg/kg	24000	24000	2.0	30%	Pass	
Iron	L22-Ja18059	CP	mg/kg	42000	42000	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Phosphorus	L22-Ja18060	CP	mg/kg	300	300	1.0	30%	Pass	
Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	L22-Ja18060	CP	meq/100g	50	50	<1	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	L22-Ja18060	CP	mg/kg	23000	23000	<1	30%	Pass	
Magnesium	L22-Ja18060	CP	mg/kg	33000	33000	1.0	30%	Pass	
Potassium	L22-Ja18060	CP	mg/kg	5000	5000	<1	30%	Pass	
Sodium	L22-Ja18060	CP	mg/kg	26000	26000	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	L22-Ja18062	CP	%	0.8	1.1	38	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L22-Ja18064	CP	uS/cm	8300	8700	4.1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L22-Ja18064	CP	pH Units	8.6	8.6	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L22-Ja18065	CP	uS/cm	11000	11000	1.6	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L22-Ja18065	CP	pH Units	8.3	8.3	pass	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L22-Ja18065	CP	pH Units	9.0	9.0	pass	30%	Pass	
Reaction Ratings*	L22-Ja18065	CP	-	5.1	5.1	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	L22-Ja18067	CP	uS/cm	5800	5600	2.8	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	L22-Ja18067	CP	pH Units	8.3	8.2	pass	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Phosphorus	L22-Ja18068	CP	mg/kg	210	200	5.0	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	L22-Ja18068	CP	mg/kg	14000	13000	6.0	30%	Pass	
Magnesium	L22-Ja18068	CP	mg/kg	39000	36000	7.0	30%	Pass	
Potassium	L22-Ja18068	CP	mg/kg	3200	3000	8.0	30%	Pass	
Sodium	L22-Ja18068	CP	mg/kg	16000	15000	8.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	L22-Ja18069	CP	mg/kg	6300	7100	12	30%	Pass	
Iron	L22-Ja18069	CP	mg/kg	9100	9600	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	L22-Ja18070	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	L22-Ja18071	CP	meq/100g	39	38	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Robert Johnston	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Karen Mackenzie
Project name:	W-AO
Project ID:	Not provided
Turnaround time:	5 Day
Date/Time received	Jan 18, 2022 5:45 PM
Eurofins reference	856518

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Samples received by the laboratory after 5.30pm are deemed to have been received the following working day.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Robert Johnston on phone : or by email: RobertJohnston@eurofins.com

Results will be delivered electronically via email to Karen Mackenzie - kmackenzie@lwconsulting.com.au.

Global Leader - Results you can trust

Robert Johnston

From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Tuesday, 18 January 2022 17:45
To: Robert Johnston
Subject: RE: W-AO-3 soils received
Attachments: Rock samples_COC_171221.xlsx; ALGAL MAT_COC_171221.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL EMAIL*

Hi Rob,

The 19 sediment samples with the sample ID SSA should be scheduled for analysis at Eurofins as per the attached COC ALGAL MAT_COC_171221.

The rock samples with location ID MWXXX should remain at Eurofins until I have a quote number to submit them to Microanalysis under. I will hopefully have this tomorrow.

Many thanks,

Karen

Dr Karen Mackenzie | Principal Geochemist

Land & Water Consulting
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191 St Georges Terrace, Perth, WA 6000
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Rob Johnston 18/1/22 17:45 Eurofins
856518

SAMPLE CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 210727LWCW

LWC Project No: W-AO

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

Project Manager:
Karen Mackenzie
Date Samples Sent:
17-Dec-21

Location ID	Sample numbe	Date	Depth (mm)	Matrix	pH and EC 1:5 extract	Total Chloride (1:5 extract)	water soluble sulfate (1:5 extract)	TOC	CEC	TN	TP	Metals: Al, Fe, Na, K, Ca and Mg	pHf and pHfox
SSA200		17.12.21	50.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA201		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA099R		17.12.21	0-50	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA102R		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA059		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA061		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA085R		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA062		17.12.21		Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA063		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA064		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA065		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA066		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA039		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA205		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA038		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA204		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA040		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA071		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA203		17.12.21	50.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA041		17.12.21	100.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓
SSA072		17.12.21	50.00	Sediment	✓	✓	✓	✓	✓	✓	✓	✓	✓

Rob Johnston 18/11/22 Eurofins 856518

SAMPLE CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210727LWCW

LWC Project No:
W-AO

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

Project Manager:
Karen Mackenzie
Date Samples Sent:
17-Dec-21

Location ID	Sample number	Date	Depth (m)	Matrix	Dispatch to Microanalysis						
MW12		17.12.21	5.50	Rock	1						
MW12		17.12.21	5.00	Rock	1						
MW13		17.12.21	7.50	Rock	1						
MW13		17.12.21	9.50	Rock	1						
MW13		17.12.21	2.00	Rock	1						
MW12		17.12.21	7.00	Rock	1						
MW12		17.12.21	7.50	Rock	1						
MW12		17.12.21	1.00	Rock	1						
MW12		17.12.21	20.00	Rock	1						
MW12		17.12.21	4.00	Rock	1						
MW12		17.12.21	3.00	Rock	1						
MW01		17.12.21	10.00	Rock	1						
MW01		17.12.21	2.00	Rock	1						
MW01		17.12.21	6.00	Rock	1						
MW05		17.12.21	7.00	Rock	1						
MW05		17.12.21	12.00	Rock	1						

CHAIN OF CUSTODY FORM

From : Land & Water Consulting Pty Ltd
Suite 3, 4-8 Goodwood Road, WAYVILLE, SA, 5034
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

Eurofins

LAB Quote Number: 210920LWCW

LWC Contact Information:
Contact Name:
Karen Mackenzie
Contact Email:
laboratory.results@lwconsulting.com.au
epicken@lwconsulting.com.au

Phone Number:
08 8271 5255

LWC Project No:
W-AO-3

Project Manager:
Karen Mackenzie

Date Samples Sent:
~~30/08/2021~~ 17.12.21

COC Checked by: Alistair Vaughan

Lab ID	Date	Matrix	Sample ID	No. Bottles	Sample Analysis: Suite 1	Suite 2	Suite 3	Suite 4	Suite 5				
					Tick required analytes								
		S	SSA041 (10 cm)	1									
			SSA072 (5 cm)										
			MW12_5.5m										
			MW12_5.0m										
			MW13_7.5m										
			MW13_9.5m										
			MW13_2.0m										
			MW12_7.0m										
			MW12_7.5m										
			MW12_1.0m										
			MW12_20.0m										
			MW12_2.0m										
			MW12_4.0m										
			MW12_3.0m										
			MW01_10.0m										
			MW01_2.0m										
			MW01_6.0m										
			MW05_7.0m										
			MW05_12.0m										
			TOTAL	0									

ADDITIONAL COMMENTS:

Suite 1 - Major components, metals and nutrients:
- ☐EC
- ☐Total dissolved solids (TDS) and Total Suspended Solids (TSS).
- ☐Laboratory pH
- ☐Major Ions including calcium, sodium, potassium, magnesium, chloride, sulphate, bicarbonate and carbonate.
- ☐Hydroxide alkalinity as CaCO3, carbonate alkalinity as CaCO3 and bicarbonate as CaCO3.
- ☐Water Hardness
- ☐Total and dissolved metals including Al, As, Be, Bi, Cd, Co, Cr, Cu, Fe, Li, Mn, Mo, Ni, Pb, Sb, Ag, SiO2, Se, Sr, Th, Ti, U, V, Zn and Zr.
- ☐Speciation of Ferric Iron and Ferrous Iron (actual and not calculated)
- ☐Nutrients including total nitrogen, nitrate as N, nitrite as N, ammonia, TKN and filtered reactive phosphorous.

Suite 2 - Drilling Muds Check (for rotary mud method):
- ☐Major cations and anions
- ☐Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, total Xylenes, Naphthalene (BTEXN)

Suite 3 - Hydrocarbons:
- ☐Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, total Xylenes, Naphthalene (BTEXN)

Suite 4 - Rinsate Screen:
- ☐Total metals including Al, As, Be, Bi, Cd, Co, Cr, Cu, Fe, Li, Mn, Mo, Ni, Pb, Sb, Ag, SiO2, Se, Sr, Th, Ti, U, V, Zn and Zr.

Suite 5 - Trip blank
- ☐TRH Fraction C6-C10 and BTEXN

Analysis to follow

Date/Time: 20/12/21 10:00
Chilled: (Yes) No
Temp: 20.8 / 20.2 / 20.9 / 0.0
Final temp: 20.6°C

Note:
Metals samples have been field filtered using 0.45um, however, 0.22um filtering is required for the following samples for the analysis of metals:

CHAIN OF CUSTODY FORM

From : Land & Water Consulting Pty Ltd
Suite 3, 4-8 Goodwood Road, WAYVILLE, SA, 5034
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210920LWCW

LWC Contact Information:
Contact Name:
Karen Mackenzie
Contact Email:
laboratoryresults@lwconsulting.com.au
eericken@lwconsulting.com.au

Phone Number:
08 8271 5255

LWC Project No:
W-AO-3

Project Manager:
Karen Mackenzie

Date Samples Sent:
~~30/08/2021~~ 17.12.21

COC Checked by: Ahstair Vaughan

Eurofins

Sample Analysis

Lab ID	Date	Matrix	Sample ID	No. Bottles	Suite 1	Suite 2	Suite 3	Suite 4	Suite 5
		S	SSA200 (5cm)	1	Tick required analytes				
			SSA201 (10 cm)						
			SSA099R (0-5 cm)						
			SSA102R (10 cm)						
			SSA059 (10 cm)						
			SSA061 (10 cm)						
			SSA085R (10 cm)						
			SSA062						
			SSA063 (10 cm)						
			SSA064 (10 cm)						
			SSA065 (10 cm)						
			SSA066 (10 cm)						
			SSA039 (10 cm)						
			SSA205 (10 cm)						
			SSA038 (10 cm)						
			SSA204 (10 cm)						
			SSA040 (10 cm)						
			SSA071 (10 cm)						
			SSA203 (5cm)						
			TOTAL	0					

ADDITIONAL COMMENTS:

Suite 1 - Major components, metals and nutrients:
☐EC
☐Total dissolved solids (TDS) and Total Suspended Solids (TSS).
☐Laboratory pH
☐Major Ions including calcium, sodium, potassium, magnesium, chloride, sulphate, bicarbonate and carbonate.
☐Hydroxide alkalinity as CaCO3, carbonate alkalinity as CaCO3 and bicarbonate as CaCO3.
☐Water Hardness
☐Total and dissolved metals including Al, As, Be, Bi, Cd, Co, Cr, Cu, Fe, Li, Mn, Mo, Ni, Pb, Sb, Ag, SiO2, Se, Sr, Th, Ti, U, V, Zn and Zr.
☐Speciation of Ferric Iron and Ferrous Iron (actual and not calculated).
☐Nutrients including total nitrogen, nitrate as N, nitrite as N, ammonia, TKN and filtered reactive phosphorous.

Suite 2 - Drilling Muds Check (for rotary mud method):
☐Major cations and anions
☐Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, total Xylenes, Naphthalene (BTEXN)

Suite 3 - Hydrocarbons:
☐Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, total Xylenes, Naphthalene (BTEXN)

Suite 4 - Rinsate Screen:
☐Total metals including Al, As, Be, Bi, Cd, Co, Cr, Cu, Fe, Li, Mn, Mo, Ni, Pb, Sb, Ag, SiO2, Se, Sr, Th, Ti, U, V, Zn and Zr.

Suite 5 - Tripblank
☐TRH Fraction C6-C10 and BTEXN

Analysis to follow

Date/Time: 20/12/21 10:00

Cooler No
20.8
20.2
20.9
0.0

Note:
Metals samples have been field filtered using 0.45um, however, 0.22um filtering is required for the following samples for the analysis of metals:

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

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.

Attention: **Riley Martin**

Report **879589-S**
Project name
Project ID W-AO-04
Received Date Apr 08, 2022

Client Sample ID			**SS202**	**SS203**	**SS209**	**SS212**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Ap0026414**	**L22-Ap0026415**	**L22-Ap0026416**	**L22-Ap0026417**
Date Sampled			**Mar 29, 2022**	**Mar 29, 2022**	**Mar 29, 2022**	**Mar 29, 2022**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	46	21	87	< 10
Conductivity	0.01	mS/cm	0.12	0.12	0.19	0.11
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	24	24	22	20
Exchangeable Magnesium	0.2	cmolc/kg	6.0	4.9	7.3	2.8
Exchangeable Potassium	0.05	cmolc/kg	0.43	0.74	0.74	1.4
Exchangeable Sodium	0.2	cmolc/kg	0.5	0.3	1.0	< 0.2
Nitrate-N	1	mg/kg	3.5	2.9	2.0	4.6
NOx-N	1	mg/kg	4.2	3.7	2.7	5.3
pH	0.1	pH Units	9.0	8.9	9.0	8.8
Sulfate	10	mg/kg	31	16	< 10	< 10
Total Kjeldahl Nitrogen	10	mg/kg	500	460	650	430
Total Nitrogen	10	mg/kg	500	460	650	440
Calcium	10	mg/kg	30000	20000	29000	22000
Cation Exchange Capacity	1	cmolc/kg	31	30	31	24
Iron	1	mg/kg	49000	48000	43000	40000
Magnesium	10	mg/kg	7700	7500	6900	7000
Manganese	1	mg/kg	1300	1000	830	1700
Phosphorus	1	mg/kg	110	120	110	280
% Moisture	1	%	6.1	5.8	5.1	3.8
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			**SS215**	**SS216**	**SS119**	**SS102**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Ap0026418**	**L22-Ap0026419**	**L22-Ap0026420**	**L22-Ap0026421**
Date Sampled			**Mar 29, 2022**	**Mar 29, 2022**	**Mar 29, 2022**	**Mar 30, 2022**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	170	11	1300	38
Conductivity	0.01	mS/cm	0.25	0.12	1.1	0.06
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	20	20	13	2.3
Exchangeable Magnesium	0.2	cmolc/kg	5.8	7.6	2.8	0.7

Client Sample ID			SS215	SS216	SS119	SS102
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026418	L22-Ap0026419	L22-Ap0026420	L22-Ap0026421
Date Sampled			Mar 29, 2022	Mar 29, 2022	Mar 29, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Exchangeable Potassium	0.05	cmolc/kg	0.62	0.74	< 0.2	0.32
Exchangeable Sodium	0.2	cmolc/kg	1.4	0.7	3.4	< 0.2
Nitrate-N	1	mg/kg	2.4	2.3	< 1	2.8
NOx-N	1	mg/kg	2.8	3.3	1.1	3.1
pH	0.1	pH Units	9.2	9.0	9.1	8.0
Sulfate	10	mg/kg	< 10	< 10	43	10
Total Kjeldahl Nitrogen	10	mg/kg	520	330	41	140
Total Nitrogen	10	mg/kg	520	330	42	140
Calcium	10	mg/kg	14000	14000	27000	1100
Cation Exchange Capacity	1	cmolc/kg	28	29	19	3.3
Iron	1	mg/kg	47000	54000	16000	20000
Magnesium	10	mg/kg	6800	8200	3100	2500
Manganese	1	mg/kg	730	2300	410	160
Phosphorus	1	mg/kg	96	94	1900	94
% Moisture	1	%	3.9	6.0	< 1	5.8
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS213	SS211	SS214	SS111
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026422	L22-Ap0026423	L22-Ap0026424	L22-Ap0026425
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	14	5100	1400	< 10
Conductivity	0.01	mS/cm	0.12	3.4	1.0	0.10
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	16	6.8	13	34
Exchangeable Magnesium	0.2	cmolc/kg	3.2	9.0	4.1	4.8
Exchangeable Potassium	0.05	cmolc/kg	0.74	0.53	0.52	1.0
Exchangeable Sodium	0.2	cmolc/kg	< 0.2	9.1	4.3	< 0.2
Nitrate-N	1	mg/kg	4.0	10	5.3	4.1
NOx-N	1	mg/kg	4.9	10	5.8	4.2
pH	0.1	pH Units	8.4	7.6	8.4	8.9
Sulfate	10	mg/kg	< 10	150	13	< 10
Total Kjeldahl Nitrogen	10	mg/kg	620	230	240	370
Total Nitrogen	10	mg/kg	620	240	250	370
Calcium	10	mg/kg	8200	2600	3900	28000
Cation Exchange Capacity	1	cmolc/kg	20	25	22	40
Iron	1	mg/kg	48000	55000	42000	46000
Magnesium	10	mg/kg	7100	5900	5500	9000
Manganese	1	mg/kg	670	740	660	1100
Phosphorus	1	mg/kg	130	120	75	110
% Moisture	1	%	4.9	6.0	4.3	11
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS105	SS101	SS109	SS113
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026426	L22-Ap0026427	L22-Ap0026428	L22-Ap0026429
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	37	< 10	< 10	< 10
Conductivity	0.01	mS/cm	0.11	0.02	0.10	0.11
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	30	2.3	30	27
Exchangeable Magnesium	0.2	cmolc/kg	2.3	1.3	4.3	4.3
Exchangeable Potassium	0.05	cmolc/kg	0.80	0.43	0.90	1.5
Exchangeable Sodium	0.2	cmolc/kg	0.3	0.3	< 0.2	< 0.2
Nitrate-N	1	mg/kg	4.8	2.9	3.4	7.5
NOx-N	1	mg/kg	5.2	3.0	3.6	7.9
pH	0.1	pH Units	9.0	7.4	8.9	8.6
Sulfate	10	mg/kg	< 10	< 10	< 10	< 10
Total Kjeldahl Nitrogen	10	mg/kg	380	170	510	770
Total Nitrogen	10	mg/kg	390	170	510	780
Calcium	10	mg/kg	10000	840	37000	17000
Cation Exchange Capacity	1	cmolc/kg	33	4.3	35	33
Iron	1	mg/kg	43000	28000	42000	49000
Magnesium	10	mg/kg	5600	2100	7700	9500
Manganese	1	mg/kg	900	420	930	890
Phosphorus	1	mg/kg	140	170	100	170
% Moisture	1	%	13	7.9	11	16
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS103	SS112	SS108	SS110
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026430	L22-Ap0026431	L22-Ap0026432	L22-Ap0026433
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	< 10	< 10	< 10
Conductivity	0.01	mS/cm	0.02	0.08	0.11	0.10
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	2.4	15	23	33
Exchangeable Magnesium	0.2	cmolc/kg	0.9	2.0	4.5	4.5
Exchangeable Potassium	0.05	cmolc/kg	0.43	0.44	0.91	1.1
Exchangeable Sodium	0.2	cmolc/kg	< 0.2	< 0.2	0.7	< 0.2
Nitrate-N	1	mg/kg	2.0	3.3	2.8	4.9
NOx-N	1	mg/kg	2.2	3.4	3.0	5.1
pH	0.1	pH Units	8.6	8.9	9.3	8.8
Sulfate	10	mg/kg	< 10	< 10	< 10	< 10
Total Kjeldahl Nitrogen	10	mg/kg	190	190	360	520
Total Nitrogen	10	mg/kg	190	190	360	530
Calcium	10	mg/kg	950	8700	9700	27000
Cation Exchange Capacity	1	cmolc/kg	3.7	17	29	39
Iron	1	mg/kg	15000	26000	35000	46000
Magnesium	10	mg/kg	1600	5100	5500	8900
Manganese	1	mg/kg	230	390	770	1800
Phosphorus	1	mg/kg	56	120	110	150

Client Sample ID			SS103	SS112	SS108	SS110
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026430	L22-Ap0026431	L22-Ap0026432	L22-Ap0026433
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
% Moisture	1	%	6.6	8.3	12	12
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS104	SS107	SS205	SS210
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026434	L22-Ap0026435	L22-Ap0026436	L22-Ap0026437
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	8000	6100	38
Conductivity	0.01	mS/cm	0.02	4.2	4.2	0.13
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	6.0	26	20	18
Exchangeable Magnesium	0.2	cmolc/kg	2.3	6.2	7.2	3.1
Exchangeable Potassium	0.05	cmolc/kg	0.54	0.79	0.64	0.32
Exchangeable Sodium	0.2	cmolc/kg	< 0.2	21	19	0.5
Nitrate-N	1	mg/kg	2.4	25	18	4.5
NOx-N	1	mg/kg	2.5	26	18	4.8
pH	0.1	pH Units	8.0	8.8	8.5	9.1
Sulfate	10	mg/kg	< 10	130	100	22
Total Kjeldahl Nitrogen	10	mg/kg	270	370	370	220
Total Nitrogen	10	mg/kg	270	400	390	220
Calcium	10	mg/kg	2500	21000	7500	8600
Cation Exchange Capacity	1	cmolc/kg	8.8	54	47	22
Iron	1	mg/kg	38000	38000	43000	35000
Magnesium	10	mg/kg	3700	7700	6800	5000
Manganese	1	mg/kg	540	1600	720	550
Phosphorus	1	mg/kg	150	160	95	90
% Moisture	1	%	8.1	11	5.7	5.5
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS217	DUP1	DUP2	SS201
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026438	L22-Ap0026439	L22-Ap0026440	L22-Ap0026441
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	24000	630	3300	14000
Conductivity	0.01	mS/cm	12	0.11	2.4	11
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	10	17	22	20
Exchangeable Magnesium	0.2	cmolc/kg	23	3.7	4.4	11
Exchangeable Potassium	0.05	cmolc/kg	4.4	0.87	0.77	2.8
Exchangeable Sodium	0.2	cmolc/kg	64	0.5	14	58
Nitrate-N	1	mg/kg	< 1	3.2	12	20

Client Sample ID			SS217	DUP1	DUP2	SS201
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026438	L22-Ap0026439	L22-Ap0026440	L22-Ap0026441
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
NOx-N	1	mg/kg	< 1	3.5	13	20
pH	0.1	pH Units	8.5	9.3	9.2	8.7
Sulfate	10	mg/kg	1400	< 10	80	2300
Total Kjeldahl Nitrogen	10	mg/kg	100	330	330	460
Total Nitrogen	10	mg/kg	100	330	340	480
Calcium	10	mg/kg	4100	13000	12000	3200
Cation Exchange Capacity	1	cmolc/kg	100	22	41	92
Iron	1	mg/kg	49000	42000	36000	35000
Magnesium	10	mg/kg	14000	6300	6100	20000
Manganese	1	mg/kg	830	870	1500	440
Phosphorus	1	mg/kg	200	91	120	210
% Moisture	1	%	20	7.9	9.2	9.4
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS204	SS206	SS116	SS121
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026442	L22-Ap0026443	L22-Ap0026444	L22-Ap0026445
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	4900	< 10	100	11
Conductivity	0.01	mS/cm	3.4	0.05	0.21	0.09
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	29	5.9	22	13
Exchangeable Magnesium	0.2	cmolc/kg	3.0	1.8	2.4	0.6
Exchangeable Potassium	0.05	cmolc/kg	0.96	0.43	0.42	< 0.2
Exchangeable Sodium	0.2	cmolc/kg	19	< 0.2	0.7	< 0.2
Nitrate-N	1	mg/kg	32	2.7	3.2	< 1
NOx-N	1	mg/kg	33	2.8	3.3	< 1
pH	0.1	pH Units	9.0	8.1	9.3	8.7
Sulfate	10	mg/kg	89	< 10	40	< 10
Total Kjeldahl Nitrogen	10	mg/kg	430	370	220	32
Total Nitrogen	10	mg/kg	460	370	220	32
Calcium	10	mg/kg	24000	2200	21000	8100
Cation Exchange Capacity	1	cmolc/kg	52	8.1	26	14
Iron	1	mg/kg	33000	39000	47000	15000
Magnesium	10	mg/kg	6100	6100	6000	2200
Manganese	1	mg/kg	1000	600	720	480
Phosphorus	1	mg/kg	100	120	120	50
% Moisture	1	%	6.7	7.1	5.6	< 1
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS120	SS117	SS115	SS118
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026446	L22-Ap0026447	L22-Ap0026448	L22-Ap0026449
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	< 10	160	< 10
Conductivity	0.01	mS/cm	0.11	0.10	0.36	0.09
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	20	24	19	21
Exchangeable Magnesium	0.2	cmolc/kg	2.7	5.3	1.8	3.6
Exchangeable Potassium	0.05	cmolc/kg	0.94	1.1	0.53	1.2
Exchangeable Sodium	0.2	cmolc/kg	< 0.2	0.2	3.6	< 0.2
Nitrate-N	1	mg/kg	5.6	3.2	2.8	2.2
NOx-N	1	mg/kg	5.8	3.3	3.0	2.3
pH	0.1	pH Units	8.7	8.9	9.9	9.0
Sulfate	10	mg/kg	< 10	< 10	15	< 10
Total Kjeldahl Nitrogen	10	mg/kg	890	550	260	550
Total Nitrogen	10	mg/kg	900	550	260	550
Calcium	10	mg/kg	32000	25000	14000	69000
Cation Exchange Capacity	1	cmolc/kg	24	31	25	26
Iron	1	mg/kg	30000	33000	25000	31000
Magnesium	10	mg/kg	4300	5900	4900	5900
Manganese	1	mg/kg	560	560	520	730
Phosphorus	1	mg/kg	110	84	170	280
% Moisture	1	%	4.3	7.7	5.6	4.6
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS/SW04	SS/SW05	SS/SW07	SS/SW08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026450	L22-Ap0026451	L22-Ap0026452	L22-Ap0026453
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	< 10	< 10	< 10
Conductivity	0.01	mS/cm	0.06	0.07	0.05	0.10
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	13	14	13	23
Exchangeable Magnesium	0.2	cmolc/kg	0.7	1.0	0.8	3.5
Exchangeable Potassium	0.05	cmolc/kg	< 0.2	< 0.2	< 0.2	0.75
Exchangeable Sodium	0.2	cmolc/kg	< 0.2	< 0.2	< 0.2	< 0.2
Nitrate-N	1	mg/kg	< 1	< 1	< 1	6.9
NOx-N	1	mg/kg	< 1	< 1	< 1	7.4
pH	0.1	pH Units	9.2	9.2	9.2	8.8
Sulfate	10	mg/kg	< 10	< 10	< 10	< 10
Total Kjeldahl Nitrogen	10	mg/kg	28	14	14	320
Total Nitrogen	10	mg/kg	28	14	14	330
Calcium	10	mg/kg	9600	9400	8100	39000
Cation Exchange Capacity	1	cmolc/kg	14	15	14	27
Iron	1	mg/kg	19000	8900	20000	31000
Magnesium	10	mg/kg	2600	1800	3500	5200
Manganese	1	mg/kg	650	290	850	960
Phosphorus	1	mg/kg	73	61	60	130

Client Sample ID			SS/SW04	SS/SW05	SS/SW07	SS/SW08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026450	L22-Ap0026451	L22-Ap0026452	L22-Ap0026453
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit				
% Moisture	1	%	< 1	< 1	< 1	7.0
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS207	SS208	DUP3
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0026454	L22-Ap0026455	L22-Ap0026456
Date Sampled			Mar 30, 2022	Mar 30, 2022	Mar 30, 2022
Test/Reference	LOR	Unit			
Chloride	10	mg/kg	4500	15	< 10
Conductivity	0.01	mS/cm	< 0.01	0.04	0.10
Exchangeable Acidity	0.1	cmolc/kg	< 0.1	< 0.1	< 0.1
Exchangeable Calcium	0.2	cmolc/kg	5.6	4.1	25
Exchangeable Magnesium	0.2	cmolc/kg	8.2	3.3	5.5
Exchangeable Potassium	0.05	cmolc/kg	0.56	0.74	1.3
Exchangeable Sodium	0.2	cmolc/kg	17	< 0.2	0.2
Nitrate-N	1	mg/kg	8.7	14	11
NOx-N	1	mg/kg	8.8	14	11
pH	0.1	pH Units	7.2	6.9	8.9
Sulfate	10	mg/kg	400	11	< 10
Total Kjeldahl Nitrogen	10	mg/kg	270	730	450
Total Nitrogen	10	mg/kg	280	740	460
Calcium	10	mg/kg	890	1200	25000
Cation Exchange Capacity	1	cmolc/kg	31	8.1	32
Iron	1	mg/kg	41000	42000	33000
Magnesium	10	mg/kg	4400	3900	5900
Manganese	1	mg/kg	1100	660	550
Phosphorus	1	mg/kg	130	130	95
% Moisture	1	%	10	6.0	6.7
Particle Size Distribution			see attached	see attached	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Welshpool	Apr 12, 2022	14 Day
- Method: ARL306 - Chloride in Soil and Sediment by Discrete Analyser			
Conductivity	Welshpool	Apr 12, 2022	7 Day
- Method: ARL140 - Conductivity in Soil and Biosolid			
Nitrate-N	Welshpool	Apr 12, 2022	7 Days
- Method: ARL314 - NOx in Soil and Sediment by Discrete Analyser			
pH	Welshpool	Apr 12, 2022	7 Days
- Method: ARL138 - pH in Soil and Biosolid			
Sulfate	Welshpool	Apr 12, 2022	28 Days
- Method: ARL302 - Sulfate in Soil and Sediment by Discrete Analyser			
Calcium	Welshpool	Apr 12, 2022	180 Days
- Method: ARL030 - Metals in Soil and Sediment by AAS			
Iron	Welshpool	Apr 12, 2022	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Magnesium	Welshpool	Apr 12, 2022	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Manganese	Welshpool	Apr 12, 2022	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Phosphorus	Welshpool	Apr 12, 2022	7 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Exchangeable Acidity	Welshpool	Apr 12, 2022	28 Days
- Method: ARL212 - Exchangeable Acidity, Al3+ and H+			
Exchangeable Calcium	Welshpool	Apr 12, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
Exchangeable Magnesium	Welshpool	Apr 12, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
Exchangeable Potassium	Welshpool	Apr 12, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
Exchangeable Sodium	Welshpool	Apr 12, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
Cation Exchange Capacity	Welshpool	Apr 12, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
NOx-N	Welshpool	Apr 12, 2022	7 Days
- Method: ARL314 - NOx in Soil and Sediment by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Apr 12, 2022	7 Days
- Method: ARL118 - Total Phosphorus and TKN in Soil and Biosolids			
Total Nitrogen	Welshpool	Apr 12, 2022	7 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
% Moisture	Welshpool	Apr 12, 2022	14 Days
- Method: ARL135 Moisture in Solids			

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Company Name: LWC Management Pty Ltd
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Project Name:
Project ID: W-AO-04

Order No.:
Report #: 879589
Phone: 08 8271 5255
Fax:

Received: Apr 8, 2022 12:16 PM
Due: Apr 21, 2022
Priority: 7 Day
Contact Name: Riley Martin

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Calcium	Chloride	Conductivity	Iron	Magnesium	Manganese	Nitrate-N	Particle Size Distribution	pH	Phosphorus	Sulfate	Moisture Set	Cation Exchange Capacity	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	SS202	Mar 29, 2022		Soil	L22-Ap0026414	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SS203	Mar 29, 2022		Soil	L22-Ap0026415	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SS209	Mar 29, 2022		Soil	L22-Ap0026416	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SS212	Mar 29, 2022		Soil	L22-Ap0026417	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SS215	Mar 29, 2022		Soil	L22-Ap0026418	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	SS216	Mar 29, 2022		Soil	L22-	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Sample Detail						Calcium	Chloride	Conductivity	Iron	Magnesium	Manganese	Nitrate-N	Particle Size Distribution	pH	Phosphorus	Sulfate	Moisture Set	Cation Exchange Capacity	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
					Ap0026419														
7	SS119	Mar 29, 2022		Soil	L22-Ap0026420	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	SS102	Mar 30, 2022		Soil	L22-Ap0026421	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	SS213	Mar 30, 2022		Soil	L22-Ap0026422	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	SS211	Mar 30, 2022		Soil	L22-Ap0026423	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11	SS214	Mar 30, 2022		Soil	L22-Ap0026424	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	SS111	Mar 30, 2022		Soil	L22-Ap0026425	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Sample Detail						Calcium	Chloride	Conductivity	Iron	Magnesium	Manganese	Nitrate-N	Particle Size Distribution	pH	Phosphorus	Sulfate	Moisture Set	Cation Exchange Capacity	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
13	SS105	Mar 30, 2022		Soil	L22-Ap0026426	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	SS101	Mar 30, 2022		Soil	L22-Ap0026427	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	SS109	Mar 30, 2022		Soil	L22-Ap0026428	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16	SS113	Mar 30, 2022		Soil	L22-Ap0026429	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	SS103	Mar 30, 2022		Soil	L22-Ap0026430	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	SS112	Mar 30, 2022		Soil	L22-Ap0026431	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19	SS108	Mar 30, 2022		Soil	L22-	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Sample Detail						Calcium	Chloride	Conductivity	Iron	Magnesium	Manganese	Nitrate-N	Particle Size Distribution	pH	Phosphorus	Sulfate	Moisture Set	Cation Exchange Capacity	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
					Ap0026432														
20	SS110	Mar 30, 2022		Soil	L22-Ap0026433	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	SS104	Mar 30, 2022		Soil	L22-Ap0026434	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22	SS107	Mar 30, 2022		Soil	L22-Ap0026435	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23	SS205	Mar 30, 2022		Soil	L22-Ap0026436	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24	SS210	Mar 30, 2022		Soil	L22-Ap0026437	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25	SS217	Mar 30, 2022		Soil	L22-Ap0026438	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name:
Project ID: W-AO-04

Order No.:
Report #: 879589
Phone: 08 8271 5255
Fax:

Received: Apr 8, 2022 12:16 PM
Due: Apr 21, 2022
Priority: 7 Day
Contact Name: Riley Martin

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Calcium	Chloride	Conductivity	Iron	Magnesium	Manganese	Nitrate-N	Particle Size Distribution	pH	Phosphorus	Sulfate	Moisture Set	Cation Exchange Capacity	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
26	DUP1	Mar 30, 2022		Soil	L22-Ap0026439	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27	DUP2	Mar 30, 2022		Soil	L22-Ap0026440	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28	SS201	Mar 30, 2022		Soil	L22-Ap0026441	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29	SS204	Mar 30, 2022		Soil	L22-Ap0026442	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30	SS206	Mar 30, 2022		Soil	L22-Ap0026443	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31	SS116	Mar 30, 2022		Soil	L22-Ap0026444	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32	SS121	Mar 30, 2022		Soil	L22-	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
					Ap0026445														
33	SS120	Mar 30, 2022		Soil	L22-Ap0026446	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34	SS117	Mar 30, 2022		Soil	L22-Ap0026447	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35	SS115	Mar 30, 2022		Soil	L22-Ap0026448	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36	SS118	Mar 30, 2022		Soil	L22-Ap0026449	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37	SS/SW04	Mar 30, 2022		Soil	L22-Ap0026450	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38	SS/SW05	Mar 30, 2022		Soil	L22-Ap0026451	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
39	SS/SW07	Mar 30, 2022		Soil	L22-Ap0026452	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40	SS/SW08	Mar 30, 2022		Soil	L22-Ap0026453	X	X	X	X	X	X	X	X	X	X	X	X	X	X
41	SS207	Mar 30, 2022		Soil	L22-Ap0026454	X	X	X	X	X	X	X	X	X	X	X	X	X	X
42	SS208	Mar 30, 2022		Soil	L22-Ap0026455	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43	DUP3	Mar 30, 2022		Soil	L22-Ap0026456	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						43	43	43	43	43	43	43	43	43	43	43	43	43	43

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Conductivity	mS/cm	< 0.01			0.01	Pass	
Nitrate-N	mg/kg	< 1			1	Pass	
NOx-N	mg/kg	< 1			1	Pass	
Sulfate	mg/kg	< 10			10	Pass	
Total Kjeldahl Nitrogen	mg/kg	< 10			10	Pass	
Calcium	mg/kg	< 10			10	Pass	
Iron	mg/kg	< 1			1	Pass	
Magnesium	mg/kg	< 10			10	Pass	
Manganese	mg/kg	< 1			1	Pass	
Phosphorus	mg/kg	< 1			1	Pass	
LCS - % Recovery							
Calcium	%	92			80-120	Pass	
Iron	%	100			80-120	Pass	
Magnesium	%	100			80-120	Pass	
Manganese	%	96			80-120	Pass	
Phosphorus	%	105			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity	L22-Ap0026414	CP	mS/cm	0.12	0.12	2.8	30%	Pass	
Nitrate-N	L22-Ap0026414	CP	mg/kg	3.5	3.2	8.0	30%	Pass	
NOx-N	L22-Ap0026414	CP	mg/kg	4.2	3.9	8.0	20%	Pass	
pH	L22-Ap0026414	CP	pH Units	9.0	9.0	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Calcium	L22-Ap0026415	CP	mg/kg	20000	20000	1.0	20%	Pass	
Iron	L22-Ap0026415	CP	mg/kg	48000	47000	2.0	20%	Pass	
Magnesium	L22-Ap0026415	CP	mg/kg	7500	7500	1.0	20%	Pass	
Manganese	L22-Ap0026415	CP	mg/kg	1000	950	9.0	20%	Pass	
Phosphorus	L22-Ap0026415	CP	mg/kg	120	110	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen	L22-Ap0026417	CP	mg/kg	430	430	<1	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L22-Ap0026418	CP	%	3.9	3.7	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L22-Ap0026424	CP	mg/kg	1400	1300	6.0	20%	Pass	
Conductivity	L22-Ap0026424	CP	mS/cm	1.0	0.96	7.9	30%	Pass	
Nitrate-N	L22-Ap0026424	CP	mg/kg	5.3	5.0	6.0	30%	Pass	
NOx-N	L22-Ap0026424	CP	mg/kg	5.8	5.6	4.0	20%	Pass	
pH	L22-Ap0026424	CP	pH Units	8.4	8.4	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Calcium	L22-Ap0026425	CP	mg/kg	28000	26000	6.0	20%	Pass	
Iron	L22-Ap0026425	CP	mg/kg	46000	49000	7.0	20%	Pass	
Magnesium	L22-Ap0026425	CP	mg/kg	9000	9000	1.0	20%	Pass	
Phosphorus	L22-Ap0026425	CP	mg/kg	110	110	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen	L22-Ap0026427	CP	mg/kg	170	180	6.0	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L22-Ap0026428	CP	%	11	11	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L22-Ap0026434	CP	mg/kg	< 10	< 10	<1	20%	Pass	
Conductivity	L22-Ap0026434	CP	mS/cm	0.02	0.02	1.2	30%	Pass	
Nitrate-N	L22-Ap0026434	CP	mg/kg	2.4	2.5	3.0	30%	Pass	
NOx-N	L22-Ap0026434	CP	mg/kg	2.5	2.6	2.0	20%	Pass	
pH	L22-Ap0026434	CP	pH Units	8.0	8.0	<1	30%	Pass	
Sulfate	L22-Ap0026434	CP	mg/kg	< 10	< 10	<1	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Iron	L22-Ap0026435	CP	mg/kg	38000	41000	7.0	20%	Pass	
Magnesium	L22-Ap0026435	CP	mg/kg	7700	8700	12	20%	Pass	
Phosphorus	L22-Ap0026435	CP	mg/kg	160	140	13	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen	L22-Ap0026437	CP	mg/kg	220	220	<1	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L22-Ap0026438	CP	%	20	20	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L22-Ap0026444	CP	mg/kg	100	86	16	20%	Pass	
Conductivity	L22-Ap0026444	CP	mS/cm	0.21	0.18	15	30%	Pass	
pH	L22-Ap0026444	CP	pH Units	9.3	9.3	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Calcium	L22-Ap0026445	CP	mg/kg	8100	5100	45	20%	Fail	Q15
Magnesium	L22-Ap0026445	CP	mg/kg	2200	2000	10	20%	Pass	
Manganese	L22-Ap0026445	CP	mg/kg	480	450	7.0	20%	Pass	
Phosphorus	L22-Ap0026445	CP	mg/kg	50	52	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen	L22-Ap0026447	CP	mg/kg	550	540	2.0	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L22-Ap0026454	CP	mg/kg	4500	5600	20	20%	Pass	
Conductivity	L22-Ap0026454	CP	mS/cm	< 0.01	< 0.01	<1	30%	Pass	
Nitrate-N	L22-Ap0026454	CP	mg/kg	8.7	8.5	2.0	30%	Pass	
NOx-N	L22-Ap0026454	CP	mg/kg	8.8	8.7	1.0	20%	Pass	
pH	L22-Ap0026454	CP	pH Units	7.2	7.1	<1	30%	Pass	
Sulfate	L22-Ap0026454	CP	mg/kg	400	330	20	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Iron	L22-Ap0026455	CP	mg/kg	42000	42000	1.0	20%	Pass	
Magnesium	L22-Ap0026455	CP	mg/kg	3900	4300	10	20%	Pass	
Manganese	L22-Ap0026455	CP	mg/kg	660	820	22	20%	Fail	Q15
Phosphorus	L22-Ap0026455	CP	mg/kg	130	120	6.0	30%	Pass	

Comments

Total Organic Carbon analysed by: Australian Precision Ag Laboratory, report reference 94156

Particle size distribution analysed by: Microanalysis, NATA accreditation no. 20283, report reference 22_0600

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Robert Johnston	Analytical Services Manager
Maxine Saw	Senior Analyst-Inorganic
Sam Becker	Senior Analyst-Inorganic
Sean Sangster	Senior Analyst-Metal
Sean Sangster	Senior Analyst-Sample Properties



Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Riley Martin
Project name:	Not provided
Project ID:	W-AO-04
Turnaround time:	7 Day
Date/Time received	Apr 8, 2022 12:16 PM
Eurofins reference	879589

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Robert Johnston on phone : or by email: RobertJohnston@eurofins.com

Results will be delivered electronically via email to Riley Martin - rmartin@lwconsulting.com.au.

Global Leader - Results you can trust

ARL Samples

From: Riley Martin <RMartin@lwconsulting.com.au>
Sent: Tuesday, 12 April 2022 07:56
To: ARL Samples
Subject: RE: Eurofins Sample Receipt Advice - Report 877251 : Site W-AO-3

Hi Ryan - Would we be able to get these on a separate report, under job code W-AO-04 please?

From: ARL Samples <samples@arlgroup.com.au>
Sent: Monday, 11 April 2022 3:28 PM
To: Riley Martin <RMartin@lwconsulting.com.au>
Subject: RE: Eurofins Sample Receipt Advice - Report 877251 : Site W-AO-3

No problem at all Riley,

We'll get those sorted. Would you prefer the original report to be pushed back a bit and the results added to that? Or should we do the soils as a separate report?

Ryan Seaton | Logistics & IT Manager | Eurofins|ARL|Promicro
Phone. +61 8 6253 4444 | Fax: +61 8 6253 4440
Email. it@arlgroup.com.au
Address. 46-48 Banksia Road, WELSHPOOL, WA, 6106

eurofins

Eurofins acquires ARL Laboratory Group in WA

https://www.eurofins.com.au/environmental-testing/company/news/environote-1109-eurofins-acquires-arl-laboratory-group-in-wa/

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From: Riley Martin <RMartin@lwconsulting.com.au>
Sent: Friday, 8 April 2022 12:16 PM
To: ARL Samples <samples@arlgroup.com.au>
Subject: FW: Eurofins Sample Receipt Advice - Report 877251 : Site W-AO-3

Hi Ryan,

Am I able to have all soil samples for this batch analysed for the following please?

- Particle size analysis (laser diffraction method)
- Total organic carbon
- Cation exchange capacity
- Total chloride (1:5 extract)
- Water soluble sulfate (1:5 extract)
- pH and EC of the 1:5 extract

- total nitrogen, nitrate and Kjeldahl nitrogen
- Total phosphorus
- Fe, Mn, Ca and Mg

Regards,

Riley Martin | Environmental Scientist

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From: Karen Mackenzie <kmackenzie@lwconsulting.com.au>
Sent: Tuesday, 5 April 2022 8:20 PM
To: Riley Martin <RMartin@lwconsulting.com.au>; Alistair Vaughan <avaughan@lwconsulting.com.au>; Vanessa Dechellis <vdechellis@lwconsulting.com.au>
Subject: Fwd: Eurofins Sample Receipt Advice - Report 877251 : Site W-AO-3

Sent from my iPhone

Begin forwarded message:

> **From:** EnviroSampleWA@eurofins.com
> **Date:** 5 April 2022 at 5:02:10 pm AWST
> **To:** Karen Mackenzie <kmackenzie@lwconsulting.com.au>
> **Subject: Eurofins Sample Receipt Advice - Report 877251 : Site W-AO-3**
>
> Extra samples SS207, SS208 and DUP3. Samples MBH010_ 009 and DUP1 have one bottle missing as per the no. of bottles. Please advise.
>
> Dear Valued Client,
>
> Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your

Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

View our latest EnviroNotes
How did we do? Provide your feedback here

LWC WA Pty Ltd
Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

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.

Attention: **Riley Martin**

Report **882083-S**
Project name
Project ID W-AO-3
Received Date Apr 21, 2022

Client Sample ID			**SS106**	**SS114**	**SS/SW12**	**SS/SW03**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Ap0045621**	**L22-Ap0045622**	**L22-Ap0045623**	**L22-Ap0045624**
Date Sampled			**Apr 04, 2022**	**Apr 04, 2022**	**Apr 04, 2022**	**Apr 04, 2022**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	37000	12	31000	< 10
Conductivity	0.01	mS/cm	15	0.06	15	0.05
Exchangeable Acidity	0.1	cmolc/kg	0.7	0.5	0.5	0.5
Exchangeable Calcium	0.2	cmolc/kg	32	13	31	14
Exchangeable Magnesium	0.2	cmolc/kg	47	1.9	33	0.7
Exchangeable Potassium	0.05	cmolc/kg	3.9	0.72	2.8	0.20
Exchangeable Sodium	0.2	cmolc/kg	12	0.3	12	< 0.2
Nitrate-N	1	mg/kg	< 1	3.2	1.2	1.1
NOx-N	1	mg/kg	< 1	3.3	1.4	1.2
pH	0.1	pH Units	8.4	8.3	8.7	8.9
Sulfate	10	mg/kg	4100	< 10	11000	< 10
Total Kjeldahl Nitrogen	10	mg/kg	160	450	1100	34
Total Nitrogen	10	mg/kg	160	450	1100	35
Calcium	10	mg/kg	120000	4900	48000	20000
Cation Exchange Capacity	1	cmolc/kg	96	16	79	15
Iron	1	mg/kg	24000	38000	44000	14000
Magnesium	10	mg/kg	30000	9500	80000	3600
Manganese	1	mg/kg	210	690	660	670
Phosphorus	1	mg/kg	260	160	500	100
% Moisture	1	%	23	2.5	22	< 1
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			**SS/MBH06**	**SS/MBH003**	**SS/MBH020**	**SS/MBH017**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L22-Ap0045625**	**L22-Ap0045626**	**L22-Ap0045627**	**L22-Ap0045628**
Date Sampled			**Apr 04, 2022**	**Apr 04, 2022**	**Apr 04, 2022**	**Apr 04, 2022**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	81	< 10	3400	10
Conductivity	0.01	mS/cm	0.09	0.02	2.2	0.08
Exchangeable Acidity	0.1	cmolc/kg	0.3	0.2	0.3	0.3
Exchangeable Calcium	0.2	cmolc/kg	8.6	1.7	11	28
Exchangeable Magnesium	0.2	cmolc/kg	5.0	0.7	2.8	4.9

Client Sample ID			SS/MBH06	SS/MBH003	SS/MBH020	SS/MBH017
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0045625	L22-Ap0045626	L22-Ap0045627	L22-Ap0045628
Date Sampled			Apr 04, 2022	Apr 04, 2022	Apr 04, 2022	Apr 04, 2022
Test/Reference	LOR	Unit				
Exchangeable Potassium	0.05	cmolc/kg	0.84	0.41	0.51	1.3
Exchangeable Sodium	0.2	cmolc/kg	0.3	< 0.2	1.8	0.3
Nitrate-N	1	mg/kg	2.7	2.2	4.2	5.3
NOx-N	1	mg/kg	2.8	2.2	4.4	5.9
pH	0.1	pH Units	6.9	7.0	8.9	8.6
Sulfate	10	mg/kg	220	160	330	180
Total Kjeldahl Nitrogen	10	mg/kg	340	140	180	410
Total Nitrogen	10	mg/kg	340	140	180	420
Calcium	10	mg/kg	3400	1000	5600	21000
Cation Exchange Capacity	1	cmolc/kg	15	3.0	16	35
Iron	1	mg/kg	63000	13000	27000	43000
Magnesium	10	mg/kg	2600	1900	5800	8700
Manganese	1	mg/kg	890	140	390	760
Phosphorus	1	mg/kg	76	160	91	95
% Moisture	1	%	5.1	2.6	2.0	6.9
Particle Size Distribution			see attached	see attached	see attached	see attached

Client Sample ID			SS/MBH001	SS/MBH008	SS/MBH019	SS/SW09
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L22-Ap0045629	L22-Ap0045630	L22-Ap0045631	L22-Ap0045632
Date Sampled			Apr 04, 2022	Apr 04, 2022	Apr 04, 2022	Apr 04, 2022
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	< 10	1400	< 10
Conductivity	0.01	mS/cm	0.05	0.06	1.1	0.03
Exchangeable Acidity	0.1	cmolc/kg	0.2	0.3	0.2	0.2
Exchangeable Calcium	0.2	cmolc/kg	8.9	18	3.0	2.8
Exchangeable Magnesium	0.2	cmolc/kg	5.6	1.9	2.2	1.5
Exchangeable Potassium	0.05	cmolc/kg	1.2	0.30	0.92	0.30
Exchangeable Sodium	0.2	cmolc/kg	< 0.2	< 0.2	0.9	< 0.2
Nitrate-N	1	mg/kg	7.4	3.2	2.3	1.7
NOx-N	1	mg/kg	7.6	3.2	2.3	1.8
pH	0.1	pH Units	7.8	9.0	9.1	7.1
Sulfate	10	mg/kg	270	88	770	44
Total Kjeldahl Nitrogen	10	mg/kg	610	130	180	94
Total Nitrogen	10	mg/kg	620	130	180	96
Calcium	10	mg/kg	3200	94000	2100	1600
Cation Exchange Capacity	1	cmolc/kg	16	21	7.2	4.8
Iron	1	mg/kg	41000	11000	30000	50000
Magnesium	10	mg/kg	5600	5600	3000	9000
Manganese	1	mg/kg	830	150	500	660
Phosphorus	1	mg/kg	110	370	96	160
% Moisture	1	%	4.7	< 1	2.7	< 1
Particle Size Distribution			see attached	see attached	see attached	see attached

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Welshpool	Apr 22, 2022	14 Day
- Method: ARL306 - Chloride in Soil and Sediment by Discrete Analyser			
Conductivity	Welshpool	Apr 22, 2022	7 Day
- Method: ARL140 - Conductivity in Soil and Biosolid			
Nitrate-N	Welshpool	Apr 22, 2022	7 Days
- Method: ARL314 - NOx in Soil and Sediment by Discrete Analyser			
pH	Welshpool	Apr 22, 2022	7 Days
- Method: ARL138 - pH in Soil and Biosolid			
Sulfate	Welshpool	Apr 22, 2022	28 Days
- Method: ARL302 - Sulfate in Soil and Sediment by Discrete Analyser			
Calcium	Welshpool	Apr 22, 2022	180 Days
- Method: ARL030 - Metals in Soil and Sediment by AAS			
Iron	Welshpool	Apr 22, 2022	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Magnesium	Welshpool	Apr 22, 2022	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Manganese	Welshpool	Apr 22, 2022	180 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Phosphorus	Welshpool	Apr 22, 2022	7 Days
- Method: ARL401/403 - Metals in Soil and Sediment by ICPOES/MS			
Exchangeable Acidity	Welshpool	Apr 22, 2022	28 Days
- Method: ARL212 - Exchangeable Acidity, Al3+ and H+			
Exchangeable Calcium	Welshpool	Apr 22, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
Exchangeable Magnesium	Welshpool	Apr 22, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
Exchangeable Potassium	Welshpool	Apr 22, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
Exchangeable Sodium	Welshpool	Apr 22, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
Cation Exchange Capacity	Welshpool	Apr 22, 2022	28 Days
- Method: ARL213 - Total Exchangeable Bases and Effective Cation Exchange Capacity			
NOx-N	Welshpool	Apr 22, 2022	7 Days
- Method: ARL314 - NOx in Soil and Sediment by Discrete Analyser			
Total Kjeldahl Nitrogen	Welshpool	Apr 22, 2022	7 Days
- Method: ARL118 - Total Phosphorus and TKN in Soil and Biosolids			
Total Nitrogen	Welshpool	Apr 22, 2022	7 Days
- Method: ARL No. 330 - Persulfate Method for Simultaneous Determination of TN & TP			
% Moisture	Welshpool	Apr 22, 2022	14 Days
- Method: ARL135 Moisture in Solids			

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IANZ # 1290

Company Name: LWC Management Pty Ltd
Address: Core Innovation Hub, Level 7, 191 St Georges Terrace
Perth
WA 6000

Project Name:
Project ID: W-AO-3

Order No.:
Report #: 882083
Phone: 08 8271 5255
Fax:

Received: Apr 21, 2022 3:03 PM
Due: May 3, 2022
Priority: 7 Day
Contact Name: Riley Martin

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Calcium	Chloride	Conductivity	Iron	Magnesium	Manganese	Nitrate-N	Particle Size Distribution	pH	Phosphorus	Sulfate	Moisture Set	Cation Exchange Capacity	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	SS106	Apr 04, 2022		Soil	L22-Ap0045621	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SS114	Apr 04, 2022		Soil	L22-Ap0045622	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SS/SW12	Apr 04, 2022		Soil	L22-Ap0045623	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SS/SW03	Apr 04, 2022		Soil	L22-Ap0045624	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SS/MBH06	Apr 04, 2022		Soil	L22-Ap0045625	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	SS/MBH003	Apr 04, 2022		Soil	L22-	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Eurofins Analytical Services Manager : Robert Johnston

Sample Detail						Calcium	Chloride	Conductivity	Iron	Magnesium	Manganese	Nitrate-N	Particle Size Distribution	pH	Phosphorus	Sulfate	Moisture Set	Cation Exchange Capacity	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254																			
Sydney Laboratory - NATA # 1261 Site # 18217																			
Brisbane Laboratory - NATA # 1261 Site # 20794																			
Mayfield Laboratory - NATA # 1261 Site # 25079																			
External Laboratory													X						
					Ap0045626														
7	SS/MBH020	Apr 04, 2022		Soil	L22-Ap0045627	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	SS/MBH017	Apr 04, 2022		Soil	L22-Ap0045628	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	SS/MBH001	Apr 04, 2022		Soil	L22-Ap0045629	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	SS/MBH008	Apr 04, 2022		Soil	L22-Ap0045630	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11	SS/MBH019	Apr 04, 2022		Soil	L22-Ap0045631	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	SS/SW09	Apr 04, 2022		Soil	L22-Ap0045632	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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Company Name: LWC Management Pty Ltd
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Project Name:
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Phone: 08 8271 5255
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Received: Apr 21, 2022 3:03 PM
Due: May 3, 2022
Priority: 7 Day
Contact Name: Riley Martin

Eurofins Analytical Services Manager : Robert Johnston

Sample Detail	Calcium	Chloride	Conductivity	Iron	Magnesium	Manganese	Nitrate-N	Particle Size Distribution	pH	Phosphorus	Sulfate	Moisture Set	Cation Exchange Capacity	Total Nitrogen
Perth Laboratory - NATA # 2377 Site # 2370	X	X	X	X	X	X	X		X	X	X	X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254														
Sydney Laboratory - NATA # 1261 Site # 18217														
Brisbane Laboratory - NATA # 1261 Site # 20794														
Mayfield Laboratory - NATA # 1261 Site # 25079														
External Laboratory								X						
Test Counts	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Conductivity	mS/cm	< 0.01			0.01	Pass	
Nitrate-N	mg/kg	< 1			1	Pass	
NOx-N	mg/kg	< 1			1	Pass	
Sulfate	mg/kg	< 10			10	Pass	
Total Kjeldahl Nitrogen	mg/kg	< 10			10	Pass	
Calcium	mg/kg	< 10			10	Pass	
Iron	mg/kg	< 1			1	Pass	
Magnesium	mg/kg	< 10			10	Pass	
Manganese	mg/kg	< 1			1	Pass	
Phosphorus	mg/kg	< 1			1	Pass	
LCS - % Recovery							
Calcium	%	81			80-120	Pass	
Iron	%	94			80-120	Pass	
Magnesium	%	103			80-120	Pass	
Manganese	%	101			80-120	Pass	
Phosphorus	%	106			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Manganese	L22-My0008868	NCP	%	115			80-120	Pass	
Phosphorus	L22-My0008868	NCP	%	111			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	L22-Ap0045621	CP	mg/kg	37000	37000	<1	20%	Pass	
Conductivity	L22-Ap0045621	CP	mS/cm	15	15	<1	30%	Pass	
pH	L22-Ap0045621	CP	pH Units	8.4	8.5	1.2	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen	L22-Ap0045622	CP	mg/kg	450	440	2.0	20%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Calcium	L22-Ap0045628	CP	mg/kg	21000	25000	15	20%	Pass	
Iron	L22-Ap0045628	CP	mg/kg	43000	43000	<1	20%	Pass	
Magnesium	L22-Ap0045628	CP	mg/kg	8700	8400	3.0	20%	Pass	
Manganese	L22-Ap0045628	CP	mg/kg	760	740	3.0	20%	Pass	
Phosphorus	L22-Ap0045628	CP	mg/kg	95	96	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity	L22-Ap0045630	CP	mS/cm	0.06	0.06	<1	30%	Pass	
Nitrate-N	L22-Ap0045630	CP	mg/kg	3.2	2.8	15	30%	Pass	
NOx-N	L22-Ap0045630	CP	mg/kg	3.2	2.8	15	20%	Pass	
pH	L22-Ap0045630	CP	pH Units	9.0	8.6	4.8	30%	Pass	
% Moisture	L22-Ap0045630	CP	%	< 1	< 1	<1	30%	Pass	

Comments

Total Organic Carbon analysed by: Australian Precision Ag Laboratory, report reference 29763

Particle size distribution analysed by: Microanalysis, NATA accreditation no. 20283, report reference 22_0637

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Robert Johnston	Analytical Services Manager
Sam Becker	Senior Analyst-Inorganic
Sean Sangster	Senior Analyst-Metal
Sean Sangster	Senior Analyst-Sample Properties

Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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eurofins | ARL

www.eurofins.com.au EnviroSales@eurofins.com

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Phone : +61 8 6253 4444
NATA # 2377 Site # 2370

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ABN: 50 005 085 521

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NATA # 1261 Site # 1254

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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	LWC Management Pty Ltd
Contact name:	Riley Martin
Project name:	Not provided
Project ID:	W-AO-3
Turnaround time:	7 Day
Date/Time received	Apr 21, 2022 3:03 PM
Eurofins reference	882083

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✗	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Robert Johnston on phone : or by email: RobertJohnston@eurofins.com

Results will be delivered electronically via email to Riley Martin - rmartin@lwconsulting.com.au.

Global Leader - Results you can trust

ARL Samples

From: Riley Martin <RMartin@lwconsulting.com.au>
Sent: Thursday, 21 April 2022 3:03 PM
To: ARL Samples
Cc: Robert Johnston; Karen Mackenzie; Stephanie Wilcock
Subject: RE: W-AO Data

Yep, that's the one! Am I able to have all soil samples from this batch analysed for the following please?

- Particle size analysis (laser diffraction method)
- Total organic carbon
- Cation exchange capacity
- Total chloride (1:5 extract)
- Water soluble sulfate (1:5 extract)
- pH and EC of the 1:5 extract
- Total nitrogen, nitrate and Kjeldahl nitrogen
- Total phosphorus
- Fe, Mn, Ca and Mg

Thanks Ryan!

Regards,

Riley Martin | Environmental Scientist

Land & Water Consulting
4-8 Goodwood Road, WAYVILLE, SA 5034
P: +61 8 8271 5255|M: +61 475 047 509
rmartin@lwconsulting.com.au | www.lwconsulting.com.au

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From: ARL Samples <samples@arlgroup.com.au>
Sent: Thursday, 21 April 2022 4:32 PM

To: Riley Martin <RMartin@lwconsulting.com.au>; ARL Samples <samples@arlgroup.com.au>
Cc: Robert Johnston <RobertJohnston@eurofins.com>; Karen Mackenzie <kmackenzie@lwconsulting.com.au>; Stephanie Wilcock <swilcock@lwconsulting.com.au>
Subject: RE: W-AO Data

Think I've found the one your after Riley, 878084.

Have just sent through the SRN now.

Ryan Seaton | Logistics & IT Manager | Eurofins|ARL|Promicro
Phone. +61 8 6253 4444 | Fax: +61 8 6253 4440
Email. it@arlgroup.com.au
Address. 46-48 Banksia Road, WELSHPOOL, WA, 6106

eurofins

Eurofins acquires ARL Laboratory Group in WA

https://www.eurofins.com.au/environmental-testing/company/news/environote-1109-eurofins-acquires-arl-laboratory-group-in-wa/

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From: Riley Martin <RMartin@lwconsulting.com.au>
Sent: Thursday, 21 April 2022 2:54 PM
To: ARL Samples <samples@arlgroup.com.au>
Cc: Robert Johnston <RobertJohnston@eurofins.com>; Karen Mackenzie <kmackenzie@lwconsulting.com.au>; Stephanie Wilcock <swilcock@lwconsulting.com.au>
Subject: RE: W-AO Data

Hi Ryan

Thanks for that, there was an SRN for another batch rather than the one forwarded to me that I was after – contains waters and approx. 10 soil samples (not 879589 or 877251 – this one's been requested for) – soils were placed on hold originally on the CoC. Are you able to forward that one to me so I can confirm soil analysis for the samples on hold as per below? Steph's on interstate field work at the moment so may be difficult for her to forward to myself soon.

Soils to be analysed for:

- Particle size analysis (laser diffraction method)
- Total organic carbon
- Cation exchange capacity
- Total chloride (1:5 extract)
- Water soluble sulfate (1:5 extract)
- pH and EC of the 1:5 extract
- Total nitrogen, nitrate and Kjeldahl nitrogen
- Total phosphorus
- Fe, Mn, Ca and Mg

Regards,

Riley Martin | Environmental Scientist

Land & Water Consulting
4-8 Goodwood Road, WAYVILLE, SA 5034
P: +61 8 8271 5255|M: +61 475 047 509
rmartin@lwconsulting.com.au | www.lwconsulting.com.au

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From: ARL Samples <samples@arlgroup.com.au>
Sent: Wednesday, 20 April 2022 8:50 AM
To: Riley Martin <RMartin@lwconsulting.com.au>
Cc: Karen Mackenzie <kmackenzie@lwconsulting.com.au>; Stephanie Wilcock <swilcock@lwconsulting.com.au>; Robert Johnston <RobertJohnston@eurofins.com>
Subject: RE: W-AO Data

Morning Riley,

I've just resent all of the SRN's to Stephanie, and the latest to yourself as well. Let me know if you don't receive them.

And no issue's on the reports going to Stephanie also, I've let the person know that is handling the reports going out so she shouldn't be missed.

Ryan Seaton | Logistics & IT Manager | Eurofins|ARL|Promicro
Phone. +61 8 6253 4444 | Fax: +61 8 6253 4440
Email. samples@arlgroup.com.au
Address. 46-48 Banksia Road, WELSHPOOL, WA, 6106

Eurofins acquires ARL Laboratory Group in WA

https://www.eurofins.com.au/environmental-testing/company/news/environote-1109-eurofins-acquires-arl-laboratory-group-in-wa/

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From: Riley Martin <RMartin@lwconsulting.com.au>
Sent: Tuesday, 19 April 2022 11:08 AM
To: ARL Samples <samples@arlgroup.com.au>
Cc: Karen Mackenzie <kmackenzie@lwconsulting.com.au>; Stephanie Wilcock <swilcock@lwconsulting.com.au>; Robert Johnston <RobertJohnston@eurofins.com>
Subject: W-AO Data

Hi Ryan,

Are you able to send all data & SRNs (issued and any to be issued) related to W-AO-03/04/05 from a couple weeks ago to swilcock@lwconsulting.com.au please? – Have a few people on leave so she'll be taking care of it all.

Are you also able to send me the SRN for the last batch received (likely 05-06 April receive date)? Don't believe I've got that one in my inbox.

Thanks 😊

Regards,

Riley Martin | Environmental Scientist

Land & Water Consulting
4-8 Goodwood Road, WAYVILLE, SA 5034
P: +61 8 8271 5255|M: +61 475 047 509
rmartin@lwconsulting.com.au | www.lwconsulting.com.au

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ChemCentre
Scientific Services Division
Report of Examination

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F +61 8 9422 9801
www.chemcentre.wa.gov.au
ABN 40 991 885 705

Purchase Order:
Your Reference:
ChemCentre Reference: 21S1290 R0

Land and Water Consulting
Core Innovation Hub
Level 7, 191 St Georges Terrace
PERTH WA 6000

Attention: Karen Mackenzie

Final Report on 4 samples of soil received on 24/09/2021

LAB ID	Client ID and Description
21S1290 / 001	TP059 - ASS4
21S1290 / 002	TP074 - ASS3
21S1290 / 003	TP055 - ASS3
21S1290 / 004	TP051 - ASS3

Analyte		pHf	pHfox	pHfoxr
Method		iCRS	iCRS	iCRS
Unit				
Lab ID	Client ID			
21S1290/001	TP059 - ASS4	8.9	8.3	XXXX
21S1290/002	TP074 - ASS3	9.1	8.4	XXXX
21S1290/003	TP055 - ASS3	8.9	8.2	XXXX
21S1290/004	TP051 - ASS3	9.1	8.6	XXXX

Analyte	Method	Description
pHf	iCRS	pH field (1:1 extract) with water
pHfox	iCRS	pH field oxidised (1:1 extract) with H2O2
pHfoxr	iCRS	pHfox Soil Reaction Rating

The results apply only to samples as received. This report may only be reproduced in full.

Unless otherwise advised, the samples in this job will be disposed of after a holding period of 30 days from the report date shown below.

Soil Reaction Rating Scale for pH(Fox) Test:

X = Slight Reaction
XX = Moderate Reaction
XXX = High Reaction
XXXX = Vigorous Reaction, gas evolution and heat.



Barry Price
Snr Chemist & Research Officer
Scientific Services Division
29-Sep-2021

Sample Acknowledgement Receipt

PO Box 1250, Bentley Delivery Centre
Bentley WA 6983
T +61 8 9422 9800
F +61 8 9422 9801
www.chemcentre.wa.gov.au
ABN 40 991 885 705

CLIENT DETAILS

Contact	Karen Mackenzie
Client	Land and Water Consulting
Address	Core Innovation Hub Level 7, 191 St Georges Terrace
	PERTH WA 6000
Telephone	+614 4868 2774
Facsimile	
Email	kmackenzie@lwconsulting.com.au
Project	
Client Job Ref.	
CoC No	
PO Number	
Samples	4

LABORATORY DETAILS

Registration # 21S1290

Manager	Barry Price
Laboratory	Inorganic Chemistry Laboratory
Telephone	9422 9953
Facsimile	9422 9998
Email	eclabmanager@chemcentre.wa.gov.au
Registered By	Jeremy Brown
Samples Received	Fri 24/09/2021
Report Due	Mon 11/10/2021
Receipt Print By	Jeremy Brown

SUBMISSION DETAILS

This is to confirm that 4 samples received on 24/09/2021. Results are expected to be ready by Mon 11/10/2021.
Please quote Registration #21S1290 when making enquiries.

Sample counts by matrix	4 soil	Sample Disposal Type	Dispose
Date documentation received	24/09/2021		

Samples are accepted on the basis that the ChemCentre terms and conditions of analysis are understood and accepted. Samples will be held for one month from date of reporting before disposal or return as marked above.

INVOICING DETAILS

The person submitting the sample is considered to be the client and is responsible for payment. It is not acceptable to ChemCentre for a third party to be made responsible for payment.

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission or before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

Sample Acknowledgement Receipt

PO Box 1250, Bentley Delivery Centre
Bentley WA 6983
T +61 8 9422 9800
F +61 8 9422 9801
www.chemcentre.wa.gov.au
ABN 40 991 885 705

SUMMARY OF ANALYSIS

Lab No	Client ID	Sample preparation									
001	TP059 - ASS4	✓									
002	TP074 - ASS3	✓									
003	TP055 - ASS3	✓									
004	TP051 - ASS3	✓									

This table indicates the testing requested. This is not a report of the results

CHAIN OF CUSTODY FORM

From : Land & Water Consulting
Level 7, 191 St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 2107080

LWC Project No: W-AO

LWC Contact Information:
Contact Name:
K Mackenzie
Contact Email:
laboratoryresults@lwconsulting.com.au
kmackenzie@lwconsulting.com.au
Phone Number:
08 82715255

Project Manager:
Karen Mackenzie
Date Samples Sent:
24-Sep-21
COC Checked by:

Lab ID	Date	Matrix	Sample ID	No. bags	Sample Analysis: Tick required analytes						
					pH f	pHfox					
001 TP059 - ASS4	28/09/2021	soil	TP059 - ASS4	1	✓	✓					
002 TP074 - ASS3	28/09/2021	soil	TP074 - ASS3	1	✓	✓					
003 TP055 - ASS3	28/09/2021	soil	TP055 - ASS3	1	✓	✓					
004 TP051 - ASS3	28/09/2021	soil	TP051 - ASS3	1	✓	✓					
			TOTAL								

Samples Rec'ed 24/9/21 @ 13:30

updated CoC Rec'ed 28/9/21 @ 11:15

Jeremy Brown.

2151290/001 – 004

ADDITIONAL COMMENTS:

ChemCentre
Scientific Services Division
Report of Examination

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Bentley
WA 6102
T +61 8 9422 9800
F +61 8 9422 9801
www.chemcentre.wa.gov.au
ABN 40 991 885 705

Purchase Order: None
Your Reference:
ChemCentre Reference: 21S1518 R0

Land and Water Consulting
Core Innovation Hub
Level 7, 191 St George's Terrace
PERTH WA 6000

Attention: Karen Mackenzie

Final Report on 9 samples of soil received on 11/10/2021

LAB ID	Client ID and Description
21S1518 / 001	TP181 ASS3
21S1518 / 002	TP005 ASS8
21S1518 / 003	TP169 ASS3
21S1518 / 004	TP191 ASS3
21S1518 / 005	TP082 ASS3
21S1518 / 006	TP189/TP089 TBC ASS3
21S1518 / 007	TP085 ASS3
21S1518 / 008	TP087 ASS3
21S1518 / 009	TP036 ASS3

Analyte		pHf	pHfox	pHfoxr
Method		iCRS	iCRS	iCRS
Unit				
Lab ID	Client ID			
21S1518/001	TP181	8.4	9.1	XXXX
21S1518/002	TP005	7.9	9.0	XXXX
21S1518/003	TP169	7.9	8.5	XXXX
21S1518/004	TP191	8.4	8.6	XXXX
21S1518/005	TP082	8.2	8.7	XXXX
21S1518/006	TP189/TP089 TBC	8.3	8.4	XXXX
21S1518/007	TP085	8.6	8.5	XXXX
21S1518/008	TP087	8.2	8.0	XXXX
21S1518/009	TP036	7.9	8.3	XXXX

Analyte	Method	Description
pHf	iCRS	pH field (1:1 extract) with water
pHfox	iCRS	pH field oxidised (1:1 extract) with H2O2
pHfoxr	iCRS	pHfox Soil Reaction Rating

The results apply only to samples as received. This report may only be reproduced in full.

Unless otherwise advised, the samples in this job will be disposed of after a holding period of 30 days from the report date shown below.

Soil Reaction Rating Scale for pH(Fox) Test:

X = Slight Reaction
XX = Moderate Reaction
XXX = High Reaction
XXXX = Vigorous Reaction, gas evolution and heat.



Barry Price
Snr Chemist & Research Officer
Scientific Services Division
18-Oct-2021

Sample Acknowledgement Receipt

PO Box 1250, Bentley Delivery Centre
Bentley WA 6983
T +61 8 9422 9800
F +61 8 9422 9801
www.chemcentre.wa.gov.au
ABN 40 991 885 705

CLIENT DETAILS

Contact	Karen Mackenzie
Client	Land and Water Consulting
Address	Core Innovation Hub Level 7, 191 St George's Terrace PERTH WA 6000
Telephone	+614 4868 2774
Facsimile	
Email	kmackenzie@lwconsulting.com.au
Project	
Client Job Ref.	W-AO
CoC No	
PO Number	None
Samples	9

LABORATORY DETAILS

Registration # 21S1518

Manager	Barry Price
Laboratory	Inorganic Chemistry Laboratory
Telephone	9422 9979
Facsimile	9422 9998
Email	bprice@chemcentre.wa.gov.au
Registered By	Dale Carter
Samples Received	Mon 11/10/2021
Receipt Print By	Dale Carter

SUBMISSION DETAILS

This is to confirm that 9 samples received on 11/10/2021. Please quote Registration #21S1518 when making enquiries.

Sample counts by matrix	9 soil	Sample Disposal Type	Dispose
Date documentation received	11/10/2021		

Samples are accepted on the basis that the ChemCentre terms and conditions of analysis are understood and accepted. Samples will be held for two months from date of reporting before disposal or return as marked above.

INVOICING DETAILS

The person submitting the sample is considered to be the client and is responsible for payment. It is not acceptable to ChemCentre for a third party to be made responsible for payment.

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission or before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

Sample Acknowledgement Receipt

PO Box 1250, Bentley Delivery Centre
Bentley WA 6983
T +61 8 9422 9800
F +61 8 9422 9801
www.chemcentre.wa.gov.au
ABN 40 991 885 705

Sample List

Lab No	Client ID	Sample Description
001	TP181	ASS3
002	TP005	ASS8
003	TP169	ASS3
004	TP191	ASS3
005	TP082	ASS3
006	TP189	ASS3
007	TP085	ASS3
008	TP087	ASS3
009	TP036	ASS3

CHAIN OF CUSTODY

From : Land & Water Consulting
Level 7, Core Hub, 191, St Georges Terrace, Perth WA 6000
ph: (08) 8271 5255 fax: (08) 8357 1307

LWC Land & Water Consulting

LAB Quote Number: 2107080

LWC Project No: W-AO

LWC Contact Information:
Contact Name: K Mackenzie
Contact Email: kmackenzie@lwconsulting.com.au
Phone Number: 08 82715255

Project Manager: Karen Mackenzie

COC Checked by:

	Location ID	Sample number	Date	Depth (m)	Matrix	pHf and pHfox
21S1518/						
001.	TP181	ASS3	10/09/2021	0.00	Soil	1
002.	TP005	ASS8	6/09/2021	2.50	Soil	1
003.	TP169	ASS3	6/09/2021	0.00	Soil	1
004.	TP191	ASS3	1/09/2021	0.00	Soil	1
005.	TP082	ASS3	29/08/2021	0.00	Soil	1
006.	TP189	ASS3	29/08/2021	0.00	Soil	1
007.	TP085	ASS3	29/08/2021	0.00	Soil	1
008.	TP087	ASS3	29/08/2021	0.00	Soil	1
009.	TP036	ASS3	19/08/2021	0.00	Soil	1
					TOTAL	9

RECEIVED
ChemCentre
By: DC
Date: 11/10/21
Time: 12:40
frozen (cold) ambient
Job # 21S1518

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2204125**	Page	: 1 of 8
Client	: **LWC Management Pty Ltd**	Laboratory	: Environmental Division Perth
Contact	: K Mackenzie	Contact	: Kieren Burns
Address	: Suite 3 4-8 Goodwood Road WAYVILLE SOUTH AUSTRALIA 5034	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61881625130
Project	: W-AO-3	Date Samples Received	: 07-Apr-2022 12:50
Order number	: ----	Date Analysis Commenced	: 07-Apr-2022
C-O-C number	: ----	Issue Date	: 19-Apr-2022 22:17
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- TOC conducted by ALS Brisbane, NATA Site No. 818.
- EG020: Metals LOR for sample EP2204125-004 raised due to high TDS content.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	DUP1	DUP2	DUP3	----	----
			Sampling date / time	31-Mar-2022 00:00	31-Mar-2022 00:00	03-Apr-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	EP2204125-001	EP2204125-002	EP2204125-003	--------	--------
				Result	Result	Result	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	9.0	9.1	8.9	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	56	2860	176	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	9.7	10.4	6.7	----	----
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	16.0	----	33.9	----	----
Exchangeable Magnesium	----	0.1	meq/100g	4.3	----	4.2	----	----
Exchangeable Potassium	----	0.1	meq/100g	0.8	----	1.0	----	----
Exchangeable Sodium	----	0.1	meq/100g	0.8	----	0.3	----	----
Cation Exchange Capacity	----	0.1	meq/100g	22.0	----	39.4	----	----
Exchangeable Sodium Percent	----	0.1	%	3.7	----	0.8	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	22.2	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	3.8	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	0.6	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	3.4	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	30.1	----	----	----
Exchangeable Sodium Percent	----	0.1	%	----	11.4	----	----	----
ED040S: Soluble Major Anions								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	110	<10	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	<10	4870	<10	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	50	mg/kg	39500	36000	35000	----	----
Manganese	7439-96-5	5	mg/kg	726	702	404	----	----
Calcium	7440-70-2	50	mg/kg	6950	20200	37700	----	----
Magnesium	7439-95-4	50	mg/kg	6490	8660	5520	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	0.1	0.5	<0.1	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	14797-55-8	0.1	mg/kg	2.3	16.6	3.1	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	DUP1	DUP2	DUP3	----	----
				Sampling date / time	31-Mar-2022 00:00	31-Mar-2022 00:00	03-Apr-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EP2204125-001	EP2204125-002	EP2204125-003	--------	--------
					Result	Result	Result	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg		2.4	17.1	3.1	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	20	mg/kg		370	340	510	----	----
EK062: Total Nitrogen as N (TKN + NOx)									
^ Total Nitrogen as N	----	20	mg/kg		370	360	510	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	2	mg/kg		150	149	106	----	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		0.30	0.36	0.42	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	DUP1S	----	----	----	----
			Sampling date / time	04-Apr-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2204125-004	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.82**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**69300**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**50700**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**87**	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**9320**	----	----	----	----
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	**258**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**258**	----	----	----	----
ED040F: Dissolved Major Anions								
Silicon as SiO2	14464-46-1	0.1	mg/L	**6.9**	----	----	----	----
ED040T: Total Major Anions								
Silicon as SiO2	14464-46-1	0.1	mg/L	**37.7**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**3630**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**24900**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**650**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**1870**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**16000**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**537**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.10	----	----	----	----
Antimony	7440-36-0	0.001	mg/L	<0.010	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.010	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.010	----	----	----	----
Bismuth	7440-69-9	0.001	mg/L	<0.010	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DUP1S	----	----	----	----
				Sampling date / time	04-Apr-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2204125-004	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Cadmium	7440-43-9	0.0001	mg/L		<0.0010	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.010	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.010	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.010	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.010	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.010	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.050	----	----	----	----
Lithium	7439-93-2	0.001	mg/L		**0.257**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.141**	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		**0.012**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.10	----	----	----	----
Silver	7440-22-4	0.001	mg/L		<0.010	----	----	----	----
Strontium	7440-24-6	0.001	mg/L		**10.5**	----	----	----	----
Thorium	7440-29-1	0.001	mg/L		<0.010	----	----	----	----
Titanium	7440-32-6	0.01	mg/L		<0.10	----	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.010	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.10	----	----	----	----
Zirconium	7440-67-7	0.005	mg/L		<0.050	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.50	----	----	----	----
EG020T: Total Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		**5.85**	----	----	----	----
Antimony	7440-36-0	0.001	mg/L		<0.010	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.010	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.010	----	----	----	----
Bismuth	7440-69-9	0.001	mg/L		<0.010	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0010	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.036**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.010	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.010	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.014**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.010	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.052	----	----	----	----
Lithium	7439-93-2	0.001	mg/L		**0.266**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		**0.179**	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		**0.013**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DUP1S	----	----	----	----
				Sampling date / time	04-Apr-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2204125-004	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS - Continued									
Selenium	7782-49-2	0.01	mg/L		<0.10	----	----	----	----
Silver	7440-22-4	0.001	mg/L		<0.010	----	----	----	----
Strontium	7440-24-6	0.001	mg/L		**10.9**	----	----	----	----
Thorium	7440-29-1	0.001	mg/L		<0.010	----	----	----	----
Titanium	7440-32-6	0.01	mg/L		**0.20**	----	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.010	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.10	----	----	----	----
Zirconium	7440-67-7	0.005	mg/L		<0.052	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**8.33**	----	----	----	----
EG051G: Ferrous Iron by Discrete Analyser									
Ferrous Iron	----	0.05	mg/L		**0.10**	----	----	----	----
EG053FG-MS: Dissolved Ferric Iron by ICPMS and DA									
Ferric Iron	----	0.05	mg/L		<0.50	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.04**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.04**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.04**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		**0.7**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		**0.7**	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		**0.08**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**783**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**896**	----	----	----	----
ø Ionic Balance	----	0.01	%		**6.72**	----	----	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EP003: Total Organic Carbon (TOC) in Soil

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2204125**	Page	: 1 of 12
Client	: **LWC Management Pty Ltd**	Laboratory	: Environmental Division Perth
Contact	: K Mackenzie	Contact	: Kieren Burns
Address	: Suite 3 4-8 Goodwood Road WAYVILLE SOUTH AUSTRALIA 5034	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61881625130
Project	: W-AO-3	Date Samples Received	: 07-Apr-2022
Order number	: ----	Date Analysis Commenced	: 07-Apr-2022
C-O-C number	: ----	Issue Date	: 19-Apr-2022
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

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
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA

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.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
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
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 4279909)									
EP2203994-001	Anonymous	EG005T: Manganese	7439-96-5	5	mg/kg	22	22	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	2500	3000	18.2	0% - 20%
		EG005T: Calcium	7440-70-2	50	mg/kg	22500	21400	5.0	0% - 20%
		EG005T: Magnesium	7439-95-4	50	mg/kg	710	700	0.0	0% - 50%
EP2204066-001	Anonymous	EG005T: Manganese	7439-96-5	5	mg/kg	5	21	123	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	600	490	20.7	0% - 50%
		EG005T: Calcium	7440-70-2	50	mg/kg	69400	70700	1.8	0% - 20%
		EG005T: Magnesium	7439-95-4	50	mg/kg	3110	3160	1.5	0% - 20%
EA002: pH 1:5 (Soils) (QC Lot: 4279123)									
EP2204074-021	Anonymous	EA002: pH Value	----	0.1	pH Unit	8.8	8.8	1.1	0% - 20%
EP2204125-001	DUP1	EA002: pH Value	----	0.1	pH Unit	9.0	9.2	1.3	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 4279125)									
EP2204125-001	DUP1	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	56	56	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4279997)									
EP2204125-001	DUP1	EA055: Moisture Content	----	0.1	%	9.7	9.5	2.7	0% - 20%
ED007: Exchangeable Cations (QC Lot: 4285216)									
EP2203939-012	Anonymous	ED007: Exchangeable Sodium Percent	----	0.1	%	21.8	21.6	0.9	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	0.9	0.9	0.0	No Limit
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	2.4	2.5	0.0	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	1.0	1.0	0.0	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	4.4	4.6	3.5	0% - 20%
ED008: Exchangeable Cations (QC Lot: 4285218)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED008: Exchangeable Cations (QC Lot: 4285218) - continued									
EP2204125-002	DUP2	ED008: Exchangeable Sodium Percent	----	0.1	%	11.4	11.4	0.0	0% - 20%
		ED008: Exchangeable Calcium	----	0.1	meq/100g	22.2	22.5	1.2	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	3.8	3.9	0.0	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	0.6	0.6	0.0	No Limit
		ED008: Exchangeable Sodium	----	0.1	meq/100g	3.4	3.5	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	30.1	30.5	1.1	0% - 20%
ED040S: Soluble Major Anions (QC Lot: 4279122)									
EP2204074-021	Anonymous	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	40	40	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4279124)									
EP2204189-005	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.0	No Limit
EP2204074-021	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	20	10	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4279126)									
EP2204125-001	DUP1	EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	0.1	0.1	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4279127)									
EP2204125-001	DUP1	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	2.4	2.2	6.3	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4279505)									
EP2203939-012	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	90	70	25.6	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4279504)									
EP2203939-012	Anonymous	EK067G: Total Phosphorus as P	----	2	mg/kg	60	54	12.2	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 4286649)									
EB2209714-001	Anonymous	EP003: Total Organic Carbon	----	0.02	%	0.38	0.36	4.1	0% - 50%
EB2209617-001	Anonymous	EP003: Total Organic Carbon	----	0.02	%	30.7	30.8	0.2	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4285456)									
EP2204127-004	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.00	8.01	0.1	0% - 20%
EP2204119-004	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.50	6.58	1.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4285454)									
EP2204115-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1340	1350	0.4	0% - 20%
EP2204119-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	982	999	1.7	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4277084)									
EP2204091-007	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	816	802	1.7	0% - 20%
EP2204003-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1140	1110	2.8	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4277085)									
EP2204003-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4285457)									
EP2204127-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 4285457) - continued									
EP2204127-004	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	281	312	10.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	281	312	10.7	0% - 20%
EP2204119-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	2	2	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	2	2	0.0	No Limit
ED040F: Dissolved Major Anions (QC Lot: 4275274)									
EP2204107-010	Anonymous	ED040F: Silicon as SiO2	14464-46-1	0.1	mg/L	15.4	15.2	1.3	0% - 20%
ED040T: Total Major Anions (QC Lot: 4282420)									
EP2204125-004	DUP1S	ED040T: Silicon as SiO2	14464-46-1	0.1	mg/L	37.7	37.8	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4275271)									
EP2204107-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	170	168	1.2	0% - 20%
EP2204125-004	DUP1S	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3630	3530	2.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4275272)									
EP2204107-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	810	804	0.9	0% - 20%
EP2204125-004	DUP1S	ED045G: Chloride	16887-00-6	1	mg/L	24900	25000	0.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4279684)									
EP2204125-004	DUP1S	ED093F: Calcium	7440-70-2	1	mg/L	650	642	1.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1870	1820	2.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	16000	15400	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	537	520	3.3	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4279683)									
EP2204076-001	Anonymous	EG020D-F: Zirconium	7440-67-7	0.005	mg/L	<0.025	<0.025	0.0	No Limit
EP2204125-004	DUP1S	EG020D-F: Zirconium	7440-67-7	0.005	mg/L	<0.050	<0.050	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4279685)									
EP2204125-004	DUP1S	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0010	<0.0010	0.0	No Limit
		EG020A-F: Antimony	7440-36-0	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Lithium	7439-93-2	0.001	mg/L	0.257	0.245	4.6	0% - 20%
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.141	0.138	1.6	0% - 50%
		EG020A-F: Molybdenum	7439-98-7	0.001	mg/L	0.012	0.011	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.050	<0.050	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.10	<0.10	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4279685) - continued									
EP2204125-004	DUP1S	EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.10	<0.10	0.0	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.10	<0.10	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.50	<0.50	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 4279686)									
EP2204125-004	DUP1S	EG020B-F: Bismuth	7440-69-9	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020B-F: Silver	7440-22-4	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020B-F: Strontium	7440-24-6	0.001	mg/L	10.5	10.4	1.4	0% - 20%
		EG020B-F: Thorium	7440-29-1	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020B-F: Uranium	7440-61-1	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020B-F: Titanium	7440-32-6	0.01	mg/L	<0.10	<0.10	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4282417)									
EP2204039-021	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Antimony	7440-36-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lithium	7439-93-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4282418)									
EP2204125-004	DUP1S	EG020B-T: Bismuth	7440-69-9	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020B-T: Silver	7440-22-4	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020B-T: Strontium	7440-24-6	0.001	mg/L	10.9	10.7	2.3	0% - 20%
		EG020B-T: Thorium	7440-29-1	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020B-T: Uranium	7440-61-1	0.001	mg/L	<0.010	<0.010	0.0	No Limit
		EG020B-T: Titanium	7440-32-6	0.01	mg/L	0.20	0.12	48.8	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4282419)									
EP2204125-004	DUP1S	EG020D-T: Zirconium	7440-67-7	0.005	mg/L	<0.052	<0.052	0.0	No Limit
EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 4278035)									
EP2203991-010	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	0.13	0.13	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 4278035) - continued									
EP2204030-026	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4275276)									
EP2204014-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP2204119-007	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.02	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4275270)									
EP2204107-007	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP2204125-004	DUP1S	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4275277)									
EP2204014-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP2204119-007	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.08	29.9	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 4277630)									
EP2204012-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.4	0.4	0.0	No Limit
EP2204012-011	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.6	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 4277629)									
EP2204012-011	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.29	0.28	0.0	0% - 20%
EP2204012-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4275273)									
EP2204107-007	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.07	0.07	0.0	No Limit
EP2204125-004	DUP1S	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4279909)								
EG005T: Iron	7439-89-6	50	mg/kg	<50	6655 mg/kg	86.2	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	88.3	70.0	130
EG005T: Calcium	7440-70-2	50	mg/kg	<50	2545 mg/kg	101	70.0	130
EG005T: Magnesium	7439-95-4	50	mg/kg	<50	2091 mg/kg	95.4	70.0	130
EA002: pH 1:5 (Soils) (QCLot: 4279123)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	101	70.0	130
				----	7 pH Unit	100	70.0	130
EA010: Conductivity (1:5) (QCLot: 4279125)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	99.8	93.6	106
ED007: Exchangeable Cations (QCLot: 4285216)								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	21.6 meq/100g	108	82.9	117
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.76 meq/100g	106	78.4	119
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	1 meq/100g	110	87.9	129
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.9 meq/100g	112	92.9	132
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	25.3 meq/100g	108	84.7	117
ED007: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----
ED008: Exchangeable Cations (QCLot: 4285218)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	22.1 meq/100g	102	78.7	111
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.56 meq/100g	89.6	77.6	111
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.91 meq/100g	94.5	86.9	116
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.38 meq/100g	97.1	72.3	129
ED008: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	24.95 meq/100g	101	79.9	110
ED040S: Soluble Major Anions (QCLot: 4279122)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	750 mg/kg	105	91.8	114
ED045G: Chloride by Discrete Analyser (QCLot: 4279124)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	102	88.0	115
				<10	5000 mg/kg	109	88.0	115
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4279126)								
EK057G: Nitrite as N (Sol.)	14797-65-0	0.1	mg/kg	<0.1	2.5 mg/kg	106	94.7	106
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4279127)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	101	89.8	109
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4279505)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4279505) - continued								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	89.9	78.0	112
				<20	100 mg/kg	103	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4279504)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	440 mg/kg	86.0	78.0	108
				<2	44 mg/kg	107	70.0	130
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 4286649)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.56 %	94.7	80.0	120
				<0.02	27.8 %	99.5	80.0	120

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EA005P: pH by PC Titrator (QCLot: 4285456)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.5	102
				----	7 pH Unit	100	98.5	102
EA010P: Conductivity by PC Titrator (QCLot: 4285454)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	24800 µS/cm	98.9	92.1	105
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4277084)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	246 mg/L	105	88.1	114
				<10	1000 mg/L	103	88.1	114
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4277085)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	95 mg/L	103	89.1	120
				<5	1000 mg/L	103	89.1	120
ED037P: Alkalinity by PC Titrator (QCLot: 4285457)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	107	81.2	126
				<1	200 mg/L	102	90.0	110
ED040F: Dissolved Major Anions (QCLot: 4275274)								
ED040F: Silicon as SiO2	14464-46-1	0.1	mg/L	<0.1	21.4 mg/L	100	85.0	115
ED040T: Total Major Anions (QCLot: 4282420)								
ED040T: Silicon as SiO2	14464-46-1	0.1	mg/L	<0.1	21.4 mg/L	102	85.0	115
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4275271)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.1	87.7	113
				<1	500 mg/L	95.0	87.7	113
ED045G: Chloride by Discrete Analyser (QCLot: 4275272)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 4275272) - continued								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	87.9	114
				<1	1000 mg/L	99.9	87.9	114
ED093F: Dissolved Major Cations (QCLot: 4279684)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	109	85.9	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.0	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	87.3	118
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.1	89.7	108
EG020F: Dissolved Metals by ICP-MS (QCLot: 4279683)								
EG020D-F: Zirconium	7440-67-7	0.005	mg/L	<0.005	0.01 mg/L	102	80.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 4279685)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	84.0	120
EG020A-F: Antimony	7440-36-0	0.001	mg/L	<0.001	0.02 mg/L	102	72.0	120
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.3	84.0	120
EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	115	81.0	120
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.9	86.0	120
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.7	85.0	120
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	98.4	84.0	120
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.8	84.0	120
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.2	85.0	120
EG020A-F: Lithium	7439-93-2	0.001	mg/L	<0.001	0.1 mg/L	116	76.0	120
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.1	85.0	120
EG020A-F: Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.1 mg/L	98.5	86.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.7	84.0	120
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	90.8	88.0	120
EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	100	85.0	120
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.3	89.0	120
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	110	84.0	120
EG020F: Dissolved Metals by ICP-MS (QCLot: 4279686)								
EG020B-F: Bismuth	7440-69-9	0.001	mg/L	<0.001	0.1 mg/L	87.1	85.1	114
EG020B-F: Silver	7440-22-4	0.001	mg/L	<0.001	0.02 mg/L	94.5	65.0	120
EG020B-F: Strontium	7440-24-6	0.001	mg/L	<0.001	0.1 mg/L	97.5	88.1	116
EG020B-F: Thorium	7440-29-1	0.001	mg/L	<0.001	0.1 mg/L	102	80.0	120
EG020B-F: Titanium	7440-32-6	0.01	mg/L	<0.01	0.1 mg/L	99.2	75.7	120
EG020B-F: Uranium	7440-61-1	0.001	mg/L	<0.001	0.1 mg/L	99.3	80.0	120
EG020T: Total Metals by ICP-MS (QCLot: 4282417)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	107	89.7	117
EG020A-T: Antimony	7440-36-0	0.001	mg/L	<0.001	0.02 mg/L	108	82.9	120
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	89.6	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 4282417) - continued								
EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	116	85.4	120
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	103	89.2	116
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	102	87.8	114
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	85.8	115
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	102	88.4	111
EG020A-T: Lithium	7439-93-2	0.001	mg/L	<0.001	0.1 mg/L	117	79.1	120
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	88.5	115
EG020A-T: Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.1 mg/L	112	89.7	120
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.6	87.4	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.6	87.6	120
EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	103	89.5	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	106	88.1	120
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	116	87.1	120
EG020T: Total Metals by ICP-MS (QCLot: 4282418)								
EG020B-T: Bismuth	7440-69-9	0.001	mg/L	<0.001	0.1 mg/L	96.6	87.4	114
EG020B-T: Silver	7440-22-4	0.001	mg/L	<0.001	0.02 mg/L	99.8	66.8	120
EG020B-T: Strontium	7440-24-6	0.001	mg/L	<0.001	0.1 mg/L	104	89.5	119
EG020B-T: Thorium	7440-29-1	0.001	mg/L	<0.001	0.1 mg/L	119	80.0	120
EG020B-T: Titanium	7440-32-6	0.01	mg/L	<0.01	0.1 mg/L	103	85.0	120
EG020B-T: Uranium	7440-61-1	0.001	mg/L	<0.001	0.1 mg/L	103	80.0	120
EG020T: Total Metals by ICP-MS (QCLot: 4282419)								
EG020D-T: Zirconium	7440-67-7	0.005	mg/L	<0.005	0.01 mg/L	111	80.0	120
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 4278035)								
EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	2 mg/L	104	91.5	113
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4275276)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	103	86.2	111
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4275270)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	106	88.7	113
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4275277)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	90.5	110
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4277630)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	87.1	75.8	100
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4277629)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	89.6	70.0	110
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4275273)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	101	89.4	109

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4279909)							
EP2203994-001	Anonymous	EG005T: Manganese	7439-96-5	50 mg/kg	130	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4279124)							
EP2204074-022	Anonymous	ED045G: Chloride	16887-00-6	5000 mg/kg	103	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4279126)							
EP2204125-002	DUP2	EK057G: Nitrite as N (Sol.)	14797-65-0	2.5 mg/kg	99.1	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4279127)							
EP2204125-002	DUP2	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4279505)							
EP2203939-013	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	102	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4279504)							
EP2203939-013	Anonymous	EK067G: Total Phosphorus as P	----	100 mg/kg	85.9	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4275271)							
EP2204072-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	85.7	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4275272)							
EP2204072-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	94.3	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 4279683)							
EP2204076-002	Anonymous	EG020D-F: Zirconium	7440-67-7	0.05 mg/L	93.7	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4282417)							
EP2204125-004	DUP1S	EG020A-T: Arsenic	7440-38-2	1 mg/L	106	70.0	130
		EG020A-T: Beryllium	7440-41-7	1 mg/L	111	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	103	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	101	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	104	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	97.5	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	98.6	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 4282417) - continued							
EP2204125-004	DUP1S	EG020A-T: Vanadium	7440-62-2	1 mg/L	104	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	107	70.0	130
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 4278035)							
EP2203991-010	Anonymous	EG051G: Ferrous Iron	----	1 mg/L	107	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4275276)							
EP2204014-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	103	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4275270)							
EP2204107-006	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	94.5	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4275277)							
EP2204014-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	95.5	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 4277630)							
EP2204012-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	93.9	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 4277629)							
EP2204012-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	97.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4275273)							
EP2204107-006	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	92.8	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2204125**	Page	: 1 of 14
Client	: **LWC Management Pty Ltd**	Laboratory	: Environmental Division Perth
Contact	: K Mackenzie	Telephone	: +61881625130
Project	: W-AO-3	Date Samples Received	: 07-Apr-2022
Site	: ----	Issue Date	: 19-Apr-2022
Sampler	: ----	No. of samples received	: 4
Order number	: ----	No. of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EP2204125--002	DUP2	**Nitrite + Nitrate as N (Sol.)**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA002: pH 1:5 (Soils)						
Soil Glass Jar - Unpreserved						
DUP3	12-Apr-2022	10-Apr-2022	**2**	----	----	----
Soil Glass Jar - Unpreserved						
DUP1, DUP2	12-Apr-2022	07-Apr-2022	**5**	----	----	----
EA010: Conductivity (1:5)						
Soil Glass Jar - Unpreserved						
DUP3	12-Apr-2022	10-Apr-2022	**2**	----	----	----
Soil Glass Jar - Unpreserved						
DUP1, DUP2	12-Apr-2022	07-Apr-2022	**5**	----	----	----
EK057G: Nitrite as N by Discrete Analyser						
Soil Glass Jar - Unpreserved						
DUP3	12-Apr-2022	10-Apr-2022	**2**	----	----	----
Soil Glass Jar - Unpreserved						
DUP1, DUP2	12-Apr-2022	07-Apr-2022	**5**	----	----	----

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
DUP1S	----	----	----	13-Apr-2022	04-Apr-2022	**9**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
DUP1S	----	----	----	07-Apr-2022	06-Apr-2022	**1**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
DUP1S	----	----	----	07-Apr-2022	06-Apr-2022	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)					
Dissolved Metals by ICP-MS - Suite A	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite D	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA002: pH 1:5 (Soils)							
Soil Glass Jar - Unpreserved (EA002) DUP3	**03-Apr-2022**	**12-Apr-2022**	10-Apr-2022	×	**12-Apr-2022**	12-Apr-2022	✓
Soil Glass Jar - Unpreserved (EA002) DUP1, DUP2	**31-Mar-2022**	**12-Apr-2022**	07-Apr-2022	×	**12-Apr-2022**	12-Apr-2022	✓
EA010: Conductivity (1:5)							
Soil Glass Jar - Unpreserved (EA010) DUP3	**03-Apr-2022**	**12-Apr-2022**	10-Apr-2022	×	**12-Apr-2022**	10-May-2022	✓
Soil Glass Jar - Unpreserved (EA010) DUP1, DUP2	**31-Mar-2022**	**12-Apr-2022**	07-Apr-2022	×	**12-Apr-2022**	10-May-2022	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) DUP3	**03-Apr-2022**	**----**	----	----	**11-Apr-2022**	17-Apr-2022	✓
Soil Glass Jar - Unpreserved (EA055) DUP1, DUP2	**31-Mar-2022**	**----**	----	----	**11-Apr-2022**	14-Apr-2022	✓
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007) DUP3	**03-Apr-2022**	**13-Apr-2022**	01-May-2022	✓	**13-Apr-2022**	01-May-2022	✓
Soil Glass Jar - Unpreserved (ED007) DUP1	**31-Mar-2022**	**13-Apr-2022**	28-Apr-2022	✓	**13-Apr-2022**	28-Apr-2022	✓
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008) DUP2	**31-Mar-2022**	**13-Apr-2022**	28-Apr-2022	✓	**13-Apr-2022**	28-Apr-2022	✓
ED040S: Soluble Major Anions							
Soil Glass Jar - Unpreserved (ED040S) DUP3	**03-Apr-2022**	**12-Apr-2022**	01-May-2022	✓	**12-Apr-2022**	10-May-2022	✓
Soil Glass Jar - Unpreserved (ED040S) DUP1, DUP2	**31-Mar-2022**	**12-Apr-2022**	28-Apr-2022	✓	**12-Apr-2022**	10-May-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Soil Glass Jar - Unpreserved (ED045G) DUP3	**03-Apr-2022**	**12-Apr-2022**	01-May-2022	✓	**12-Apr-2022**	10-May-2022	✓
Soil Glass Jar - Unpreserved (ED045G) DUP1, DUP2	**31-Mar-2022**	**12-Apr-2022**	28-Apr-2022	✓	**12-Apr-2022**	10-May-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) DUP3	**03-Apr-2022**	**11-Apr-2022**	30-Sep-2022	✓	**12-Apr-2022**	30-Sep-2022	✓
Soil Glass Jar - Unpreserved (EG005T) DUP1, DUP2	**31-Mar-2022**	**11-Apr-2022**	27-Sep-2022	✓	**12-Apr-2022**	27-Sep-2022	✓
EK057G: Nitrite as N by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK057G) DUP3	**03-Apr-2022**	**12-Apr-2022**	10-Apr-2022	×	**12-Apr-2022**	14-Apr-2022	✓
Soil Glass Jar - Unpreserved (EK057G) DUP1, DUP2	**31-Mar-2022**	**12-Apr-2022**	07-Apr-2022	×	**12-Apr-2022**	14-Apr-2022	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK059G) DUP3	**03-Apr-2022**	**12-Apr-2022**	01-May-2022	✓	**12-Apr-2022**	14-Apr-2022	✓
Soil Glass Jar - Unpreserved (EK059G) DUP1, DUP2	**31-Mar-2022**	**12-Apr-2022**	28-Apr-2022	✓	**12-Apr-2022**	14-Apr-2022	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Soil Glass Jar - Unpreserved (EK061G) DUP3	**03-Apr-2022**	**11-Apr-2022**	01-May-2022	✓	**13-Apr-2022**	09-May-2022	✓
Soil Glass Jar - Unpreserved (EK061G) DUP1, DUP2	**31-Mar-2022**	**11-Apr-2022**	28-Apr-2022	✓	**13-Apr-2022**	09-May-2022	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK067G) DUP3	**03-Apr-2022**	**11-Apr-2022**	01-May-2022	✓	**13-Apr-2022**	09-May-2022	✓
Soil Glass Jar - Unpreserved (EK067G) DUP1, DUP2	**31-Mar-2022**	**11-Apr-2022**	28-Apr-2022	✓	**13-Apr-2022**	09-May-2022	✓
EP003: Total Organic Carbon (TOC) in Soil							
Soil Glass Jar - Unpreserved (EP003) DUP3	**03-Apr-2022**	**13-Apr-2022**	01-May-2022	✓	**13-Apr-2022**	01-May-2022	✓
Soil Glass Jar - Unpreserved (EP003) DUP1, DUP2	**31-Mar-2022**	**13-Apr-2022**	28-Apr-2022	✓	**13-Apr-2022**	28-Apr-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) DUP1S	**04-Apr-2022**	**----**	----	----	**13-Apr-2022**	04-Apr-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
DUP1S	**04-Apr-2022**	**----**	----	----	**13-Apr-2022**	02-May-2022	✓
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
DUP1S	**04-Apr-2022**	**----**	----	----	**08-Apr-2022**	11-Apr-2022	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
DUP1S	**04-Apr-2022**	**----**	----	----	**08-Apr-2022**	11-Apr-2022	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
DUP1S	**04-Apr-2022**	**----**	----	----	**11-Apr-2022**	02-May-2022	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
DUP1S	**04-Apr-2022**	**----**	----	----	**13-Apr-2022**	18-Apr-2022	✓
ED040F: Dissolved Major Anions							
Clear Plastic Bottle - Natural (ED040F)							
DUP1S	**04-Apr-2022**	**----**	----	----	**11-Apr-2022**	02-May-2022	✓
ED040T: Total Major Anions							
Clear Plastic Bottle - Unfiltered; Lab-acidified (ED040T)							
DUP1S	**04-Apr-2022**	**13-Apr-2022**	02-May-2022	✓	**13-Apr-2022**	02-May-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
DUP1S	**04-Apr-2022**	**----**	----	----	**07-Apr-2022**	02-May-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
DUP1S	**04-Apr-2022**	**----**	----	----	**07-Apr-2022**	02-May-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
DUP1S	**04-Apr-2022**	**----**	----	----	**11-Apr-2022**	02-May-2022	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020D-F)							
DUP1S	**04-Apr-2022**	**----**	----	----	**11-Apr-2022**	01-Oct-2022	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020D-T)							
DUP1S	**04-Apr-2022**	**13-Apr-2022**	01-Oct-2022	✓	**13-Apr-2022**	01-Oct-2022	✓
EG051G: Ferrous Iron by Discrete Analyser							
Clear Plastic Bottle - HCl - Filtered (EG051G)							
DUP1S	**04-Apr-2022**	**----**	----	----	**08-Apr-2022**	11-Apr-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
DUP1S	**04-Apr-2022**	**----**	----	----	**07-Apr-2022**	02-May-2022	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
DUP1S	**04-Apr-2022**	**----**	----	----	**07-Apr-2022**	06-Apr-2022	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
DUP1S	**04-Apr-2022**	**----**	----	----	**07-Apr-2022**	02-May-2022	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
DUP1S	**04-Apr-2022**	**11-Apr-2022**	02-May-2022	✓	**11-Apr-2022**	02-May-2022	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
DUP1S	**04-Apr-2022**	**11-Apr-2022**	02-May-2022	✓	**11-Apr-2022**	02-May-2022	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
DUP1S	**04-Apr-2022**	**----**	----	----	**07-Apr-2022**	06-Apr-2022	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Chloride Soluble By Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK067G	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	2	6	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK067G	2	6	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK067G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride Soluble By Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TKN as N By Discrete Analyser	EK061G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosporus By Discrete Analyser	EK067G	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite B	EG020B-F	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite D	EG020D-F	2	1	**200.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ferrous Iron by Discrete Analyser	EG051G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Dissolved	ED040F	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Total	ED040T	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	18	**11.11**	**10.53**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite B	EG020B-T	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite D	EG020D-T	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP) - Continued							
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite B	EG020B-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite D	EG020D-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ferrous Iron by Discrete Analyser	EG051G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Dissolved	ED040F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Total	ED040T	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	18	**11.11**	**10.53**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite B	EG020B-T	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite D	EG020D-T	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by PC Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite B	EG020B-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite D	EG020D-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ferrous Iron by Discrete Analyser	EG051G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Dissolved	ED040F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Total	ED040T	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	18	**5.56**	**5.26**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite B	EG020B-T	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite D	EG020D-T	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite D	EG020D-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ferrous Iron by Discrete Analyser	EG051G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite D	EG020D-T	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Lyons Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM Schedule B(3).
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Nitrite as N - Soluble by Discrete Analyser	EK057G	SOIL	In house: Referenced to APHA 4500-NO3- B. Nitrite in a water extract is determined by direct colourimetry by Discrete Analyser.
Nitrate as N - Soluble by Discrete Analyser	EK058G	SOIL	In house: Referenced to APHA 4500-NO3- F. Nitrate in the 1:5 soil:water extract is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results.
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	SOIL	In house: Thermo Scientific Method D08727 and NEMI (National Environmental Method Index) Method ID: 9171. This method covers the determination of total oxidised nitrogen (NOx-N) and nitrate (NO3-N) by calculation, Combined oxidised Nitrogen (NO2+NO3) in a water extract is determined by direct colourimetry by Discrete Analyser.
TKN as N By Discrete Analyser	EK061G	SOIL	In house: Referenced to APHA 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NOx) By Discrete Analyser	EK062G	SOIL	In house: Referenced to APHA 4500 Norg/NO3- Total Nitrogen is determined as the sum of TKN and Oxidised Nitrrogen, each determined seperately as N.
Total Phosporus By Discrete Analyser	EK067G	SOIL	In house: Referenced to APHA 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.

Analytical Methods	Method	Matrix	Method Descriptions
Total Organic Carbon	EP003	SOIL	In house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automatically measured by infra-red detector.
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Major Anions - Dissolved	ED040F	WATER	In house: Referenced to APHA 3120. The 0.45µm filtered samples are determined by ICP/AES for Sulfur and/or Silcon content and reported as Sulfate and/or Silica after conversion by gravimetric factor.
Major Anions - Total	ED040T	WATER	In house: Referenced to APHA 3120 Samples are digested by USEPA 3005 prior to analysis. Sulfur and/or Silicon content is determined by ICP/AES and reported as Sulfate and/or Silica after conversion by gravimetric factor.
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Metals by ICP-MS - Suite B	EG020B-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite B	EG020B-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Metals by ICP-MS - Suite D	EG020D-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite D	EG020D-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Ferrous Iron by Discrete Analyser	EG051G	WATER	In house: Referenced to APHA 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3).
Ferric Iron - Dissolved	EG053FG-MS	WATER	In house: Referenced to APHA 3500 Fe-B. The 0.45µm filtered Ferric Iron is determined as the difference between Filtered Iron and Filtered Ferrous Iron quantify by ICPMS and Discrete Analyser.
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Lyons method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
TKN/TP Digestion	EK061/EK067	SOIL	In house: Referenced to APHA 4500 Norg- D; APHA 4500 P - H. Macro Kjeldahl digestion.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2204125**

Client	: **LWC Management Pty Ltd**	Laboratory	: Environmental Division Perth
Contact	: K Mackenzie	Contact	: Kieren Burns
Address	: Suite 3 4-8 Goodwood Road WAYVILLE SOUTH AUSTRALIA 5034	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: kmackenzie@lwconsulting.com.au	E-mail	: Kieren.Burns@alsglobal.com
Telephone	: ----	Telephone	: +61881625130
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: W-AO-3	Page	: 1 of 4
Order number	: ----	Quote number	: EB2017LANWAT0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 07-Apr-2022 12:50	Issue Date	: 07-Apr-2022
Client Requested Due Date	: 14-Apr-2022	Scheduled Reporting Date	: **14-Apr-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 18.4 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 4 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested
EP2204125-001	31-Mar-2022 00:00	DUP1	✓
EP2204125-002	31-Mar-2022 00:00	DUP2	✓
EP2204125-003	03-Apr-2022 00:00	DUP3	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA025H Suspended Solids - Standard Level	WATER - NT-01D & 02 Major Cations & Anions (Ca, Mg, Na, K, Cl, SO4,	WATER - NT-08A Total Nitrogen + NO2 + NO3 + NH3 + Total P +	WATER - W-01 7 Metals
EP2204125-004	04-Apr-2022 00:00	DUP1S	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - ED040F Dissolved Major Anions	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EG051G Ferrous Iron	WATER - EG053FG-MS Dissolved Ferric Iron by ICPMS/DA	WATER - W-01T 7 metals (Total)
EP2204125-004	04-Apr-2022 00:00	DUP1S	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - ED040T Total Major Anions (including digestion)
EP2204125-004	04-Apr-2022 00:00	DUP1S	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA005-P: pH by PC Titrator							
DUP1S	Clear Plastic Bottle - Natural	----	04-Apr-2022	07-Apr-2022	✘	----	----
EK057G: Nitrite as N by Discrete Analyser							
DUP1S	Clear Plastic Bottle - Natural	----	06-Apr-2022	07-Apr-2022	✘	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
DUP1S	Clear Plastic Bottle - Natural	----	06-Apr-2022	07-Apr-2022	✘	----	----

Requested Deliverables

EMILY PICKEN		
- *AU Certificate of Analysis - NATA (COA)	Email	epicken@lwconsulting.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicken@lwconsulting.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicken@lwconsulting.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicken@lwconsulting.com.au
- Chain of Custody (CoC) (COC)	Email	epicken@lwconsulting.com.au
- EDI Format - ENMRG (ENMRG)	Email	epicken@lwconsulting.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicken@lwconsulting.com.au
ESDAT RESULTS		
- EDI Format - ESDAT (ESDAT)	Email	lwconsulting@esdat.com.au
INVOICES ADDRESS		
- A4 - AU Tax Invoice (INV)	Email	admin@lwconsulting.com.au
K Mackenzie		
- *AU Certificate of Analysis - NATA (COA)	Email	kmackenzie@lwconsulting.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kmackenzie@lwconsulting.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kmackenzie@lwconsulting.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	kmackenzie@lwconsulting.com.au
- Chain of Custody (CoC) (COC)	Email	kmackenzie@lwconsulting.com.au
- EDI Format - ENMRG (ENMRG)	Email	kmackenzie@lwconsulting.com.au
- EDI Format - ESDAT (ESDAT)	Email	kmackenzie@lwconsulting.com.au
- EDI Format - XTab (XTAB)	Email	kmackenzie@lwconsulting.com.au
RESULTS/INVOICES ADDRESS		
- *AU Certificate of Analysis - NATA (COA)	Email	laboratoryresults@lwconsulting.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	laboratoryresults@lwconsulting.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	laboratoryresults@lwconsulting.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	laboratoryresults@lwconsulting.com.au
- A4 - AU Tax Invoice (INV)	Email	laboratoryresults@lwconsulting.com.au
- Chain of Custody (CoC) (COC)	Email	laboratoryresults@lwconsulting.com.au
- EDI Format - ENMRG (ENMRG)	Email	laboratoryresults@lwconsulting.com.au
- EDI Format - ESDAT (ESDAT)	Email	laboratoryresults@lwconsulting.com.au

CHAIN OF CUSTODY FORM

~~Envirolab~~ ALS

From : Land & Water Consulting Pty Ltd
Suite 3, 4-8 Goodwood Road, WAYVILLE, SA, 5034
ph: (08) 8271 5255 fax: (08) 8357 1307

LAB Quote Number: 210920LWCW

LWC Contact Information:
Contact Name:
Karen Mackenzie
Contact Email:
laboratoryresults@lwconsulting.com.au
epicken@lwconsulting.com.au

Phone Number:
08 8271 5255

LWC Project No:
W-AO-3

Project Manager:
Karen Mackenzie

Date Samples Sent:
5.4.22

COC Checked by: A Vaughan

Sample Analysis

Lab ID	Date	Matrix	Sample ID	No. Bottles	Suite 1	Suite 2	Suite 3	Suite 4	Suite 5	Analysis to follow			
					Tick required analytes								
1	31.3.22	S	DUP1	1						X			
2	31.3.22	S	DUP2	1						X			
3	3.4.22	S	DUP 3	1						X			
4	4.4.22	W	DUP1S	5	X								
			TOTAL	8 + 1						3			

Environmental Division
Perth
Work Order Reference
EP2204125

Telephone : – 61-8-9406 1301

ADDITIONAL COMMENTS:

Suite 1 - Major components, metals and nutrients:
☐EC
☐Total dissolved solids (TDS) and Total Suspended Solids (TSS).
☐Laboratory pH
☐Major Ions including calcium, sodium, potassium, magnesium, chloride, sulphate, bicarbonate and carbonate.
☐Hydroxide alkalinity as CaCO3, carbonate alkalinity as CaCO3 and bicarbonate as CaCO3.
☐Water Hardness
☐Total and dissolved metals including Al, As, Be, Bi, Cd, Co, Cr, Cu, Fe, Li, Mn, Mo, Ni, Pb, Sb, Ag, SiO2, Se, Sr, Th, Ti, U, V, Zn and Zr.
☐Speciation of Ferric Iron and Ferrous Iron (actual and not calculated).
☐Nutrients including total nitrogen, nitrate as N, nitrite as N, ammonia, TKN and filtered reactive phosphorous.

Suite 2 - Drilling Muds Check (for rotary mud method):
☐Major cations and anions
☐Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, total Xylenes, Naphthalene (BTEXN)

Suite 3 - Hydrocarbons:
☐Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, total Xylenes, Naphthalene (BTEXN)

Suite 4 - Rinsate Screen:
☐Total metals including Al, As, Be, Bi, Cd, Co, Cr, Cu, Fe, Li, Mn, Mo, Ni, Pb, Sb, Ag, SiO2, Se, Sr, Th, Ti, U, V, Zn and Zr.

Suite 5 - Tripblank
☐TRH Fraction C6-C10 and BTEXN

Note:
Metals samples have been field filtered using 0.45um, however, 0.22um filtering is required for the following samples for the analysis of metals:

Rec: LD 7/4 1250

APPENDIX B – CERTIFIED LABORATORY ANALYTICAL REPORTS – MINERALOGY

5 Alvan St,
Mount Lawley
WA 6050

Client:	Land and Water Consulting	**Date received:**	21/01/2022
Client address:	Level 7, 191 St Georges Terrace Perth WA 6000	**Date analysed:**	4/02/2022
Job number:	22_0098	**Date reported:**	4/02/2022
Lab ID:	22_0098_18		
Client ID:	MW05 3.00m		
Analysis :	Semi-quantitative XRD analysis		
Revision number:	0		
Comments:	None		

Sample preparation

The sample was supplied by the client to Microanalysis Australia on 21/01/2022 for the above mentioned analyses. A representative sub-sample was removed and lightly ground such that 90% was passing 20 µm. Grinding to this size helps eliminate preferred orientation.

Analysis

Only crystalline material present in the sample will give peaks in the XRD scan. Amorphous (non-crystalline) material will add to the background. The search match software used was Eva 4.3. An up-to-date ICDD card set was used. The X-ray source was cobalt radiation.

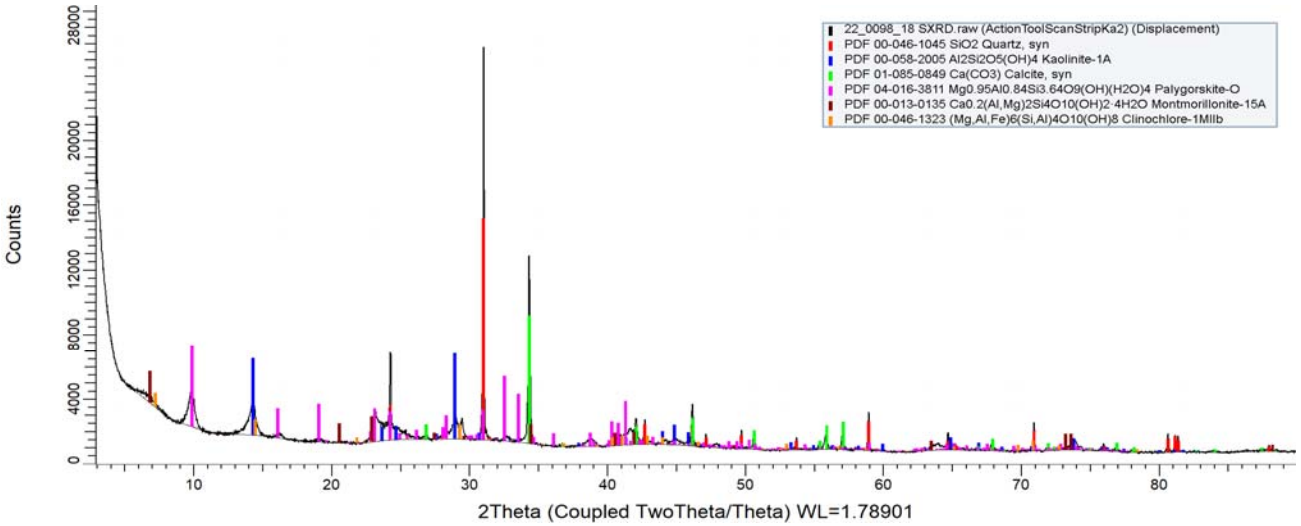
No standards were used in the quantification process. The concentrations were calculated using the normalized reference intensity ratio method where the intensity of the 100% peak divided by the published I/Ic value for each mineral phase is summed and the relative percentages of each phase calculated based on the relative contribution to the sum. This method allows for slight attention to be paid to preferred orientation but is limited in considering other factors including but not limited to; variable crystallinity, alteration, fluorescence, substitution and lattice strain.

Summary

The phases are listed in order of interpreted concentration:

Crystalline mineral phase	Concentration (%)	ICDD match probability
Palygorskite-O (Mg0.95Al0.84Si3.64O9(OH)(H2O)4)	28	Medium
Kaolinite-1A (Al2Si2O5(OH)4)	25	High
Quartz, syn (SiO2)	19	High
Calcite, syn (Ca(CO3))	12	High
Montmorillonite-15A (Ca0.2(Al,Mg)2Si4O10(OH)2·4H2O)	9	Medium
Clinochlore-1MIIb ((Mg,Al,Fe)6(Si,Al)4O10(OH)8)	6	Low

The ICDD match probability is reported as an indication as to how well the peak positions and relative intensities for the sample matched those in the published literature (www.icdd.org) for that particular compound.



Analyst: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Reported: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Approved: Ian Davies, B.Sc.(Chemistry)

5 Alvan St,
Mount Lawley
WA 6050

Client:	Land and Water Consulting	**Date received:**	21/01/2022
Client address:	Level 7, 191 St Georges Terrace Perth WA 6000	**Date analysed:**	4/02/2022
Job number:	22_0098	**Date reported:**	4/02/2022
Lab ID:	22_0098_15		
Client ID:	MW05 7.00m		
Analysis :	Semi-quantitative XRD analysis		
Revision number:	0		
Comments:	None		

Sample preparation

The sample was supplied by the client to Microanalysis Australia on 21/01/2022 for the above mentioned analyses. A representative sub-sample was removed and lightly ground such that 90% was passing 20 µm. Grinding to this size helps eliminate preferred orientation.

Analysis

Only crystalline material present in the sample will give peaks in the XRD scan. Amorphous (non-crystalline) material will add to the background. The search match software used was Eva 4.3. An up-to-date ICDD card set was used. The X-ray source was cobalt radiation.

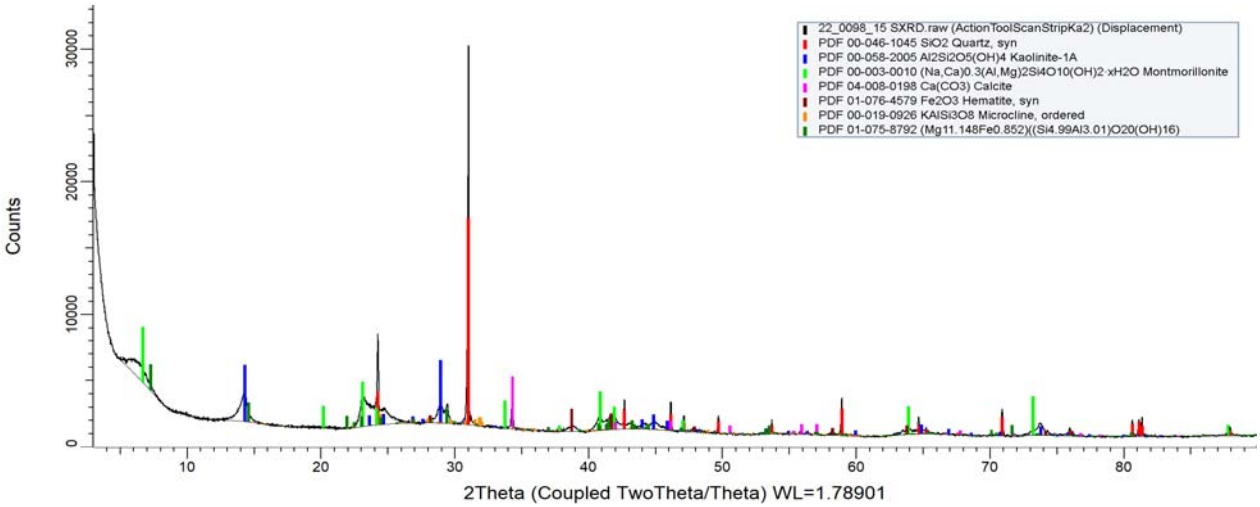
No standards were used in the quantification process. The concentrations were calculated using the normalized reference intensity ratio method where the intensity of the 100% peak divided by the published I/Ic value for each mineral phase is summed and the relative percentages of each phase calculated based on the relative contribution to the sum. This method allows for slight attention to be paid to preferred orientation but is limited in considering other factors including but not limited to; variable crystallinity, alteration, fluorescence, substitution and lattice strain.

Summary

The phases are listed in order of interpreted concentration:

Crystalline mineral phase	Concentration (%)	ICDD match probability
Quartz, syn (SiO2)	26	High
Kaolinite-1A (Al2Si2O5(OH)4)	24	High
Montmorillonite ((Na,Ca)0.3(Al,Mg)2Si4O10(OH)2·xH2O)	22	Medium
Clinochlore | Magnesium Iron Aluminum Silicate Hydroxide ((Mg11.148Fe0.852)((Si4.99Al3.0	12	Medium
Microcline, ordered (KAlSi3O8)	7	Medium
Calcite (Ca(CO3))	6	Medium
Hematite, syn (Fe2O3)	3	Low

The ICDD match probability is reported as an indication as to how well the peak positions and relative intensities for the sample matched those in the published literature (www.icdd.org) for that particular compound.



Reported: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Reported: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Approved: Ian Davies, B.Sc.(Chemistry)

5 Alvan St,
Mount Lawley
WA 6050

Client:	Land and Water Consulting	**Date received:**	21/01/2022
Client address:	Level 7, 191 St Georges Terrace Perth WA 6000	**Date analysed:**	4/02/2022
Job number:	22_0098	**Date reported:**	4/02/2022
Lab ID:	22_0098_16		
Client ID:	MW05 12.00m		
Analysis :	Semi-quantitative XRD analysis		
Revision number:	0		
Comments:	None		

Sample preparation

The sample was supplied by the client to Microanalysis Australia on 21/01/2022 for the above mentioned analyses. A representative sub-sample was removed and lightly ground such that 90% was passing 20 µm. Grinding to this size helps eliminate preferred orientation.

Analysis

Only crystalline material present in the sample will give peaks in the XRD scan. Amorphous (non-crystalline) material will add to the background. The search match software used was Eva 4.3. An up-to-date ICDD card set was used. The X-ray source was cobalt radiation.

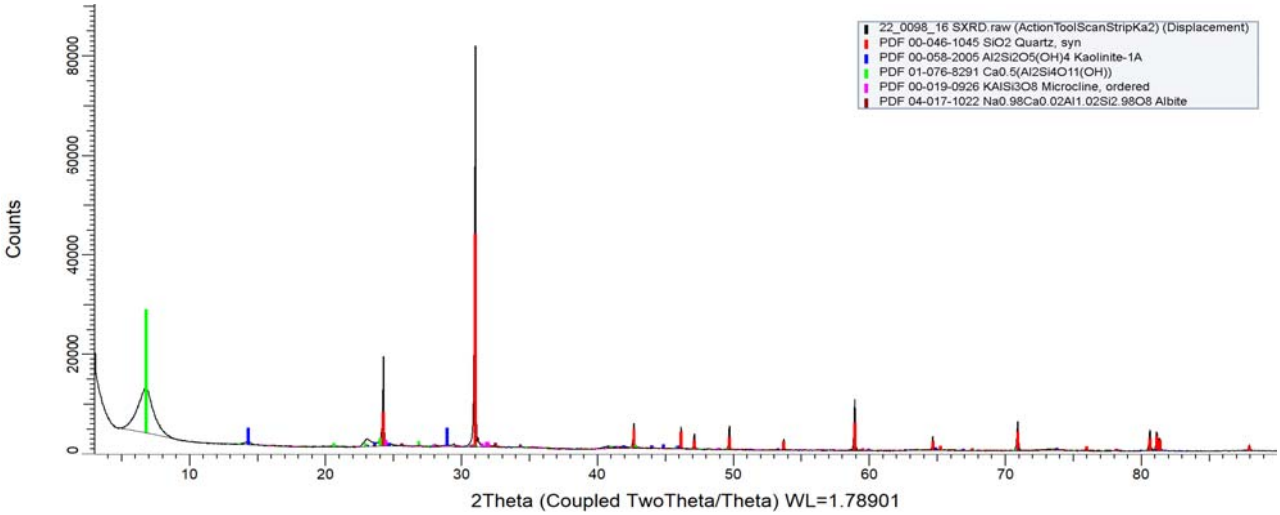
No standards were used in the quantification process. The concentrations were calculated using the normalized reference intensity ratio method where the intensity of the 100% peak divided by the published I/Ic value for each mineral phase is summed and the relative percentages of each phase calculated based on the relative contribution to the sum. This method allows for slight attention to be paid to preferred orientation but is limited in considering other factors including but not limited to; variable crystallinity, alteration, fluorescence, substitution and lattice strain.

Summary

The phases are listed in order of interpreted concentration:

Crystalline mineral phase	Concentration (%)	ICDD match probability
Quartz, syn (SiO2)	60	High
Kaolinite-1A (Al2Si2O5(OH)4)	18	Medium
Microcline, ordered (KAlSi3O8)	9	Medium
Montmorillonite| Calcium Aluminum Silicon Oxide Hydroxide (Ca0.5(Al2Si4O11(OH)))	6	Medium
Albite (Na0.98Ca0.02Al1.02Si2.98O8)	6	Medium

The ICDD match probability is reported as an indication as to how well the peak positions and relative intensities for the sample matched those in the published literature (www.icdd.org) for that particular compound.



Analyst: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Reported: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Approved: Ian Davies, B.Sc.(Chemistry)

5 Alvan St,
Mount Lawley
WA 6050

Client:	Land and Water Consulting	**Date received:**	21/01/2022
Client address:	Level 7, 191 St Georges Terrace Perth WA 6000	**Date analysed:**	4/02/2022
Job number:	22_0098	**Date reported:**	4/02/2022
Lab ID:	22_0098_32		
Client ID:	MBH007 20-20.5m		
Analysis :	Semi-quantitative XRD analysis		
Revision number:	0		
Comments:	None		

Sample preparation

The sample was supplied by the client to Microanalysis Australia on 21/01/2022 for the above mentioned analyses. A representative sub-sample was removed and lightly ground such that 90% was passing 20 µm. Grinding to this size helps eliminate preferred orientation.

Analysis

Only crystalline material present in the sample will give peaks in the XRD scan. Amorphous (non-crystalline) material will add to the background. The search match software used was Eva 4.3. An up-to-date ICDD card set was used. The X-ray source was cobalt radiation.

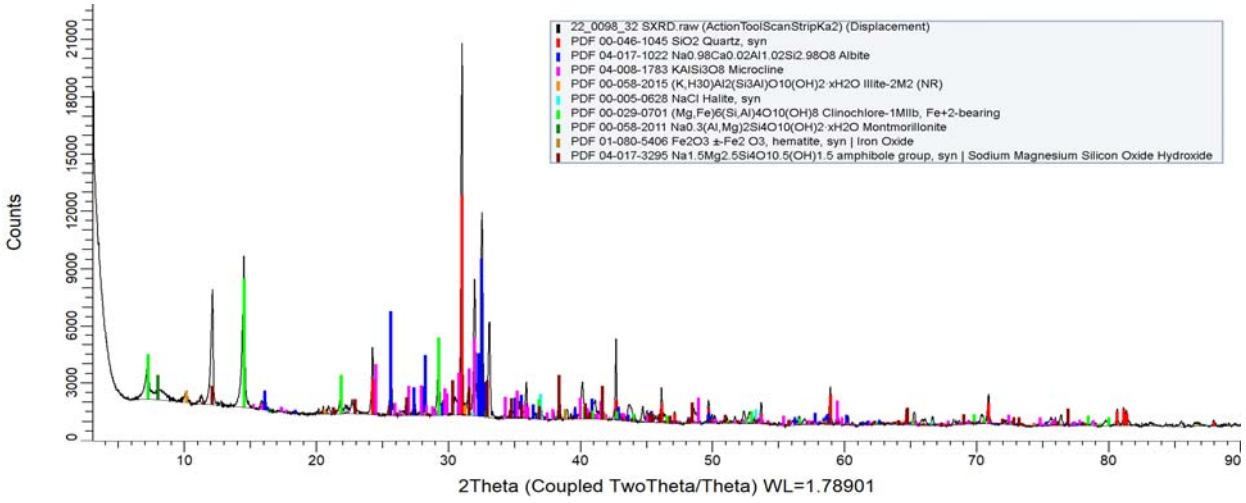
No standards were used in the quantification process. The concentrations were calculated using the normalized reference intensity ratio method where the intensity of the 100% peak divided by the published I/Ic value for each mineral phase is summed and the relative percentages of each phase calculated based on the relative contribution to the sum. This method allows for slight attention to be paid to preferred orientation but is limited in considering other factors including but not limited to; variable crystallinity, alteration, fluorescence, substitution and lattice strain.

Summary

The phases are listed in order of interpreted concentration:

Crystalline mineral phase	Concentration (%)	ICDD match probability
Albite (Na0.98Ca0.02Al1.02Si2.98O8)	32	High
Clinochlore-1MIIb, Fe+2-bearing ((Mg,Fe)6(Si,Al)4O10(OH)8)	25	High
Microcline (KAlSi3O8)	18	Medium
Quartz, syn (SiO2)	9	Medium
Amphibole group, syn | Sodium Magnesium Silicon Oxide Hydroxide (Na1.5Mg2.5Si4O10.5(O	9	Low
Montmorillonite (Na0.3(Al,Mg)2Si4O10(OH)2·xH2O)	3	Medium
Illite-2M2 (NR) ((K,H30)Al2(Si3Al)O10(OH)2·xH2O)	1	Low
Halite, syn (NaCl)	1	Low
Hematite, syn | Iron Oxide (Fe2O3)	Trace	Low

The ICDD match probability is reported as an indication as to how well the peak positions and relative intensities for the sample matched those in the published literature (www.icdd.org) for that particular compound.



Analyst: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Reported: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Approved: Ian Davies, B.Sc.(Chemistry)

5 Alvan St,
Mount Lawley
WA 6050

Client:	Land and Water Consulting	**Date received:**	21/01/2022
Client address:	Level 7, 191 St Georges Terrace Perth WA 6000	**Date analysed:**	4/02/2022
Job number:	22_0098	**Date reported:**	4/02/2022
Lab ID:	22_0098_1		
Client ID:	MW12 5.50m		
Analysis :	Semi-quantitative XRD analysis		
Revision number:	0		
Comments:	None		

Sample preparation

The sample was supplied by the client to Microanalysis Australia on 21/01/2022 for the above mentioned analyses. A representative sub-sample was removed and lightly ground such that 90% was passing 20 µm. Grinding to this size helps eliminate preferred orientation.

Analysis

Only crystalline material present in the sample will give peaks in the XRD scan. Amorphous (non-crystalline) material will add to the background. The search match software used was Eva 4.3. An up-to-date ICDD card set was used. The X-ray source was cobalt radiation.

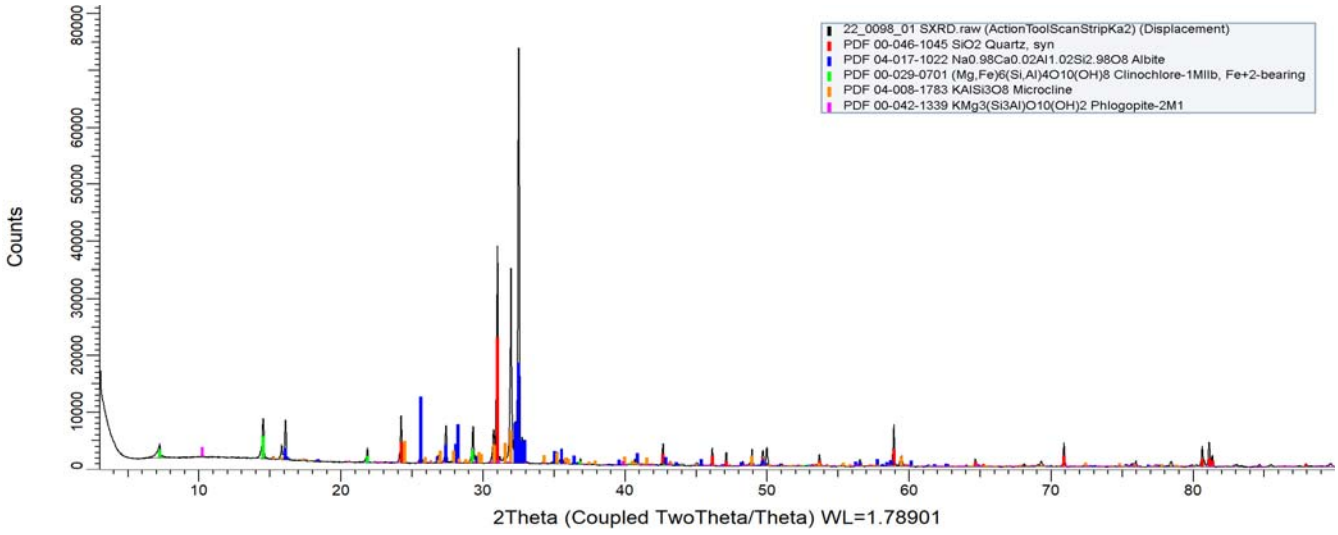
No standards were used in the quantification process. The concentrations were calculated using the normalized reference intensity ratio method where the intensity of the 100% peak divided by the published I/Ic value for each mineral phase is summed and the relative percentages of each phase calculated based on the relative contribution to the sum. This method allows for slight attention to be paid to preferred orientation but is limited in considering other factors including but not limited to; variable crystallinity, alteration, fluorescence, substitution and lattice strain.

Summary

The phases are listed in order of interpreted concentration:

Crystalline mineral phase	Concentration (%)	ICDD match probability
Albite (Na0.98Ca0.02Al1.02Si2.98O8)	55	High
Microcline (KAlSi3O8)	21	High
Quartz, syn (SiO2)	14	High
Clinochlore-1MIIb, Fe+2-bearing ((Mg,Fe)6(Si,Al)4O10(OH)8)	8	Medium
Phlogopite-2M1 (KMg3(Si3Al)O10(OH)2)	2	Low

The ICDD match probability is reported as an indication as to how well the peak positions and relative intensities for the sample matched those in the published literature (www.icdd.org) for that particular compound.



Analyst:	Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Reported:	Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Approved:	Ian Davies, B.Sc.(Chemistry)

5 Alvan St,
Mount Lawley
WA 6050

Client:	Land and Water Consulting	**Date received:**	21/01/2022
Client address:	Level 7, 191 St Georges Terrace Perth WA 6000	**Date analysed:**	4/02/2022
Job number:	22_0098	**Date reported:**	4/02/2022
Lab ID:	22_0098_27		
Client ID:	MBH019 6-9m		
Analysis :	Semi-quantitative XRD analysis		
Revision number:	0		
Comments:	None		

Sample preparation

The sample was supplied by the client to Microanalysis Australia on 21/01/2022 for the above mentioned analyses. A representative sub-sample was removed and lightly ground such that 90% was passing 20 µm. Grinding to this size helps eliminate preferred orientation.

Analysis

Only crystalline material present in the sample will give peaks in the XRD scan. Amorphous (non-crystalline) material will add to the background. The search match software used was Eva 4.3. An up-to-date ICDD card set was used. The X-ray source was cobalt radiation.

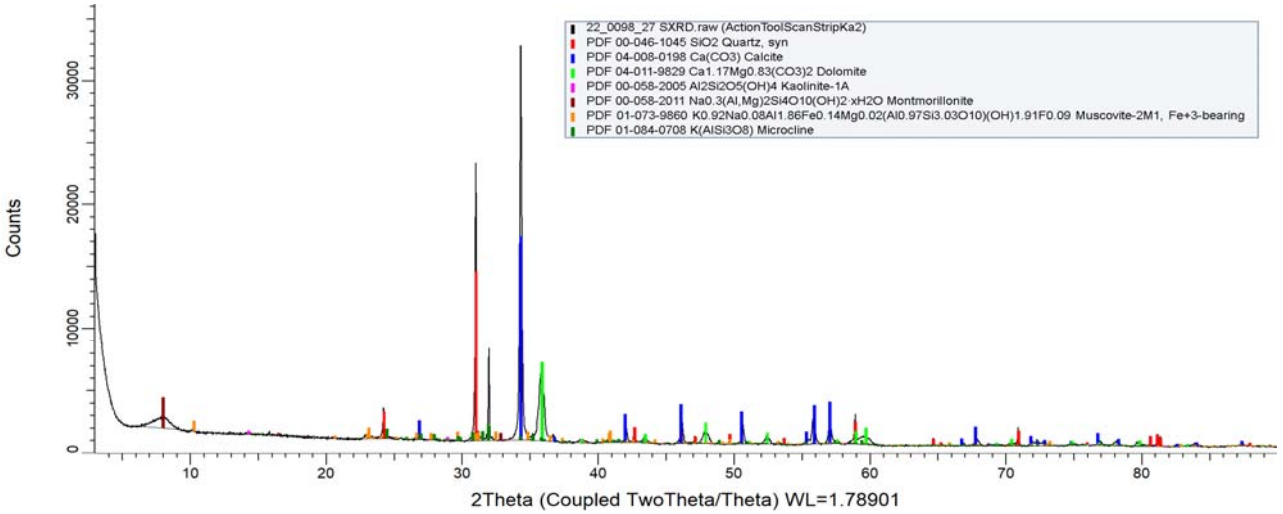
No standards were used in the quantification process. The concentrations were calculated using the normalized reference intensity ratio method where the intensity of the 100% peak divided by the published I/Ic value for each mineral phase is summed and the relative percentages of each phase calculated based on the relative contribution to the sum. This method allows for slight attention to be paid to preferred orientation but is limited in considering other factors including but not limited to; variable crystallinity, alteration, fluorescence, substitution and lattice strain.

Summary

The phases are listed in order of interpreted concentration:

Crystalline mineral phase	Concentration (%)	ICDD match probability
Calcite (Ca(CO3))	27	High
Quartz, syn (SiO2)	21	High
Dolomite (Ca1.17Mg0.83(CO3)2)	13	Medium
Montmorillonite (Na0.3(Al,Mg)2Si4O10(OH)2·xH2O)	13	Medium
Muscovite-2M1, Fe+3-bearing (K0.92Na0.08Al1.86Fe0.14Mg0.02(Al0.97Si3.03O10)(OH)1.91	13	Medium
Microcline (K(AlSi3O8))	12	Medium
Kaolinite-1A (Al2Si2O5(OH)4)	3	Low

The ICDD match probability is reported as an indication as to how well the peak positions and relative intensities for the sample matched those in the published literature (www.icdd.org) for that particular compound.



Analyst: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Reported: Dr Rhys Tilbury, B.Sc.(Nanotechnology)(Hons), PhD(Chemistry)
Approved: Ian Davies, B.Sc.(Chemistry)

APPENDIX C – DATA QUALITY ASSESSMENT

Data Quality Assessment

The quality of analytical data produced for this project has been assessed with reference to the following issues:

- Sampling technique;
- Preservation and storage of samples upon collection and during transport to the laboratory;
- Sample holding times;
- Analytical procedures;
- Laboratory limits of reporting;
- Field duplicate agreement;
- Laboratory QA/QC procedures; and
- The occurrence of apparently unusual or anomalous results.

Relative Percentage Differences (RPDs) were assessed where the reported concentrations were greater than the laboratory LOR in accordance with the following acceptance criteria (as referenced in Australian Standard 4482.1-2005):

- Where both reported concentrations are greater than 20 times the LOR: RPD% <30%;
- Where the higher of the two concentrations is between 10 and 20 times the LOR: RPD% <50%; and
- Where both concentrations are less than 10 times the LOR: RPD% has no limit.

The overall assessment of data quality was undertaken in accordance with the Data Quality Objective (DQO) and Data Quality Indicator (DQI) processes.

Laboratory QA/QC procedures and results are detailed in the certified laboratory result reports. A summary of the data quality assessment including tabulated RPDs is presented in this appendix.

Quality assurance and control for soil is presented in Table 1-1.

It was considered that laboratory data collected during this program of works is suitably robust for the purposes of the assessment, subject to the comments and limitations outlined in the data quality assessment tables and laboratory reports. It is considered that quality control information indicates an acceptable degree of QA/QC information was collected and reported providing confidence in the accuracy and precision of reported results subject to the limitations discussed.

Relative Percentage Difference Tables

Data Quality Assessment

Summary of Relative Percentage Differences (RPD's)

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Sample ID	TP059_0	TP059 - ASS4	RPD%	TP074_0	TP074 - ASS3	RPD%	TP055_0	TP055_0	RPD%	TP055 - ASS3	RPD%	TP051_0	TP051_0	RPD%
		Lab Name	Eurofins	ChemCentre		Eurofins	ChemCentre		Eurofins	Eurofins		ChemCentre		Eurofins	Eurofins	
		Lab Report	829635	21S1290		829635	21S1290		829635	829635		21S1290		829635	829635	
		Date	19/08/2021	19/08/2021		24/08/2021	24/08/2021		25/08/2021	25/08/2021		25/08/2021		25/08/2021	25/08/2021	
		Duplicate	Primary	Inter-Laboratory		Primary	Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory		Primary	Intra-Laboratory	
Analyte	**Units**	**LOR**														
PASS Indicators																
pHf	mg/kg	5	**8.9**	**8.9**	***0***	**9.1**	**9.1**	***0***	**9.2**	**9.1**	***1***	**8.9**	***3***	**9.4**	**9.4**	***0***
pHfox	mg/kg	1	**8.3**	**8.3**	***0***	**9.1**	**8.4**	***8***	**9.1**	**8.6**	***6***	**8.2**	***10***	**9.4**	**9.9**	***5***
pHfoxr	mg/kg	2	**4**	**4**	***0***	**4**	**4**	***0***	**4**	**4**	***0***	**4**	***0***	**4**	**4**	***0***
Nutrients																
Nitrate & Nitrite (as N)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (as N)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Nitrogen (as N)*	%	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cations & Anions																
Calcium	mg/kg	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (as SO4)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Metals																
Iron	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Parameters																
% Moisture	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec	mS/cm	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable																
Exchangeable Acidicity	cmolc/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Magnesium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Potassium	cmolc/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Sodium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
<' denotes concentration is less than the Limits of Reporting (LOR)

Exceedance of RPD% Criterion of 30% of mean concentration where both concentrations >20 x EQL
Exceedance of RPD% Criterion of 50% of mean concentration where higher concentration 10-20 x EQL

Data Quality Assessment

Summary of Relative Percentage Differences (RPD's)

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Sample ID	TP051 - ASS3		TP181_0	TP181_0		TP181		TP005_2.5	TP005_2.5		TP005	
		Lab Name	ChemCentre		Eurofins	Eurofins		ChemCentre		Eurofins	Eurofins		ChemCentre	
		Lab Report	21S1290	RPD%	829534	829534	RPD%	21S1518	RPD%	8/03/4171	8/03/4171	RPD%	21S1518	RPD%
		Date	25/08/2021		10/09/2021			10/09/2021		6/09/2021	6/09/2021		6/09/2021	
		Duplicate	Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory	
Analyte	**Units**	**LOR**												
PASS Indicators														
pHf	mg/kg	5	**9.1**	***3***	**9.7**	**9.7**	***0***	**8.4**	***14***	**9.3**	**9.3**	***0***	**7.9**	***16***
pHfox	mg/kg	1	**8.6**	***9***	**9.8**	**9.6**	***2***	**9.1**	***7***	**9.6**	**9.4**	***2***	**9**	***6***
pHfoxr	mg/kg	2	**4**	***0***	**4**	**4**	***0***	**4**	***0***	**4**	**4**	***0***	**4**	***0***
Nutrients														
Nitrate & Nitrite (as N)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (as N)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-
Total Nitrogen (as N)*	%	10	-	-	-	-	-	-	-	-	-	-	-	-
Cations & Anions														
Calcium	mg/kg	5.0	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (as SO4)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-
Other Metals														
Iron	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-
General Parameters														
% Moisture	%	1	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec	mS/cm	0.01	-	-	-	-	-	-	-	-	-	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable														
Exchangeable Acidicity	cmolc/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Magnesium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Potassium	cmolc/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Sodium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
'<' denotes concentration is less than the Limits of Reporting (LOR)

Exceedance of RPD% Criterion of 30% of mean concentration where both
Exceedance of RPD% Criterion of 50% of mean concentration where high

Data Quality Assessment

Summary of Relative Percentage Differences (RPD's)

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Sample ID	TP169_0	TP169_0		TP169		TP191_0	TP191_0		TP191		TP082_0	TP082_0		TP082	
		Lab Name	Eurofins	Eurofins		ChemCentre		Eurofins	Eurofins		ChemCentre		Eurofins	Eurofins		ChemCentre	
		Lab Report	8/03/4171	8/03/4171	RPD%	21S1518	RPD%	829534	829534	RPD%	21S1518	RPD%	829534	829534	RPD%	21S1518	RPD%
		Date	6/09/2021	6/09/2021		6/09/2021		1/09/2021	1/09/2021		1/09/2021		31/08/2021	31/08/2021		29/08/2021	
		Duplicate	Primary	Intra-Laboratory		Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory	
Analyte	**Units**	**LOR**															
PASS Indicators																	
pHf	mg/kg	5	**8.1**	**8.4**	***4***	**7.9**	***2***	**9**	**7**	***25***	**8.4**	***7***	**9.3**	**9.3**	***0***	**8.2**	***13***
pHfox	mg/kg	1	**9.2**	**9.1**	***1***	**8.5**	***8***	**9**	**9.1**	***1***	**8.6**	***5***	**9.2**	**9.5**	***3***	**8.7**	***6***
pHfoxr	mg/kg	2	**4**	**4**	***0***	**4**	***0***	**4**	**4**	***0***	**4**	***0***	**4**	**4**	***0***	**4**	***0***
Nutrients																	
Nitrate & Nitrite (as N)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (as N)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Nitrogen (as N)*	%	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cations & Anions																	
Calcium	mg/kg	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (as SO4)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Metals																	
Iron	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Parameters																	
% Moisture	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec	mS/cm	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable																	
Exchangeable Acidicity	cmolc/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Magnesium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Potassium	cmolc/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Sodium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
'<' denotes concentration is less than the Limits of Reporting (LOR)

Exceedance of RPD% Criterion of 30% of mean concentration where both
Exceedance of RPD% Criterion of 50% of mean concentration where high

Summary of Relative Percentage Differences (RPD's)

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Sample ID	TP189_0	TP189	RPD%	TP085_0	TP085_0	RPD%	TP085	RPD%	TP087_0	TP087_0	RPD%	TP087	RPD%
		Lab Name	Eurofins	ChemCentre		Eurofins	Eurofins		ChemCentre		Eurofins	Eurofins		ChemCentre	
		Lab Report	829534	21S1518		829534	829534		21S1518		829534	829534		21S1518	
		Date	31/08/2021	31/08/2021		29/08/2021	29/08/2021		29/08/2021		29/08/2021	29/08/2021		29/08/2021	
		Duplicate	Primary	Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory	
Analyte	**Units**	**LOR**													
PASS Indicators															
pHf	mg/kg	5	**9.3**	**8.3**	***11***	**9.2**	**9**	***2***	**8.6**	***7***	**9**	**9**	***0***	**8.2**	***9***
pHfox	mg/kg	1	**8.8**	**8.4**	***5***	**9.1**	**9.1**	***0***	**8.5**	***7***	**8.3**	**8.5**	***2***	**8**	***4***
pHfoxr	mg/kg	2	**4**	**4**	***0***	**4**	**4**	***0***	**4**	***0***	**4**	**4**	***0***	**4**	***0***
Nutrients															
Nitrate & Nitrite (as N)	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	mg/kg	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphorus	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen (as N)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Nitrogen (as N)*	%	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Cations & Anions															
Calcium	mg/kg	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/kg	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate (as SO4)	mg/kg	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Metals															
Iron	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	20	-	-	-	-	-	-	-	-	-	-	-	-	-
General Parameters															
% Moisture	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec	mS/cm	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	%	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable															
Exchangeable Acidicity	cmolc/kg	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Calcium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Magnesium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Potassium	cmolc/kg	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Exchangeable Sodium	cmolc/kg	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
<' denotes concentration is less than the Limits of Reporting (LOR)

Exceedance of RPD% Criterion of 30% of mean concentration where both
Exceedance of RPD% Criterion of 50% of mean concentration where high

Summary of Relative Percentage Differences (RPD's)

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Sample ID	TP036_0	TP036_0	RPD%	TP036	RPD%	SS108	DUP1	RPD%	DUP1	RPD%	SS107	DUP2	RPD%	DUP2	RPD%
		Lab Name	Eurofins	Eurofins		ChemCentre		Eurofins	Eurofins		ALS		Eurofins	Eurofins		ALS	
		Lab Report	829534	829534		2151518		879589	879589		EP2204125		879589	879589		EP2204125	
		Date	27/08/2021	27/08/2021		27/08/2021		30/03/2022	30/03/2022		30/03/2022		30/03/2022	30/03/2022		30/03/2022	
		Duplicate	Primary	Intra-Laboratory		Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory		Primary	Intra-Laboratory		Inter-Laboratory	
Analyte	**Units**	**LOR**															
PASS Indicators																	
pHf	mg/kg	5	**9.9**	**9.3**	***6***	**7.9**	***22***	**-**	**-**	-	**-**	-	**-**	**-**	-	**-**	-
pHfox	mg/kg	1	**9.8**	**9**	***9***	**8.3**	***17***	**-**	**-**	-	**-**	-	**-**	**-**	-	**-**	-
pHfoxr	mg/kg	2	**4**	**4**	***0***	**4**	***0***	**-**	**-**	-	**-**	-	**-**	**-**	-	**-**	-
Nutrients																	
Nitrate & Nitrite (as N)	mg/kg	5	**-**	**-**	**-**	**-**	**-**	**3**	**3.5**	***15***	**2.4**	***22***	**26**	**13**	***67***	**17.1**	***41***
Nitrate	mg/kg	1	**-**	**-**	**-**	**-**	**-**	**2.8**	**3.2**	***13***	**2.3**	***20***	**25**	**12**	***70***	**16.6**	***40***
Phosphorus	mg/kg	5	**-**	**-**	**-**	**-**	**-**	**110**	**91**	***19***	**150**	***31***	**160**	**120**	***29***	**149**	***7***
Total Kjeldahl Nitrogen (as N)	mg/kg	10	**-**	**-**	**-**	**-**	**-**	**360**	**330**	***9***	**370**	***3***	**370**	**330**	***11***	**340**	***8***
Total Nitrogen (as N)*	%	10	**-**	**-**	**-**	**-**	**-**	**360**	**330**	***9***	**370**	***3***	**400**	**340**	***16***	**360**	***11***
Cations & Anions																	
Calcium	mg/kg	5.0	-	-	-	-	-	**9700**	**13000**	***29***	**6950**	***33***	**21000**	**12000**	***55***	**20200**	***4***
Magnesium	mg/kg	5	-	-	-	-	-	**5500**	**6300**	***14***	**6490**	***17***	**7700**	**6100**	***23***	**8660**	***12***
Chloride	mg/kg	5	-	-	-	-	-	**< 10**	**630**	**-**	**<10**	**-**	**8000**	**3300**	***83***	**4870**	***49***
Sulphate (as SO4)	mg/kg	10	-	-	-	-	-	**< 10**	**< 10**	**-**	**<10**	**-**	**130**	**80**	***48***	**110**	***17***
Other Metals																	
Iron	mg/kg	20	-	-	-	-	-	**35000**	**42000**	***18***	**39500**	***12***	**38000**	**36000**	***5***	**36000**	***5***
Manganese	mg/kg	20	-	-	-	-	-	**770**	**870**	***12***	**726**	***6***	**1600**	**1500**	***6***	**702**	***78***
General Parameters																	
% Moisture	%	1	-	-	-	-	-	**12**	**7.9**	***41***	**9.7**	***21***	**11**	**9.2**	***18***	**10.4**	***6***
Conductivity (1:5 aqueous extract at 25°C as rec	mS/cm	0.01	-	-	-	-	-	**0.11**	**0.11**	***0***	**0.056**	***65***	**4.2**	**2.4**	***55***	**2.86**	***38***
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	-	-	-	-	-	**9.3**	**9.3**	***0***	**9**	***3***	**8.8**	**9.2**	***4***	**9.1**	***3***
Cation Exchange Capacity	meq/100g	0.05	-	-	-	-	-	**29**	**22**	***27***	**22**	***27***	**54**	**41**	***27***	**11.4**	***130***
Total Organic Carbon	%	0.05	-	-	-	-	-	**0.31**	**0.3**	***3***	**0.3**	***3***	**0.35**	**0.31**	***12***	**0.36**	***3***
Exchangeable																	
Exchangeable Acidicity	cmolc/kg	0.1	-	-	-	-	-	**< 0.1**	**< 0.1**	**-**		**-**	**< 0.1**	**< 0.1**	**-**		**-**
Exchangeable Calcium	cmolc/kg	0.2	-	-	-	-	-	**23**	**17**	***30***	**16**	***36***	**26**	**22**	***17***	**22.2**	***16***
Exchangeable Magnesium	cmolc/kg	0.2	-	-	-	-	-	**4.5**	**3.7**	***20***	**4.3**	***5***	**6.2**	**4.4**	***34***	**3.8**	***48***
Exchangeable Potassium	cmolc/kg	0.05	-	-	-	-	-	**0.91**	**0.87**	***4***	**0.8**	***13***	**0.79**	**0.77**	***3***	**0.6**	***27***
Exchangeable Sodium	cmolc/kg	0.2	-	-	-	-	-	**0.7**	**0.5**	***33***	**0.8**	***13***	**21**	**14**	***40***	**3.4**	***144***

Notes:
'<' denotes concentration is less than the Limits of Reporting (LOR)

Exceedance of RPD% Criterion of 30% of mean concentration where both
Exceedance of RPD% Criterion of 50% of mean concentration where high

Data Quality Assessment

Summary of Relative Percentage Differences (RPD's)

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Sample ID	SS117	DUP3	RPD%	DUP3	RPD%
		Lab Name	Eurofins	Eurofins		ALS	
		Lab Report	879589	879589		EP2204125	
		Date	30/03/2022	30/03/2022		30/03/2022	
		Duplicate	Primary	Intra-Laboratory		Inter-Laboratory	
Analyte	**Units**	**LOR**					
PASS Indicators							
pHf	mg/kg	5	-	-	-	-	-
pHfox	mg/kg	1	-	-	-	-	-
pHfoxr	mg/kg	2	-	-	-	-	-
Nutrients							
Nitrate & Nitrite (as N)	mg/kg	5	**3.3**	**11**	***108***	**3.1**	***6***
Nitrate	mg/kg	1	**3.2**	**11**	***110***	**3.1**	***3***
Phosphorus	mg/kg	5	**84**	**95**	***12***	**106**	***23***
Total Kjeldahl Nitrogen (as N)	mg/kg	10	**550**	**450**	***20***	**510**	***8***
Total Nitrogen (as N)*	%	10	**550**	**460**	***18***	**510**	***8***
Cations & Anions							
Calcium	mg/kg	5.0	**25000**	**25000**	***0***	**37700**	***41***
Magnesium	mg/kg	5	**5900**	**5900**	***0***	**5520**	***7***
Chloride	mg/kg	5	**< 10**	**< 10**	**-**	**<10**	**-**
Sulphate (as SO4)	mg/kg	10	**< 10**	**< 10**	**-**	**<10**	**-**
Other Metals							
Iron	mg/kg	20	**33000**	**33000**	***0***	**35000**	***6***
Manganese	mg/kg	20	**560**	**550**	***2***	**404**	***32***
General Parameters							
% Moisture	%	1	**7.7**	**6.7**	***14***	**6.7**	***14***
Conductivity (1:5 aqueous extract at 25°C as rec	mS/cm	0.01	**0.1**	**0.1**	***0***	**0.176**	***55***
pH (1:5 Aqueous extract at 25°C as rec.)	pH Units	0.1	**8.9**	**8.9**	***0***	**8.9**	***0***
Cation Exchange Capacity	meq/100g	0.05	**31**	**32**	***3***	**39.4**	***24***
Total Organic Carbon	%	0.05	**0.33**	**0.4**	***19***	**0.42**	***24***
Exchangeable							
Exchangeable Acidicity	cmolc/kg	0.1	**< 0.1**	**< 0.1**	**-**		**-**
Exchangeable Calcium	cmolc/kg	0.2	**24**	**25**	***4***	**33.9**	***34***
Exchangeable Magnesium	cmolc/kg	0.2	**5.3**	**5.5**	***4***	**4.2**	***23***
Exchangeable Potassium	cmolc/kg	0.05	**1.1**	**1.3**	***17***	**1**	***10***
Exchangeable Sodium	cmolc/kg	0.2	**0.2**	**0.2**	***0***	**0.3**	***40***

Notes:
'<' denotes concentration is less than the Limits of Reporting (LOR)

Exceedance of RPD% Criterion of 30% of mean concentration where both
Exceedance of RPD% Criterion of 50% of mean concentration where high

Data Quality Assessment

Summary of Relative Percentage Differences (RPD's)

Project: Eramurra Salt Project
Client: Leichhardt Industries Pty Ltd
Job Number: W-AO-02

		Sample ID	SS108	DUP1		SS107	DUP2		SS/SW08	DUP3	
		Lab Name	Eurofins	Eurofins		Eurofins	Eurofins		Eurofins	Eurofins	
		Lab Report	879589	879589	RPD%	879589	879589	RPD%	879589	879589	RPD%
		Date	30/03/2022	30/03/2022		30/03/2022	30/03/2022		30/03/2022	30/03/2022	
		Duplicate	Primary	Intra-Laboratory		Primary	Intra-Laboratory		Primary	Intra-Laboratory	
Analyte	**Units**	**LOR**									
Soil Description											
Clay	%	0.01	**10.7**	**23.8**	***76***	**22.5**	**12.3**	***59***	**15.0**	**12.4**	***20***
Silt	%	0.01	**47.4**	**60.6**	***24***	**42.4**	**31.9**	***28***	**39.3**	**46.5**	***17***
Fine sand	%	0.01	**11.5**	**6.1**	***62***	**15.2**	**16.6**	***9***	**15.9**	**9.6**	***50***
Medium sand	%	0.01	***0.7***	***0.3***	***89***	***1.9***	***3.4***	***56***	***9.5***	***5.1***	***60***
Coarse sand	%	0.01	***9.6***	***7.0***	***31***	***14.8***	***34.0***	***79***	***17.6***	***21.7***	***21***
Gravel	%	0.01	***20.0***	***2.2***	***160***	***3.2***	***1.8***	***57***	***2.7***	***4.7***	***55***

Notes:
<' denotes concentration is less than the Limits of Reporting (LOR)

Exceedance of RPD% Criterion of 30% of mean concentration where both concentrations >20 x EQL
Exceedance of RPD% Criterion of 50% of mean concentration where higher concentration 10-20 x EQL

Table 1-1 Summary of Quality Assurance and Control

Component	Frequency	Frequency Acceptable?	Acceptance Criteria	Criteria met?	Reference/ Appendix
Field QC					
Field Replicate (intra)	1 in 20 primary samples or 1 per batch.	The duplicate frequency of 1 in 20 samples was not met for all analytes (frequencies for some analysed were closer to 1 in 40 samples). During the first phase of the soil investigation program (August, September and December 2021) samples were collected by CMW/ Leichhardt with only the laboratory analysis managed by LWC. For this scope of works, duplicates were undertaken for PASS indicators only. Noting the baseline nature of this assessment, the breach was not considered to significantly impact upon the interpretation of results. This was supported by the relatively high level of laboratory QAQC demonstrated which included duplicate assessment. Note that only intra-laboratory duplicates were completed for the particle size distribution. Given the nature of this assessment (physical rather than chemical) this was not considered significant.	RPD <30% if both results >20 LOR RPD <50% if the higher of the two results <>10-20 LOR No limit for RPD if both results <10 LOR	**Eurofins Report 879589-S** The RPDs between the primary and intra-laboratory duplicate (DUP1) exceeded the threshold criteria for the following analytes: ▪ Clay (76%) ▪ Fine Sand (62%) ▪ Medium Sand (89%) ▪ Coarse Sand (31%) ▪ Gravel (160%) The RPDs between the primary and intra-laboratory duplicate (DUP2) exceeded the threshold criteria for the following analytes: ▪ Nitrate as N (70%) ▪ Calcium (55%) ▪ Chloride (83%) ▪ Sulphate (as SO4) (48%) ▪ Conductivity (55%) ▪ Exchangeable Magnesium (34%) ▪ Exchangeable Sodium (40%) ▪ Clay (59%) ▪ Medium Sand (56%) ▪ Coarse Sand (79%) ▪ Gravel (57%) The RPDs between the primary and intra-laboratory duplicate (DUP3) exceeded the threshold criteria for the following analytes: ▪ Nitrate as N (110%) ▪ Fine Sand (50%) ▪ Medium Sand (60%) ▪ Gravel (55%)	At rear

Component	Frequency	Frequency Acceptable?	Acceptance Criteria	Criteria met?	Reference/ Appendix
				The above were not considered to significantly impact upon the overall interpretation of results due to one or more of the following: ▪ The exceedance was considered to be minor (i.e. between 30 and 50%); ▪ The primary sample utilised for interpretation reported the highest or most conservative concentration; ▪ For exchangeable cations, the aggregate cation exchange capacity met the RPD criteria; and ▪ For the PSD results, the RPD for the dominant soil type was within the acceptable criteria.	
Field Replicate (inter)	1 in 20 primary samples or 1 per batch.		RPD <30% if both results >20 LOR RPD <50% if the higher of the two results <>10-20 LOR No limit for RPD if both results <10 LOR	**ALS Report ES2206765/ Eurofins Report 866863** The RPDs between the primary and inter-laboratory duplicate (DUP1) exceeded the threshold criteria for the following analytes: ▪ Conductivity (65%) ▪ Exchangeable Calcium (36%) The RPDs between the primary and inter-laboratory duplicate (DUP2) exceeded the threshold criteria for the following analytes: ▪ Nitrate as N (40%) ▪ Chloride (49%) ▪ Manganese (78%) ▪ Conductivity (38%) ▪ CEC (130%) ▪ Exchangeable Magnesium (48%) ▪ Exchangeable Sodium (144%) The RPDs between the primary and inter-laboratory duplicate (DUP3) exceeded the threshold criteria for the following analytes: ▪ calcium (41%) ▪ Manganese (32%) ▪ Exchangeable Calcium (34%) The above were not considered to significantly impact upon the overall interpretation of results due to the following:	At rear

Component	Frequency	Frequency Acceptable?	Acceptance Criteria	Criteria met?	Reference/ Appendix
				▪ The exceedance was considered to be minor (i.e. between 30 and 50%); ▪ The primary sample utilised for interpretation reported the highest or most conservative concentration; and ▪ For exchangeable cations, the aggregate cation exchange capacity generally met the RPD criteria.	
Rinsate Blanks	1 per day, per matrix, per item of equipment	No rinsate blanks required as samples were collected with dedicated disposable gloves mitigating the potential for cross contamination.	<LOR	N/A	N/A
Trip Blanks (water samples for volatile organic marker compounds only – to assess potential for contamination of the samples by volatile compounds during transfer to the laboratory)	1 per esky or 1 per laboratory batch.	Not required as volatile analysis (hydrocarbons) was not conducted.	<LOR	N/A	N/A
Laboratory QC					
Primary Laboratory Batch Reference					829438 856518 820498 834932 829368 829534 829635 849207 852134 879589 882083

Component	Frequency	Frequency Acceptable?	Acceptance Criteria	Criteria met?	Reference/ Appendix
Secondary Laboratory Batch Reference					EP2204125 21S1290 21S1518
Analysis undertaken in specific holding times			Variable depending on the chemical substance.	**Eurofins Report 829438-S** The holding time for all samples analysed was breached for pH, conductivity and nutrients (nitrate-N, phosphorous, NOx-N, total kjeldahl nitrogen and total nitrogen), chloride and moisture by 18 days. All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 879589-S** The holding time for all samples analysed was breached for pH, conductivity and nutrients (nitrate-N, phosphorous, NOx-N, total kjeldahl nitrogen and total nitrogen) by 5-6 days. All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 852134-S** The holding time for all samples analysed was breached for pH, conductivity, chloride, CEC, nutrients (nitrate & nitrite (as N), total kjeldahl nitrogen, TOC, phosphorous and sulphate (as SO4)) and moisture by 116 (7 day holding time) and 137 days (28 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 849207-S** The holding time for all samples analysed was breached for pH, conductivity, chloride, CEC, nutrients (nitrate & nitrite (as N), total kjeldahl nitrogen, TOC, phosphorous and sulphate (as SO4)) and moisture by approximately 110 days (7 day holding time), 103 days (14 day holding time) and 137 days (28 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is	Appendix A

Component	Frequency	Frequency Acceptable?	Acceptance Criteria	Criteria met?	Reference/ Appendix
				not considered to significantly impact on the interpretation of the results. **Eurofins Report 829635-S** The holding time for all samples analysed was breached for 'ASS Field pH Test' by 36-40 days (7 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 829534-S** The holding time for all samples analysed was breached for 'ASS Field pH Test' by 8-33 days (7 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 829368-S** The holding time for all samples analysed was breached for 'ASS Field pH Test' by 4-6 days (7 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 834932-S** The holding time for all samples analysed was breached for 'extraneous material', 'chromium suite' and moisture by 22-29 days (42 day holding time) and 50-57 days (14 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 820498-S** The holding time for all samples analysed was breached for 'ASS Field pH Test' by 1-10 days (7 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 856518-S** The holding time for all samples analysed was breached for pH, conductivity, chloride, CEC, heavy metals, 'ASS Field pH Test' and nutrients (nitrate & nitrite (as N), total kjeldahl nitrogen, TOC, sulphate	

Component	Frequency	Frequency Acceptable?	Acceptance Criteria	Criteria met?	Reference/ Appendix
				(as SO4)) and moisture by approximately 24 days (7 day holding time), 17 days (14 day holding time) and 3 days (28 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **Eurofins Report 829438-S** The holding time for all samples analysed was breached for pH, conductivity, chloride, heavy metals, 'ASS Field pH Test' and nutrients (nitrate & nitrite (as N), total kjeldahl nitrogen, TOC, sulphate (as SO4)) and moisture by approximately 36 days (7 day holding time), 29 days (14 day holding time) and 15 days (28 day holding time). All samples were frozen immediately following collection/prior to analysis, therefore, holding times as stated by the laboratory are no longer relevant. This is not considered to significantly impact on the interpretation of the results. **ALS Report EP2204125** Samples DUP1, DUP2 and DUP3 breached holding times for pH, conductivity, and Nitrite as N by 5, 5 and 3 days, respectively. Given the result reported for both samples are generally consistent with the intra laboratory duplicate, the breach is not considered to impact upon interpretation of the results.	
Method blanks	1 analysed per process batch of 20 samples.	✓	<LOR	✓	Appendix A
Duplicates	1 in 10 primary samples or 2 per batch of 20 samples.	✓	RPD <50% if results >10 LOR	**Eurofins Report 879589-S** The calcium (45%) and manganese (22%) duplicate RPDs failed the 20% limit, however the RPD reported passed Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review. Therefore, this was not considered to significantly impact upon the interpretation of results. **Eurofins Report 849207-S** The total organic carbon (42%) duplicate RPD failed the 30% limit, however the RPD reported passed Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review. Therefore, this was not considered to significantly impact upon the interpretation of results. **Eurofins Report 856518-S**	Appendix A

Component	Frequency	Frequency Acceptable?	Acceptance Criteria	Criteria met?	Reference/ Appendix
				The total organic carbon (38%) duplicate RPD failed the 30% limit, however the RPD reported passed Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review. Therefore, this was not considered to significantly impact upon the interpretation of results.	
Matrix spikes	1 analysed per process batch of 20 samples.	✓	Recovery 70 - 130%	**Eurofins Report 852134-S** Sample SSA061 failed the laboratory acceptance limits for Total Kjeldahl Nitrogen (69%). This is considered a minor breach of the recovery criterion of 70 – 130%. Therefore, this breach was not considered to significantly impact upon the interpretation of results. **Eurofins Report 849207-S** Sample SSA17 failed the laboratory acceptance limits for sulphate as sulphate as SO4 (46%). Therefore, this breach was not considered to significantly impact upon the interpretation of results. **Eurofins Report 856518-S** An 'non-client parent' sample failed the laboratory acceptance limits for iron (128%). This is considered a minor breach of the recovery criterion of 75 – 125%. Therefore, this breach was not considered to significantly impact upon the interpretation of results.	Appendix A
Laboratory control sample spikes	1 analysed per process batch of 20 samples.	✓	Recovery 70 - 130%	✓	Appendix A
Surrogate spikes	Each analysis undertaken by GC-MS (all organics except TRH >C_{10}).	✓	Recovery 50 – 150%	✓	Appendix A

APPENDIX D – STATEMENT OF LIMITATIONS

STATEMENT OF LIMITATIONS & IMPORTANT INFORMATION REGARDING YOUR REPORT

INTRODUCTION

This report has been prepared by Land & Water Consulting for you, as Land & Water Consulting's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Land & Water Consulting may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Land & Water Consulting has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

No warranty or guarantee of the site conditions is intended.

This report was prepared for the sole use of you, the Client and may not contain sufficient information for purposes of other parties or for other uses. Any reliance on this report by third parties shall be at such parties sole risk. This report shall only be presented in full and may not be used to support any other objectives than those set out in the report, except where written approval with comments are provided by Land & Water Consulting.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

LIMITATIONS OF THE REPORT

The scope of works undertaken and the report prepared to complete the assessment was in accordance with the information provided by the client and the specifications for works required under the contract. As such, works undertaken and statements made are based on those specifications (such as levels of risks and significance of any contamination) and should be considered and interpreted within this context. The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

Your environmental report should not be used without reference to Land & Water Consulting in the first instance:

- When the nature of the proposed development is changed, for example if a residential development is proposed instead of a commercial one;
- When the size or configuration of the proposed development is altered;
- When the location or orientation of the proposed structures are modified;
- When there is a change in ownership;
- For application to an adjacent site.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

ENVIRONMENTAL ASSESSMENT "FINDINGS" ARE PROFESSIONAL ESTIMATES

The information in this report is considered to be accurate with respect to conditions encountered at the site at the time of investigation and considering the inherent limitations associated with extrapolating information from a sample set. Note however that site assessment identifies actual subsurface conditions only at those specific points where samples are taken, when they are taken. Environmental data derived through sampling and analysis are interpreted by consultants who then render an opinion about overall subsurface conditions, the nature and extent of contamination and potential impacts on the use of the land. Actual conditions may differ from those inferred to exist as no professional and no subsurface assessment program can reveal every detail within the ground across a site. Subsurface conditions can vary across a particular site and no practical degree of sampling can ever eliminate the possibility that conditions may be present at a site that have not been represented though sampling.

SUBSURFACE CONDITIONS CAN CHANGE

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Land & Water Consulting should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions. Since subsurface conditions (including contamination concentrations) can change within a limited period of time and space, this inherent limitation to the representation of site conditions provided by this report should always be taken into consideration particularly if the report is used after a delay in time.

DATA SHOULD NOT BE SEPARATED FROM THE REPORT

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

RESPONSIBILITY

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.