VICTORIAN PLANNING AUTHORITY

OFFICER SOUTH EMPLOYMENT PRECINCT

SODIC/DISPERSIVE SOIL AND ACID SULFATE SOIL INVESTIGATION

SEPTEMBER 2021





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Officer South Employment Precinct Sodic/Dispersive Soil and Acid Sulfate Soil Investigation

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EXECUTIVE SUMMARY

WSP Australia Pty Limited (WSP) was engaged by the Victorian Planning Authority (VPA) in April 2021 to undertake a sodic/dispersive soils and acid sulfate soils assessment to inform precinct planning being undertaken by VPA at the Officer South Employment Precinct, at Officer South, Victoria (precinct/site).

The objectives of the works were to investigate sodic/dispersive and acid sulfate soils within the Officer South Employment Precinct, map their position, identify their severity and the associated implications for planned future development, in order to assist and inform the VPA precinct structure planning for Officer South Employment Precinct.

The scope of works undertaken to achieve the assessment objectives comprised: a Site walkover and preparation of a Sampling Analysis and Quality Plan to identify any additional areas of concern; soil investigation works to assess for sodic/dispersive and acid sulfate soils from 45 soil boreholes; analysis and interpretation of soil testing (including this report); and, opportunistic installation of a preliminary groundwater monitoring network (three monitoring wells) to provide an indication of groundwater depth, pH and TDS (including provision of a factual summary of monitoring well installation, water levels and field water quality indicators).

The drilling of bores was conducted with a 4WD-vehicle mounted drill rig between 19 and 21 May 2021, and on 24 March 2021. Mechanical drilling was undertaken using push tube drilling techniques, and a combination of hand auger, push tube and solid flight augers (groundwater monitoring wells).

Seven (7) soil profiles were encountered during the assessment works. Predominantly the soil profile was topsoil overlying a silty horizon layer (sometimes) overlying a clay subsoil (varying colour) which overlaid a sand layer (sometimes, commencing from depths of between 1.5 and 2.8 m). While the soil profiles encountered did not match exactly mapped soil type extent, it was considered that broadly the soil mapping and field results were complementary.

SODIC/DISPERSIVE SOILS

Visual evidence of the presence of sodic/dispersive soils was observed throughout the precinct during the site walkover on 27 April 2021. This consisted of erosion, pitting, water pooling, dribble patterns, and cloudy water in some dams.

Laboratory testing for exchangeable sodium percentage indicated that sodicity varied particularly in the upper 0.5 metres of the soil profile, however samples from 1.0 m and deeper, consistently reported sodic soils ranging from "strongly sodic" to "very strongly sodic". Overall, variability was consistent across all profiles, with the ranges overlapping at all depths. Note that while sodic soils are generally dispersive, not all sodic soils disperse and not all dispersive soils are sodic.

Emerson tests show majority of soil samples have Emerson Class 2, which is to say the majority of samples show some dispersion of air dried crumbs (2) while some samples show dispersion only when remoulded (3). While the Emerson Class tests gives a guide to the potential for a soil to disperse, it should be noted that certain chemical characteristics, such as the presence of high soluble aluminium and salinity may result in a low Emerson Class Number, when in actual fact the soil may have a high tendency to dispersion.

The presence and severity of dispersive soils can vary over short distances and so the testing represents the information at the sampling location and depth only – care should be taken if inferring dispersive potential of soils in between sampling locations.

Based on the range of exchangeable sodium percentage (predominantly strongly to very strongly sodic) and dispersivity results (Emerson class predominantly 2) reported across the depth profile (up to 3.0 mBGL) and across the precinct, it should be assumed that all soils within the precinct are potentially dispersive and strongly (to very strongly) sodic, unless testing at a higher sampling density is undertaken to prove otherwise.

ACID SULFATE SOILS

Possible indicators of the presence of acid sulfate soils was observed throughout the precinct during the site walkover on 27 April 2021. This consisted of reeds (visible in select areas of the precinct, particularly along watercourses), possible iron-stained sand (observed in deep wheel ruts between Lecky Road and Cardinia Creek), and waterlogged soils and swampy areas (observed from Stephens Road and Officer South Road). No other potential indicators of acid sulfate soil occurrence were noted during the site inspection, (e.g. milky discharge, stressed vegetation, concrete corrosion, mid to dark grey to dark greenish-grey coloured soils or sediments, offensive odours).

No evidence of the presence of acid sulfate soils was observed in the subsurface during intrusive soil investigation works. Stained and/or odorous soils were not observed during sample collection. Neither marine nor swampy deposits were observed in the soil profiles encountered, and mottling was observed in all soil profiles (to the depth assessed), indicating that the soil profile has been exposed to periodic oxidising conditions.

The results of the initial screening analysis suggested actual acid sulfate soil may be present (3 samples) and a majority of samples reported a reaction to peroxide oxidation indicative that potential acid sulfate soil may be present (61 samples).

A total of 22 selected soil samples from 6 soil bore locations (see Figure 3, Appendix A) representing the most likely locations where AASS/PASS may be present were further analysed for chromium reducible sulfur.

The chromium reducible sulfur content of the soil (representing the risk of additional acidification potential as a result of sulfide oxidation) was low, in all cases below the action criteria (0.03 %S). The net acidity was less than the action criteria in 10 of the 22 tests. Where the threshold was met or exceeded this was largely due to the total actual acidity concentration rather than through oxidation of sulfides. This result indicates that the soil is naturally acidic, and has limited acid generating potential. The elevated reaction rates are likely attributable to the presence of organic material in soil samples, as well as small amounts of chromium reducible sulfur present in soil samples (below action levels).

While some boggy ground and traces of sulphides were identified, the shallow water table was generally >3.0m below the surface, indicating that oxidation has likely already occurred in the soil profile (to 3.0mBGL) during dry periods (further corroborated by mottled colour of the soil profiles).

Given that pH at the Site remains predominantly above the action criteria (p $H_{\rm field}$), this supports that the reported trace sulfide content is not sufficient to greatly further affect soil acidity. As the assessment did not report evidence that acid sulfate soils were present (in assessed areas to the maximum depth of assessment, 3 mbgs), it is considered that the likelihood of encountering acid sulfate soils at the precinct is low.

VULNERABILITY ASSESSMENT

The precinct presented a **low risk of vulnerability to the presence and associated impact of acid sulfate soils**. Acidity observed in soils was considered likely to be driven by a weak, less corrosive organic acid or very low traces of as-yet unoxidized sulphides within the vadose zone. Consideration may need to be made in relation to selection of building materials and sensitive plant species in the context of naturally acidic soils.

The precinct is vulnerable to soil dispersion, which can lead to the development of tunnel and surface erosion resulting in an increased risk of damage to buildings and service infrastructure as a result of the undermining of foundations and/or slumping and collapse of ground into voids and cavities that have been formed (see Figure 5 and Figure 6, Appendix A). Dispersion can also create environmental hazards such as reduced water quality.

Precinct planning should incorporate management and mitigation measures to reduce the risks to the Officer South Employment precinct (during and after development) from dispersion. Management and mitigation measures can include treatment of soils, assessment, excavation management, design controls and non-structural control measures.

RECOMMENDATIONS FOR FURTHER ASSESSMENT

WSP has undertaken an assessment to support VPA's Strategic Planning for the Office South Precinct. With reference to acid sulfate soils, sodic and dispersive soils, it was considered that the assessment undertaken was sufficient to support Strategic Planning Requirements. Further, the assessment is considered sufficient to assist the Statutory Planning

Authority's (Council) decision making with regards to future Statutory Planning approvals, including the development of Planning Permit conditions to manage risk associated with acid sulfate soils, sodic and dispersive soils. Further assessment by a project proponent may be warranted in relation to management of site/development specific risk.

1 PURPOSE AND OBJECTIVES

WSP Australia Pty Limited (WSP) was engaged by the Victorian Planning Authority (VPA) in April 2021 to undertake a sodic/dispersive soils and acid sulfate soils assessment at the Officer South Employment Precinct, at Officer South, Victoria (precinct/site).

A precinct figure is provided as Figure 1, Appendix A

1.1 PURPOSE

The purpose of the works was to assist VPA in understanding the presence and extent of sodic/dispersive and acid sulfate soils within the precinct to inform the precinct structure planning being undertaken and provide **options for their** management in a property development context.

1.2 OBJECTIVES

The objectives of the works were to:

- Investigate sodic/dispersive and acid sulfate soils within the Officer South Employment Precinct, map their position, identify their severity and the associated implications for planned future development.
- Assist and inform the VPA precinct structure planning for Officer South Employment Precinct.

BACKGROUND 2

2.1 LITERATURE REVIEW

Information included in the literature review (Table 2.1 below) is based on information sourced from both VPA and key stakeholders (refer to Section 2.2).

The precinct plan is presented in Figure 1, Appendix A.

Findings of the previous assessments detailed below have been represented in Figure 2 (soil types and risk of dispersion) and Figure 2 (acid sulfate soil risk), Appendix A.

Table 2.1 Literature Review

SITE AREA	Site Area: 1,069 ha
SITE LAYOUT	The precinct is bounded by Cardinia Creek to the west, Princes Freeway to the north, Lower Gum Scrub Creek to the east, and the urban growth boundary to the south (in part formed by Patterson Road).
CURRENT SITE USE	Predominantly agricultural land, with some residential properties. A BP service station (Officer Inbound) is present in the north of the site adjacent south of the Princes Freeway.
SITE HISTORY	Historical summary (Aurecon, 2020): The precinct has been largely used for agricultural purposes until present day. A racetrack and associated sheds / buildings were constructed in the north-east of the precinct between 1974 and 1985. A gas pipeline easement was added in an east-west direction between 1991 and 2004. The Princes Freeway adjacent to the northern boundary of the precinct was constructed in the late 2000's. The service station in the north of the precinct was constructed in 2013.
ENVIRONMENTAL REGULATORY LISTINGS	Not listed as holding any operational licences issued by EPA Victoria, subject to notices, or listed as a notified or regulated contaminated site.
POTENTIAL FOR ENVIRONMENTAL ISSUES	Potential for issues: Potential for erosion along Cardinia Creek due to presence of sodosols, which are expected to exhibit dispersive properties. Acid sulfate soils (ASS) potentially present at site, particularly along Cardinia Creek, and an area in the south of site. Potential for contamination associated with the service station in the north of the precinct. However, it was reported by Aurecon (2020) that given this service station is less than ten years old, it is likely that it was constructed to meet modern environmental and engineering standards, with adequate monitoring in place.
	A review of the Atlas of Australian Acid Sulfate Soils (Australian Soil Resource Information System, 2013) shows that there is a low probability (very low confidence) to extremely low probability (very low confidence) for the occurrence of ASS to occur across the precinct, with the exception of two localised areas in the north-west of the precinct (waterbodies along Cardinia Creek) where there is a high probability (very low confidence) for the occurrence of ASS.
	Macmillan, M.J. (1997) undertook a land capability study of the Cardinia Shire, and concluded that the Officer South Precinct had a low to very low susceptibility and incidence of water and wind erosion, moderate susceptibility of salting and acidification, and moderate to low incidence of salting.
	The Department of Natural Resources and Environment (2002) performed a salinity risk assessment in the Cardinia area. It showed that the northern area of the precinct was

mapped as having a depth to water table of 0-2 m, and 2-5 m in the southern area, and high risk of salinity due to low permeability and shallow groundwater. **Visual observations:** Aurecon (2020) observed visual indicators of dispersive soils throughout the precinct. These included: soil prone to becoming water-logged and boggy, slow water infiltration, and erosion of the banks along Cardinia Creek (evident from deep channels, undercutting of profile, and cracks forming in dry areas). Aurecon (2020) also noted that a review of available aerial imagery indicated the presence of marshes or wetlands, which are reportedly a strong indicator of ASS. Areas of the precinct inspected contained reed growth and localized areas of pooled or stagnant water, and organic odours were noted in the southern area of Cardinia Creek. UNDERGROUND The precinct has various underground services and utilities existing, including: **SERVICES** stormwater drainage (swale drains and connecting pipes), potable water (along Officer South Road), sewer (along the northern boundary of the precinct, including a pump station in the north of the precinct, west of Officer South Road), telecommunications (including a major Telstra fibre optic cable along Lecky Road between Officer South Road and Soldiers Road), high pressure gas pipelines (along Lecky Road and adjacent to Officer South Road in private property), and the T1 Morwell-Dandenong 450 mm high pressure gas pipeline (running west-east through the precinct within a 20.1 m wide easement. Additionally, there are three overhead transmission lines running east-west in the south of the precinct within a 146.30 m wide easement. **ENVIRONMENTAL** The following overlays apply to parts of the precinct: **PLANNING Development Contributions Plan Environmental Significance** Floodway Heritage Incorporated Plan – Schedule 2 Infrastructure Contributions Land Subject to Inundation **Public Acquisition** Special Controls It is noted that should the service station be redeveloped into a more sensitive use (i.e. residential), it is likely that an environmental audit would be required. RECOMMENDATIONS Further investigation into dispersive soils and ASS should be performed via intrusive sampling using test pits or boreholes. Soils should be laboratory tested for: Dispersive soil behaviour (Exchangeable Sodium Percentage, Emerson Crumb) Acid sulfate soils (field testing, SPOCAS, Chromium Suite) Salinity (EC) Investigations should be conducted as development progresses. However, acid sulfate soil testing should be performed in medium and high-risk areas (i.e. along Cardinia Creek and in the south of the site). **ADDITIONAL** Atlas of Australian Acid Sulfate Soils, Australian Soil Resource Information System, last REFERENCES updated April 18, 2013 – accessed online: https://www.asris.csiro.au/themes/AcidSulfateSoils.html

2.2 STAKEHOLDER INPUT

Contact was made with key stakeholders by WSP in the week starting 26 April 2021. This comprised notification of the planned assessment works and providing stakeholders an opportunity to provide comments/input. Details of feedback received from each stakeholder is provided below.

APA Group

WSP was advised by Peter Dawson of APA Group that there were no new pipelines proposed for the precinct that he was aware of. APA Group's main concern was regarding the existing pipeline and associated easement and ensuring that WSP's proposed drilling works would not encroach the easement.

AusNet

Did not provide any feedback.

Cardinia Shire Council

Cardinia Shire Council provided WSP with the following documents for review:

- Cardinia Shire Council (September 2015) Integrated Water Management Plan 2015-25
- Macmillan, M.J. et al (February 1997) A Land Capability Study of the Cardinia Shire Technical Report No. 29
- The State of Victoria, Department of Natural Resources and Environment (September 2002) Identification and assessment of salinity risk in the growth corridor area of Cardinia Shire
- SKM (June 2005) Melbourne 2030: Casey-Cardinia Growth Area Shallow Watertable Constraints on Urban Development

Major Road Projects Victoria

Major Road Projects Victoria indicated that the information gathered would be useful, and they would be interested in receiving the results. They had no comments on the program.

It is understood that planning has been undertaken to extend Thompsons Road from Clyde North east through the precinct.

Melbourne Water

Melbourne Water plans were provided by VPA and show that drainage pipelines are proposed in various areas across the precinct. A linear waterway/wetland system is proposed to run along Officer South Road adjacent east. Soil boreholes along this road alignment were situated approximately 30 m from the centreline of the road where possible to target this proposed infrastructure.

Feedback received from Melbourne Water included suggestions to position two soil borehole locations to target proposed assets:

- A soil bore at the southern end of Officer South Road was positioned to the west of the road to target a proposed future asset; and
- A soil bore to the north of Lecky Road along Gum Scrub Creek was positioned on the eastern side of the creek to target a proposed alternate location for the 'Lecky Road Retarding Basin'.

Melbourne Water also indicated that they were interested in obtaining more information regarding groundwater levels and salinity within the precinct. As such, three groundwater monitoring wells were advanced by WSP along the Officer South Road alignment.

South East Water

South East Water provided plans showing proposed locations of water, recycled water and sewer assets within the precinct. They also indicated that where there are proposed pumping stations for the precinct, they were interested in positioning deeper soil boreholes. Plans provided show that there is a pumping station proposed for the south-eastern corner of the precinct.

2.3 SITE INSPECTION OBSERVATIONS

A site inspection was completed by WSP on 27 April 2021 prior to intrusive soil sampling works. Site observations were mainly focussed on evidence of sodic/dispersive soils and acid sulfate soils. Although the site inspection was limited to areas of public access, the following observations were made (refer also to the attached photologs in Appendix B):

- A large fill embankment was present at the northern end of Officer South Rd, likely due to freeway works, or construction of the service station.
- The precinct was relatively flat, with short grasses, and livestock.
- No large unvegetated areas were observed (e.g. cropping or vegetation removal).
- Significant water pooling was present across the site, both on gravel roads and on farm lots. It is noted that the
 walkover occurred after a rain event. This resulted in boggy conditions when traversing the site.
- Various farm dams were located in many of the lots.
- The southern boundary was lined with small to large trees, fencing, and bound by a gravel unsealed road.
- The western boundary was bound by Cardinia Creek, with very high vegetation, fallen trees, large trees, hilly
 conditions and was very difficult to access by foot during the site walkover.
- The eastern boundary was bound by various housing estates, and low grasses.
- The northern boundary was bound by the Princes Freeway, with a service station and three dams present between the Princes Freeway and Handford Lane.
- The dirt track on the west side of Lecky Road was undriveable during the inspection, with high surface water, boggy conditions, and overgrown vegetation.

2.3.1 SODIC/DISPERSIVE SOILS

A site walkover was undertaken on 27 April 2021 by a Geotechnical Engineer to identify features of Sodic Soils. The following features were observed:

- Evidence of erosion was present on the banks on tributaries of the Cardinia Creek, off the west side of Officer South Road;
- Some potential pitting of soil was noted above a service on Patterson road;
- Basalt beaching was observed on a drain on Officer South Road, likely to reduce erosion;
- Across the site, water pooling was significant in many of the lots;
- Dribble pattern was seen above a telecom service on Handford Lane (refer Photo 2.1 below);
- Waters in two of the three northern dams off Handford Lane (within the service station) were noted to be very cloudy;
- Although difficult to access, viewpoints of Cardinia Creek showed dribble patterns on soil around the area (refer Photo 2.2 below);

 Dams in the west of the precinct, just outside the boundary, were observed to be relatively clear, and without sediment.



Photo 2.1 Dribble pattern above telecom service on Handford Lane



Photo 2.2 Dribble pattern on soil near Cardinia Creek

2.3.2 ACID SULFATE SOILS

- Reeds were visible in select areas of the precinct, particularly along watercourses.
- Possible iron-stained sand was observed in deep wheel ruts between Lecky Road and Cardinia Creek.
- Waterlogged soils and swampy areas were observed from Stephens Road and Officer South Road.
- No other potential indicators of acid sulfate soil occurrence were noted during the site inspection, (e.g. milky discharge, stressed vegetation, concrete corrosion, mid to dark grey to dark greenish-grey coloured soils or sediments, offensive odours).

3 SCOPE OF WORKS

3.1 GENERAL SCOPE OF WORKS

The scope proposed to achieve the assessment objectives identified in Section 1.2 the following was undertaken:

- 1 Preparation of a Sampling Analysis and Quality Plan to identify any additional areas of concern.
- 2 Soil investigation works to assess for sodic/dispersive and acid sulfate soils from 45 soil boreholes.
- 3 Analysis and interpretation of soil testing and provision of a report detailing the findings.
- 4 Opportunistic installation of a preliminary groundwater monitoring network* (three monitoring wells) to investigate groundwater depth, pH and TDS.
- 5 Preparation of a factual summary of monitoring well installation, water levels and EC/pH (field indication), and borelogs including GPS coordinates.
- *: The groundwater assessment was intended to provide limited/indicative inference regarding specified parameters and was in no way intended to represent a detailed assessment of groundwater conditions within the precinct.

The scope of works is detailed further in the following sections.

3.2 SOIL ASSESSMENT

To assess for the presence of sodic/dispersive and acid sulfate soils across the precinct, the following works were:

Drilling of 45 soil bores in an approximate grid pattern to a maximum depth of 3.0 m. The depth of soil bores (either 2.0 m or 3.0 m) is indicated on Figure 1, Appendix A.

Positioning of bores and their target depths was based on proposed locations and depths of planned drainage and sewer infrastructure (stakeholders), as well as areas of concern (literature review, site inspection). Deeper bores were positioned along the creeks, proposed wetlands along Officer South Road, sewer pumping station, and other areas of proposed underground drainage pipelines. A selection of boreholes targeted the following areas within the precinct (where practicable):

- Areas with potential for medium-high risk of acid sulfate soil occurrence (i.e. along Cardinia Creek and an area in the south of the precinct);
- areas with potential for medium-high risk of dispersive soils;
- land immediately east (and within 50 m) of Officer South Road, where there is a linear waterway/wetland system proposed. Bores were positioned approximately 30 m from the road; and
- areas where waterlogged soils were observed during the site inspection.

The soil sampling locations are shown on Figure 1, Appendix A.

Soil samples were submitted to NATA accredited laboratories for analysis. The number of soil samples submitted, and specific laboratory analysis are summarised in the Table 3.1.

Table 3.1 Laboratory Analysis

MATRIX	PRIMARY	DUPLICATES/ TRIPLICATES	ANALYSIS
Soil	53	4	Emerson Class Dispersion Testing
	53	4	Exchangeable Sodium Percentage (ESP)
	98	6	pH - Field (pH _{field})
	98	6	pH – Field Oxidised (pH _{fox})
	22	2	Chromium Reducible Sulfur (CRS) Suite
	1	0	Suspension Peroxide Oxidation Combined Acidity (SPOCAS) Suite

3.3 GROUNDWATER ASSESSMENT

- Installation of three groundwater monitoring bores was performed in a N-S direction along Officer South Road (licenced, with flush mount gatic covers and star picket markers) to target a proposed Melbourne Water drainage system.
- Development of wells on the day of installation (where water was present).
- Pole-mounted dGPS (+/- 25mm position accuracy) coordinates for each groundwater well.
- Measurement of groundwater level and collection of field water quality parameters after installation.

It is noted that levels and water quality parameters were collected on the day of installation (where water was present) and/or after three or four days as an indicative assessment of water levels. It is considered that more reliable results would involve subsequent sampling and/or purging once monitoring wells have acclimated to the aquifer.

4 METHODOLOGY

4.1 FIELDWORK

4.1.1 SOIL INVESTIGATION

The general soil sampling methodology for sodic/dispersive and acid sulfate soil sampling is summarised in Table 4.2.

Table 4.1 Soil investigation methodology

ITEM	DESCRIPTION
Service location	Soil borehole locations were cleared prior to commencement by an appropriately qualified service locater, particularly boreholes along (or in close proximity to) road reserves. A WSP ground penetration permit was prepared for the site.
Drilling of boreholes	The drilling of bores was conducted with a 4wd mounted drill rig between 19 and 21 May 2021, and on 24 March 2021. Mechanical drilling was undertaken using push tube drilling techniques, and a combination of hand auger, push tube and solid flight augers (groundwater monitoring wells).
Logging	Stratigraphy and other relevant information observed during drilling (e.g. in situ testing, and any groundwater inflow or levels) was recorded by appropriately qualified personnel. Logging of soils was undertaken in accordance with AS1726-1993 Geotechnical Site Investigations and the Unified Soil Classification System (USCS). Borehole logs are presented in Appendix C.
Soil sampling	Up to five soil samples per soil bore were analysed. Soil samples were collected at the following depth intervals; — 0.1 mBGL — 0.5 mBGL
	— 1.0 mBGL and every 1.0 m interval thereafter to the maximum depth of 2.0 or 3.0 m
	Samples were kept in laboratory supplied jars and resealable bags and kept in ice cooled esky while on-site and when in transit to the laboratory.
	Further, 104 samples were subject to a field acid sulfate soil test as per EPA Victoria (2009) Publication 655.1 – Acid Sulfate Soil and Rock.
Quality control	Duplicate samples were collected in the field at the rate of 1 in 20 primary samples for possible analysis by the primary laboratories.
Laboratory analysis	Australian Laboratory Services (ALS) Group is the nominated primary laboratory, and Eurofins Pty Ltd and Ground Science Pty Ltd are the nominated secondary laboratories respectively. All laboratories are accredited by the National Associated of Testing Authorities (NATA).

4.1.2 GROUNDWATER INVESTIGATION

A total of three groundwater monitoring wells (MW01 to MW03) were installed during the fieldworks outlined in Section 4.1.1 by conversion of soil bores using solid flight auger to the target depth.

All groundwater monitoring wells were constructed with 50 mm, class 18 threaded, flush-jointed polyvinyl chloride (PVC) screen and casing. No organic solvents or glues were used during construction or installation of the monitoring wells.

A filter pack comprising clean graded sands and/or gravels of suitable size (1–2 mm average grain size, silica material) to provide sufficient inflow of groundwater was installed within the annular space between the bore and the well casing. The filter pack extended from the base of the screened interval to 1.0 m above the termination of the slotted casing.

In order to minimise the likelihood of surface water or perched groundwater infiltrating the aquifer, a bentonite plug, comprising pelleted or granulated bentonite, was placed above the filter pack to a thickness of 1.0 m. Concrete was used to complete the well to the ground surface and installed as a groundwater well with a gatic cover and star picket to mark the location

Groundwater monitoring wells containing water were developed following installation to remove fines from the well and to allow the flow of a representative groundwater into the well for subsequent sampling.

Development was undertaken using a bailer. This was done by purging a minimum of three well volumes and/or until the well was purged dry.

Monitoring wells were surveyed to Australian Height Datum (AHD) and Map Grid of Australia (MGA) co-ordinates using a high-resolution GPS.

Field parameters (pH, dissolved oxygen, conductivity, redox potential and temperature) were recorded during the sampling event using a water quality meter, calibrated prior to use. The groundwater was visually assessed for turbidity and evidence of contamination such as odour or unusual discoloration.

Groundwater well construction details are presented in Table 5.2.

Table 4.2 Groundwater monitoring well construction details

WELL ID	INSTALLATION DATE	EASTING	NORTHING	TOTAL DEPTH (MBTOC)	TOP OF CASING (MAHD)	SCREEN INTERVAL (MBTOC)
MW01 (BH17)	21/05/2021	360157.55	5874086.09	5.10	29.545	2.10 - 5.10
MW02 (BH19)	20/05/2021	359971.20	5782936.88	5.10	26.290	2.10 – 5.10
MW03 (BH21)	20/05/2021	359768.0*	5781837.3*	7.10	22.8*	4.10 – 7.10

Position details collected using WSP's RTK dGPS (accuracy +/- 25mm), MGA Zone 55, AHD.

4.2 ASSESSMENT CRITERIA

4.2.1 SODIC/DISPERSIVE SOILS

Sodic soils are clay soils which contain exchangeable sodium between the clay platelets. When a sodic soil comes into contact with non-saline water or rainwater, water molecules are drawn in-between the clay platelets resulting in swelling of the clay and, often, the detachment of clay platelets into the water making the water cloudy in a process called dispersion. Dispersion can lead to the development of tunnel and surface erosion resulting in an increased risk of damage to buildings and service infrastructure as a result of the undermining of foundations and/or slumping and collapse of ground into voids and cavities that have been formed. Dispersion can also create environmental hazards such as reduced water quality.

The sodium content in a soil (sodicity) is commonly categorised on the basis of Exchangeable Sodium Percentage (ESP) after Rengasamy and Churchman, 1999 and Northcote and Skene,1972.

^{&#}x27;*' Position details inferred across from accurate reading 5m to the west - interference due to trees

Table 4.3 Soil sodicity based on exchangeable sodium percentage

DESCRIPTION	EXCHANGEABLE SODIUM PERCENTAGE (ESP)
Non-sodic or low-sodic	< 6%
Sodic	6 -15%
Strongly sodic	15-25%
Very strongly sodic	>25%

Note that while sodic soils are generally dispersive, not all sodic soils disperse and not all dispersive soils are sodic. Evidence of historical dispersion at a site may be identified in the field while dispersion potential can be assessed using field and/or laboratory testing.

A common laboratory test to predict dispersive behaviour in soils is the Emerson soil crumb test (AS 1289.3.8.1-2017). Soils are divided into 7 classes (with an additional class for soil containing calcium rich minerals) based on their coherence in water. The test was developed by Emerson in 1967, and updated in 2002 (Emerson, 2002).

Figure 4.1 below shows the Emerson classes. Emerson Class 1 and 2 are considered susceptible to tunnel erosion (DPIPWE, 2009).

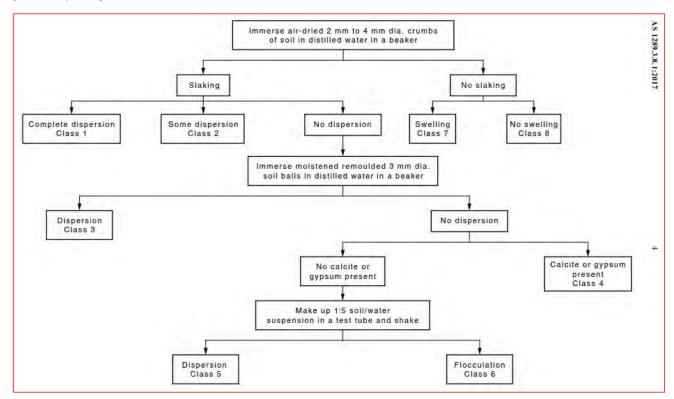


Figure 4.1 Emerson soil classes (extract from AS1289.3.8.9:2017)

4.2.2 ACID SULFATE SOILS

Field pH (pH_F) and field pH peroxide (pH_{FOX}) tests have been developed to enable rapid assessment of the likelihood of acid sulfate soils and in general accordance with EPA Victoria Acid Sulfate Soil and Rock Publication 655.1 (EPA Vic 2009), as detailed below:

- pH_F measure of soil pH of a soil water paste
- pH_{FOX} measure of soil pH after rapid oxidation with hydrogen peroxide (H2O2)

- Effervescence of reaction rate – a visual measure of the vigorousness of the oxidation reaction rate where: 1 = slight; 2 = moderate; 3 = high and 4 = extreme.

Interpretation of the results and action criteria required are summarised in Table 4.4.

Table 4.4 Interpretation of field pH results

pH _F	pH _{FOX}	ΔрΗ	REACTION RATE	ACTION REQUIRED
≥ 5.0	≥ 5.0	≤ 2.0	1-2	If no other field indicators or ASS risk indicators are present, no further action required
> 4.0 and < 5.0	> 3.0 and < 5.0	> 2.0	≥ 2	PASS may be present, further assessment is required
≤ 4.0	≤ 3.0	> 2.0	≥ 2	AASS or PASS are likely to be present, further assessment is required

Also in accordance with Acid Sulfate Soil and Rock 655.1 (EPA Vic 2009) the assessment criteria adopted for ASS are the Texture-Based ASS Action Criteria based on net acidity. The assessment criteria are provided in Table 4.5. It is noted that the action criteria themselves are not designed to identify acid sulfate as such, triggering the action criteria requires preparation of an acid sulfate soil management plan that should consider the risk and management approach.

Table 4.5 Texture-based ASS Action Criteria

TYPE OF MATERIAL		NET ACIDITY CF	RITERIA (1-1,000 nes)	NET ACIDITY CRITERIA (>1,000 tonnes)	
Soil Texture	Approx. Clay Content	(%S) (oven-dry basis)	(mol H+/tonne) (oven dry basis)	(%S) (oven-dry basis)	(mol H+/tonne) (oven dry basis)
Sands to loamy sands	<5%	0.03	18	0.03	18
Sandy loams to light clays	5-40%	0.06	36	0.03	18
Medium to heavy clays and silty clays	>40%	0.1	62	0.03	18

Note: values highlighted and in **bold** are the criteria applied for the project area (refer to below discussions).

Given this assessment is to inform Precinct Planning, and given the size of the precinct (>1,000 Ha), the total volume of soil to be excavated/disturbed remains unknown and is assumed to exceed 1,000 tonnes.

Based on a review of the borehole logs, samples submitted for CRS analysis ranged from silt to clay with occasional sands, therefore soil was assumed to be sandy loams to light clays.

Criteria adopted for ASS assessment is highlighted in Table 4.5, i.e. 0.03%S and 18 mol H+/tonne for net acidity.

5 RESULTS AND DISCUSSION

5.1 SUBSURFACE CONDITIONS

Intrusive soil sampling was carried out between 19 and 21 May 2021, and on 24 March 2021 (refer Section 4.1.1). A total of 45 boreholes were advanced across the precinct. Detailed logs of soil boreholes were recorded and are presented in Appendix C.

Seven (7) soil profiles were encountered during the assessment works. These are spatially presented in Figure 4 in Appendix A, and visually presented as generalised profile logs incorporating field observations and laboratory results, presented in Appendix B.

A summary of the soil profiles encountered is presented in Table 5.1 below.

Table 5.1 Soil profiles encountered in the Officer South Employment Precinct

PROFILE CODE	COLOUR OF CLAY	SAND LAYER AT DEPTH	SILT BELOW TOPSOIL	LOCATIONS MAPPED TO SOIL PROFILE (N=45)
B-cl-n	Brown (with mottles)	No	No	BH02, BH03, BH07, BH22, BH31, BH36, BH45 (n=8)
B-cl-y			Yes	BH15, BH24, BH26 (n=3)
B-sd-n		Yes	No	BH01, BH11, BH29, BH41 (n=4)
G-cl-n	Grey (with mottles)	No	No	BH04, BH05, BH06, BH08, BH12, BH13, BH16, BH17, BH21, BH23, BH28, BH35, BH37, BH38, BH39, BH42, BH43, BH44 (n=18)
G-cl-y			Yes	BH09, BH10, BH14, BH18, BH19, BH20, BH30, BH32 (n=8)
G-sd-n		Yes	No	BH25, BH27, BH40 (n=3)
G-sd-y			Yes	BH33, BH34 (n=2)

The following field observations were made during soil sampling:

- The soil bores were predominantly located within grassed areas, mostly within paddocks, but also within road reserves and among agricultural infrastructure.
- Predominantly the soil profile was topsoil overlying a silty horizon layer (sometimes) overlying a clay subsoil
 (varying colour) which overlaid a sand layer (sometimes, commencing from depths of between 1.5 and 2.8 m). The
 extent of the silty horizon and underlying sand is indicated on Figure 4, Appendix A
- Topsoil thickness varied across the precinct and was up to 0.9 m thick at borehole BH09.
- Fill soil was only encountered at the following boreholes:
 - BH04: advanced within the Handford Lane road reserve;
 - BH12: anecdotal evidence indicated that sandy fill had been imported to site for a horse training track; and
 - BH38: advanced in the vicinity of road and drainage infrastructure under development at the Officer South Road
 Princes Freeway interchange.

- Clay was observed to be brown or grey, with orange mottling throughout.
- Orange-red clays were encountered at borehole BH15 from a depth of 1.5 m.
- No odours or other visual indicators for the presence of acid sulfate soils were observed during sample collection.

Figure 2 and Figure 3, Appendix A, show the mapped soil types and acid sulfate soil risk in the precinct, predominantly brown sodosols, but also grey kurosols and grey dermosols. The soil profiles encountered did not match exactly mapped locations, however it was considered that broadly the soil mapping and field results were complementary.

5.2 SODIC/DISPERSIVE SOILS

5.2.1 FIELD OBSERVATIONS

As noted in Section 2.3.1, evidence of the presence of sodic/dispersive soils was observed throughout the precinct by a Geotechnical Engineer during the site walkover on 27 April 2021. This consisted of erosion, pitting, water pooling, dribble patterns, and cloudy water in some dams.

Intrusive soil investigation works showed that beneath topsoil in the precinct, the soil was predominantly clay, with a silty horizon present beneath the topsoil in select locations, and sand at selected locations from 1.5 m depth onwards.

The soil profiles were separated by colour and the presence/absence of silt and sand (see 5.1 above), and the potential for dispersivity and sodicity were investigated further by laboratory analysis.

5.2.2 LABORATORY ANALYTICAL RESULTS

Samples were taken from soil bore location as shown in Figure 1 Appendix A, from a range of depths from 0.1 - 3.0, and selected samples were submitted for laboratory testing for ESP and Emerson Class testing.

Laboratory analytical results are provided in Table 1 Appendix D. Copies of laboratory certificates of analysis and chain of custody documentation are provided in Appendix E.

Table 5.2 below summarises samples submitted and results of Emerson Class and exchangeable sodium percentage analysis.

Table 5.2 Summary of sample results – Emerson Class and Exchangeable Sodium Percentage

SAMPLE DEPTH (MBGL)	EXCHANGEABLE SODIUM	EMERSON CLASS
0.1 (n=5)	3.7 – 23.8	2 (n=5)
0.5 (n=14)	4.6 – 25.5	2 (n=12), 3 (n=2)
1.0 (n=16)	13.5 – 30.0	2 (n=16)
2.0 (n=14)	13.3 – 33.3	2 (n=12), 3 (n=2)
3.0 (n=4)	16.1 – 31.2	2 (n=4)

The laboratory testing shows sodic to very strongly sodic soils are present across the precinct, with exchangeable sodium percentage ranging from 3.7% - 33.3%. A plot of exchangeable sodium percentage against sample depth is provided in Figure 5.1 below.

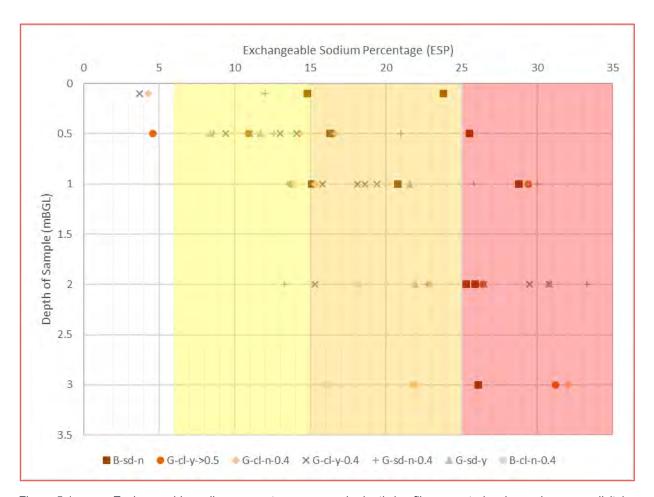


Figure 5.1 Exchangeable sodium percentage vs. sample depth (profile separated, colours show so sodicity)

It can be seen that sodicity varies particularly in the upper 0.5 metres of the soil profile, however from 1.0 m and deeper, sodicity is consistently "strongly sodic" to "very strongly sodic". Overall, variability was consistent across all profiles, with the ranges overlapping at all depths.

Note that while sodic soils are generally dispersive, not all sodic soils disperse and not all dispersive soils are sodic. Evidence of historical dispersion at a site may be identified in the field while dispersion potential can be assessed using field and/or laboratory testing. It is also important to understand that the risk of erosion relates to the soils dispersivity, and in addition landscape features such as the slope, catchment and vegetative cover.

Emerson tests show majority of soil samples have Emerson Class 2, which is to say the majority of samples show some dispersion of air dried crumbs (2) while some samples show dispersion only when remoulded (3).

While the Emerson Class tests gives a guide to the potential for a soil to disperse, it should be noted that certain chemical characteristics, such as the presence of high soluble aluminium and salinity may result in a low Emerson Class Number, when in actual fact the soil may have a high tendency to dispersion.

Figure 4 Appendix A shows the indicative soil profiles encountered across the precinct.

It should be noted that the presence and severity of dispersive soils can vary over short distances and so the testing represents the information at the sampling location and depth only – care should be taken when inferring dispersive potential of soils in between sampling locations.

It should be noted that no testing has been done below 3 metres. Additional testing may be required if excavation is proposed at a depth greater than 3.0 m.

Given the range or results found, it should be assumed that all soils within the precinct are potentially dispersive and strongly (to very strongly) sodic, unless testing at a higher sampling density is undertaken to prove otherwise.

Heat maps (Figure 5 and Figure 6, Appendix A) were prepared based on sodicity and dispersivity for shallow (up to 0.5 metres deep) and deeper (0.5-3 m) soils across the precinct using available laboratory data. The data was interpolated and averaged across the soil profiles where individual results were not available. Topography was not considered. The heat maps are presented as a precinct scale representation of erosion vulnerability based on the available data, and should be interpreted in consideration of the limitations of the investigation.

5.3 ACID SULFATE SOILS

5.3.1 FIELD OBSERVATIONS

As noted in Section 2.3.2, possible indicators of the presence of acid sulfate soils was observed throughout the precinct during the site walkover on 27 April 2021. This consisted of the following:

- Reeds were visible in select areas of the precinct, particularly along watercourses.
- Possible iron-stained sand was observed in deep wheel ruts between Lecky Road and Cardinia Creek.
- Waterlogged soils and swampy areas were observed from Stephens Road and Officer South Road.
- No other potential indicators of acid sulfate soil occurrence were noted during the site inspection, (e.g. milky discharge, stressed vegetation, concrete corrosion, mid to dark grey to dark greenish-grey coloured soils or sediments, offensive odours).

No evidence of the presence of acid sulfate soils was observed in the subsurface during intrusive soil investigation works. Stained and/or odorous soils were not observed during sample collection. Neither marine nor swampy deposits were observed in the soil profiles encountered (see Section 5.1 above).

Mottling was observed in all soil profiles (to the depth assessed), indicating that the soil profile has been exposed to periodic oxidising conditions.

5.3.2 FIELD PH (PH_F) AND FIELD PH PEROXIDE (PH_{FOX}) TESTS

Analysis of field pH (pH_F) and field pH after oxidation (pH_{FOX}) was carried out on 98 primary samples from 20 locations to provide an indication of the acid generating potential of the soils beneath the proposed project area. The sample locations were selected based on the soil profile encountered and across a vertical profile to ensure representative coverage across the precinct. The analysis results of pH_F and pH_{FOX} are presented in Table D1, Appendix D, and a summary is provided in Table 5.3 below.

Table 5.3 Summary of field pH peroxide testing results

SAMPLE DEPTH (MBGL)	pH _F (RANGE)	pH _{FOX} (RANGE)	ΔpH = pH _{FOX} -pH _F (RANGE)	REACTION RATE (RANGE)	INDICATIVE OF ACTUAL OR POTENTIAL ASS	CRS (%S) (RANGE)
0.1 (n=20)	5.1 – 7.3	2.3 – 5.5	1.6 – 4.4	1-4	Yes	< 0.005 - 0.021
0.5 (n=20)	5.2 – 8.1	3.3 – 5.3	1.4 – 3.5	1-4	Yes	< 0.005 - 0.014
1.0 (n=20)	5.2 – 7.9	2.8 – 6.2	0.9 – 2.7	1-3	Yes	< 0.005 - 0.011
2.0 (n=20)	4.9 – 7.8	3.6 – 6.6	0.6 – 2.1	1-3	Yes	0.006 - 0.014
3.0 (n=18)	4.7 – 8.0	3.4 – 8.0	0-2.2	1 – 4	Yes	0.008 - 0.016

Laboratory analysis certificates and chain of custody documentation are presented in Appendix E.

The results of the initial screening analysis are summarised as follows:

- 3 of the 98 primary samples have field pH results of <5 pH units, indicative that ASS may be present, and further assessment is required.
- 10 of the 98 primary samples reported a pH_{FOX} result below 3 pH units, a reaction to hydrogen peroxide indicative that PASS is likely to be present.
- 51 of the 98 primary samples reported a pH_{FOX} result between 3 and 5 pH units, a reaction to hydrogen peroxide, indicative that PASS may be present.
- 13 primary samples reported a change in pH (Δ pH) greater than 2 pH units indicative that PASS may be present.
- 42 of the 98 primary samples reported a reaction rate greater than 2 indicating PASS may be present. A review of the borehole logs indicated no evidence of shell fragments, and clay was mottled throughout the precinct, indicating oxidation had occurred.

5.3.3 CHROMIUM REDUCIBLE SULFUR

Due to the widespread slightly to moderately acidic pH readings across the project area, and the number of soil profiles (7) encountered across the precinct, 22 selected soil samples (plus 3 quality assurance samples) from 6 soil bore locations representing the most likely locations where AASS/PASS may be present were further analysed for CRS to confirm the presence of potential acidity based on their pH_F and pH_{FOX} results. The 6 locations are shown on Figure 3, Appendix A. The results of CRS analysis, summarised by soil texture and depth, are presented in Table 5.4 below, and within the laboratory analysis certificates and chain of custody documentation which are presented within Appendix E.

Table 5.4 Results of CRS analysis

LOCATION	DEPTH (m)	SOIL PROFILE AND TYPE	ACID GENERATING CAPACITY (%S)					
			TAA	CRS	NET ACIDITY	NET ACIDITY (ex ANC)	LIMING RATE (kg CaCO ₃ /T)	ACID GENERATING
BH03	0.1	Topsoil	0.02	0.010	0.04	0.04	2	No
(B-cl-n-0.4)	0.1*		0.03	0.017	0.04	0.04	2	No
BH11	0.1	Topsoil	0.05	0.011	0.06	0.06	3	No
(B-sd-n-0.4)	0.5	Brown clay	0.05	0.007	0.06	0.06	3	No
	1.0	Brown clay	0.07	0.011	0.08	0.08	4	No
	2.0	Brown clay	0.02	0.010	0.04	0.04	2	No
	3.0	Sandy silt	< 0.02	0.010	< 0.02	< 0.02	<1	No
BH28	0.1	Topsoil	0.02	0.021	0.04	0.04	2	No
(G-cl-n-<0.3)	0.5	Grey clay	0.02	< 0.005	0.02	0.02	1	No
	1.0	Grey clay	0.03	0.007	0.04	0.04	2	No
	2.0	Grey clay	0.03	0.008	0.03	0.03	2	No
	3.0	Grey clay	0.03	0.008	0.04	0.04	2	No
ВН33	0.1	Topsoil	< 0.02	0.008	< 0.02	< 0.02	<1	No
(G-sd-y-0.4)	0.5	Silt	< 0.02	0.014	0.02	0.02	1	No
	0.5**		< 0.02	-	< 0.02	< 0.02	<1	No
	1.0	Grey clay	< 0.02	0.009	<0.02	< 0.02	<1	No

LOCATION	DEPTH (m)	SOIL PROFILE AND TYPE	ACID GENERATING CAPACITY (%S)					
			TAA	CRS	NET ACIDITY	NET ACIDITY (ex ANC)	LIMING RATE (kg CaCO ₃ /T)	ACID GENERATING
	2.0	Grey clay	< 0.02	0.014	0.03	0.03	1	No
BH41	0.5	Brown clay	< 0.02	0.010	0.02	0.02	<1	No
(B-sd-n-0.4)	1.0	Brown clay	< 0.02	< 0.005	< 0.02	< 0.02	<1	No
	3.0	Sand	< 0.02	0.008	<0.02	< 0.02	<1	No
BH44	0.1	Topsoil	0.02	0.014	0.04	0.04	2	No
(G-cl-n-<0.3)	1.0	Grey clay	0.02	0.011	0.04	0.04	2	No
	2.0	Grey clay	0.02	0.006	0.03	0.03	1	No
	3.0	Grey clay	< 0.02	0.016	0.03	0.03	1	No

Notes: TAA – Titratable Actual Acidity; CRS – Chromium reducible sulfur; ANC – Acid Neutralising Capacity, * Blind Duplicate results, ** SPOCAS duplicate sample

The following points are noted regarding the CRS analysis:

- The chromium reducible sulfur content of the soil (representing the risk of additional acidification potential as a result of sulfide oxidation) was low, in all cases below the action criteria (0.03 %S).
- The soil sample selected for SPOCAS confirmation analysis showed good agreement with CRS suite results.
- The net acidity (which is the sum of the TAA and the CRS) was less than the action criteria in 10 of the 22 tests. Where the threshold was met or exceeded this was largely due to the TAA concentration rather than through oxidation of sulfides. This result indicates that the soil is naturally acidic, and has limited acid generating potential.¹
- The elevated reaction rates are likely attributable to the presence of organic material in soil samples, as well as small amounts of chromium reducible sulfur present in soil samples (below action levels).
- The results are corroborated by the field observations which showed the water table was generally not present to the depth of sampling (though some wet soil was encountered, standing water levels were observed at 3.3 metres below ground level see Section 5.5 below) and the soils were observed to be mottled in colour, which indicates an oxidised soil not consistent with PASS.

While the acidity appears be naturally present, we do note that a trace of sulfide acidity was detected, indicating that sulphides are present in trace quantities in the soil. The geological formation of the sediments has been interpreted as alluvial (i.e. not marine) which decreases the likelihood of ASS formation, however it is noted that the foothills to the north (up-gradient) are of marine origin (Silurian age micaceous quartz siltstone), and therefore it is possible that minor sulfide inclusions are sourced from erosion of this geological formation. Drainage of the Koo-Wee-Rup swamp (circa 1890's) may have influenced soil conditions at the precinct.

5.4 QUALITY ASSURANCE AND QUALITY CONTROL TESTING

A summary of the quality assurance and quality control (QA/QC) protocols followed for the collection and analysis of soil and groundwater samples be obtained as part of the assessment program are presented in Table 5.5 below. A review of QA methods and QC data was undertaken and indicated appropriate data reliability for the purpose of this assessment.

Table 5.5 Summary of QA/QC Protocols

ITEM	DESCRIPTION	COMMENT
General	Work will be undertaken following WSP's standard field procedures, which are based on industry accepted standard practice.	-
Calibration	All measurement equipment will be serviced and calibrated as per the manufacturer requirements and calibration certificates retained.	Calibration record for water quality meter is provided in Appendix F.
Equipment decontamination	Sampling equipment will be decontaminated after the collection of each soil sample by washing with Decon 90® detergent followed by water-only decontamination.	Cross-contamination risk was considered to be low based on soil sampling technique and analytes (non-contamination related). Given that the assessment did not consider analytes indicative of contamination, the analysis of rinsate blanks and trip blanks as indicators of cross contamination was not
		considered warranted.
Sample handling	All soil samples will be stored in chilled eskies after collection and during transport by courier to the laboratory. Prior to delivery to the laboratory, a chain of custody form (COC) will be completed. The COC will be signed and accompany the samples. Upon receipt by the laboratory, COC and/or samples receipt notices will be returned to confirm the receipt, condition of samples and specified analysis	Samples were stored on ice in cooled esky and sent to the laboratory daily.
Transport	Samples will be stored in a cooled esky and transported to the laboratory. To ensure the integrity of the samples from collection to receipt by the analytical laboratory, soil samples will be sent by courier to the laboratories under 'chain of custody', describing sample preservation, and transport duration.	
QC samples	Field QC samples will be analysed as follows: — intra-laboratory duplicate samples at a rate of 1 in 20 primary samples — inter-laboratory duplicate samples at a rate of 1 in 20 primary samples. Laboratory QC sample analysis primarily included duplicate analysis and method blanks. No surrogate spike recovery analysis was required due to absence of contaminant analysis.	A summary of field duplicate sample RPD results is presented as Table 3 in Appendix D. A summary of laboratory QC data is presented in laboratory reports in Appendix E. Both field and laboratory QC data quality was considered acceptable for the purpose of this assessment.

ITEM	DESCRIPTION	COMMENT
Laboratory analysis	The laboratories selected will meet WSP in-house compliance requirements under the respective ISO 9001 QA programs. They will perform their own internal QA/QC programs and will use appropriate detection limits for the analyses to be undertaken.	NATA accredited laboratory analytical certificates are presented in Appendix E. Laboratory QA/QC was considered acceptable for this assessment.
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. All extraction and analyses should be completed within standard guidelines.	No holding time exceedances were reported.
QA/QC Conclusion	The QA/QC indicators should either all comply with the required standards or show no variations that would have a significant effect on the quality of the data.	Natural sample heterogeneity was considered to account for any variations observed (i.e. elevated RPD results). Field QC indicated no variations considered to have an impact on the findings of the investigation were detected. Laboratory QC data was considered acceptable for the purpose of this assessment. A review of QA methods and QC data was undertaken and indicated appropriate data reliability for the purpose of this assessment.

5.5 GROUNDWATER CONDITIONS

The indicative groundwater conditions at the site are summarised in Table 5.6. It is noted that groundwater gauging occurred shortly after installation within clayey soils, and measured water levels may vary with time.

Additional groundwater gauging results (summarised below) and a calibration certificate for the water quality meter used during the gauging of monitoring wells are presented in Appendix F.

Table 5.6 Summary of groundwater conditions

DEPTH TO GROUNDWATER	The measured depth to groundwater (where encountered) ranged from 3.30 (MW02) to 3.39 (MW01) metres below ground level (mBGL). Groundwater was not encountered in MW03 (gauged on 20 and 24 May 2021), which was installed to a depth of 7.10 mBGL, and is located in the south of the precinct.
	It is noted that water was not encountered in MW01 on the day of installation (21 May 2021). The well was re-gauged on 24 May 2021 and water was encountered.
OBSERVATIONS	No odours were observed during drilling of groundwater wells and in the groundwater collected for water quality parameters.
GROUNDWATER OCCURRENCE	Groundwater was encountered within yellow-brown clay.
GRADIENT AND GROUNDWATER FLOW DIRECTION	Based on the groundwater gauging data and RTK dGPS survey of surface levels, the groundwater at the site has been inferred to flow towards the south / south-east, in the direction of Cardinia Creek and Western Port Bay. This is similar to the topography which slopes broadly towards the south. Inferred standing water levels (mAHD):
	— MW01: 26.16 mAHD at time of gauging.

	— MW02: 22.99 mAHD at time of gauging.
	— MW03: Dry at time of gauging. SWL inferred to be <15.7 mAHD.
	 It is noted that more detailed analysis of groundwater flow dynamics within the precinct may report flow patterns that differ to the preliminary inference provided in this report.
GROUNDWATER QUALITY	 Indicative electrical conductivity for the monitoring wells was between 12,210 μS/cm (MW01) and 12,463 μS/cm (MW02).
PARAMETERS	— pH was measured as at a level of 6.19 (MW01) and 6.09 (MW02) indicating that the regional groundwater is slightly acidic.
	 Dissolved oxygen was measured as 5.11 mg/L at MW02 and was below the instrument's level of sensitivity at MW01.
	 Field reduction/oxidation potential (Ag/AgCl probe) was measured as 167.2 mV at (MW01) and 154.0 mV at (MW02).
	Water quality parameters are provided in Table F1, Appendix F.
VISUAL AND OLFACTORY OBSERVATIONS	Groundwater was noted to be clear, not turbid, and did not have any discernible odours.

The elevated EC recorded is indicative that regional shallow groundwater has high salinity. This is consistent with findings published elsewhere for the region.

The absence of shallow groundwater towards the south of the precinct is consistent with published information indicating a transition to the deeper regional aquifer from the shallow groundwater associated with the clay soils in the precinct.

Based on preliminary groundwater investigations, it was considered that groundwater may be encountered during construction works, particularly in the north of the precinct within deeper excavations (e.g. service installation). Additionally, groundwater encountered by WSP was noted to be of high salinity, and slightly acidic.

No further inference can be made to aquifer properties based on the limited nature of the investigation, and further assessment would be required to ascertain potential inflow rates and potential impact on proposed infrastructure.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 EXTENT OF SODIC/DISPERSIVE SOILS AT THE PRECINCT

Based on the range of exchangeable sodium percentage (predominantly strongly to very strongly sodic) and dispersivity results (Emerson class predominantly 2) reported across the depth profile (up to 3.0 mBGL) and across the precinct, it should be assumed that all soils within the precinct are potentially dispersive and strongly (to very strongly) sodic, unless testing at a higher sampling density is undertaken to prove otherwise.

Depending on adopted construction methods, preventive measures may be required during construction, which should be confirmed during design and monitored and verified during construction.

6.2 EXTENT OF ACID SULFATE SOILS AT THE PRECINCT

Possible indicators of the presence of acid sulfate soils were observed throughout the precinct during the site walkover on 27 April 2021. This consisted of reeds (visible in select areas of the precinct, particularly along watercourses), possible iron-stained sand (observed in deep wheel ruts between Lecky Road and Cardinia Creek), and waterlogged soils and swampy areas (observed from Stephens Road and Officer South Road). No other potential indicators of acid sulfate soil occurrence were noted during the site inspection, (e.g. milky discharge, stressed vegetation, concrete corrosion, mid to dark grey to dark greenish-grey coloured soils or sediments, offensive odours).

No evidence of the presence of acid sulfate soils was observed in the subsurface during intrusive soil investigation works. Stained and/or odorous soils were not observed during sample collection. Neither marine nor swampy deposits were observed in the soil profiles encountered, and mottling was observed in all soil profiles (to the depth assessed), indicating that the soil profile has been exposed to periodic oxidising conditions.

The results of the initial screening analysis suggested actual acid sulfate soil may be present (3 samples) and a majority of samples reported a reaction to peroxide oxidation indicative that potential acid sulfate soil may be present (61 samples).

A total of 22 selected soil samples from 6 soil bore locations representing the most likely locations where AASS/PASS may be present were further analysed for chromium reducible sulfur.

The chromium reducible sulfur content of the soil (representing the risk of additional acidification potential as a result of sulfide oxidation) was low, in all cases below the action criteria (0.03 %S). The net acidity was less than the action criteria in 10 of the 22 tests. Where the threshold was met or exceeded this was largely due to the total actual acidity concentration rather than through oxidation of sulfides. This result indicates that the soil is naturally acidic, and has limited acid generating potential. The elevated reaction rates are likely attributable to the presence of organic material in soil samples, as well as small amounts of chromium reducible sulfur present in soil samples (below action levels).

While some boggy ground and traces of sulphides were identified, the shallow water table was generally >3.0m below the surface, indicating that oxidation has likely already occurred in the soil profile (to 3.0mBGL) during dry periods (further corroborated by mottled colour of the soil profiles).

The assessment findings at the Site align with the classification of the precinct within the Atlas of Australian Acid Sulfate Soils compiled by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (low likelihood of occurrence, low confidence).

Investigation of the areas identified as having elevated risk of the presence of acid sulfate soils by Aurecon (2020) were subject to sampling and analysis. It is considered no soils able to be affected considerably by the oxidation of sulfides were present in these areas.

Given that pH at the Site remains predominantly above the action criteria (pH_{field}), this supports that the reported trace sulfide content is not sufficient to greatly further affect soil acidity. As the assessment did not report evidence that acid sulfate soils were present (in assessed areas to the maximum depth of assessment, 3 mbgs), it is considered that the likelihood of encountering acid sulfate soils at the precinct is low.

6.3 VULNERABILITY ASSESSMENT

Both published data and the assessment undertaken indicated a low risk of acid sulfate soils being present within the precinct. The intrusive assessment extended to maximum of approximately 3 mBGL including surficial and intrusive observations and laboratory analyses, which were consistent with published data for the area. On the basis of the assessment undertaken, it was considered that the precinct presented a low risk of vulnerability to the presence and associated impact of acid sulfate soils. It is acknowledged that acidic soils were observed to be present within the precinct, but likely to be driven by a weak, less corrosive organic acid or very low traces of as-yet unoxidized sulphides within the vadose zone. Consideration may need to be made in relation to selection of building materials and sensitive plant species in the context of naturally acidic soils.

Sodic and dispersive soils are present at the Site. Therefore, the precinct is vulnerable to dispersion, which can lead to the development of tunnel and surface erosion resulting in an increased risk of damage to buildings and service infrastructure as a result of the undermining of foundations and/or slumping and collapse of ground into voids and cavities that have been formed. Dispersion can also create environmental hazards such as reduced water quality. Figure 5 and Figure 6, Appendix A, present a precinct scale indication of erosion vulnerability, based on sodicity and dispersivity for shallow (up to 0.5 metres deep) and deeper (0.5 - 3m) soils across the precinct using available laboratory data. Topography was not considered for these figures. The data was interpolated and averaged across the soil profiles. The heat maps are subject to the limitations of the investigation (see Section 6.5 below) but indicate areas across the precinct of higher vulnerability to erosion, particularly in deep soils (0.5 - 3m), but also in shallow soils (up to 0.5 m deep).

Therefore, precinct planning should incorporate management and mitigation measures for sodic/dispersive soils as identified in Section 6.4 below.

6.4 MANAGEMENT RECOMMENDATIONS

The following management recommendations are made to address the vulnerability of the precinct to dispersion of soils. No acid sulfate soils were identified during the assessment to a maximum depth of investigation of 3.0 mBGL.

6.4.1 POTENTIAL TREATMENTS

Soil compaction reduces dispersion potential. Compaction of clays should be specified to be close to the maximum dry density and at a moisture content 1% to 2% above Optimum Moisture Content to reduce tunnel erosion potential.

In areas where the proposed development is susceptible to dispersion (e.g. steep batter slopes), soils may need to be treated using chemical amelioration. Gypsum, for example, is effective in reducing the dispersion potential of soils. Gypsum increases the electrolyte concentration in the soil and displaces sodium with calcium in the clay structure.

6.4.2 POTENTIAL MANAGEMENT OPTIONS AND CONTROL MEASURES

Risks associated with dispersive soil sites can be managed through ground investigation and a combination of design and construction management.

Because the presence and severity of sodic and dispersive soils can vary over short distances, more detailed investigations may be required in specific areas depending on the susceptibility to dispersion.

Developments with excavations extending to depths of greater than 3.0 m may also require additional testing since no samples were recovered from depths below 3.0 m.

6.4.3 POTENTIAL INFRASTRUCTURE DESIGN AND CONSTRUCTION APPROACHES RELATED TO PUBLIC AND PRIVATE REALMS

In almost all cases, tunnel and surface erosion results from the surface disturbance of soil allowing rainwater or stormwater to come into contact with dispersible subsoils. Changes to hydrology, including concentrating flow in culverts, runoff from hardstand areas, ponding of rainfall and land contouring increases the risk of tunnel erosion. Typical activities that increase the risk of exposing dispersive subsoils to rainfall and stormwater include:

- the removal of topsoil;
- soil excavation and ground profiling;
- trenching and supply of services;
- road and culvert construction; and
- the construction of dams and detention basins.

6.4.3.1 **EARTHWORKS DESIGN**

Some of the risks presented by a potentially dispersive site can be managed through earthworks design.

The risk of dispersion can be reduced by minimising the extent and depth of areas of cut within areas of potentially dispersive soils and instead designing these areas to be at grade or in fill.

Areas of potentially dispersive soil which are designed to be in cut should be designed with surface protection to create separation and protection of the underlying soils from surface and rainwater. Surface protection may be provided through specification of 150 mm thick of non-dispersive topsoil, erosion protection geotextiles and/or hard surfacing. Topsoiled areas should be re-vegetated, ideally with a mix of vegetation types.

Areas of fill should be filled with non-dispersive soils unless the dispersive soils are designed by a geotechnical engineer to be encapsulated within non-dispersive soils.

Clearance of vegetation should be avoided on slopes with existing grades steeper than 20% which are to be retained.

The design of final site grades should aim to minimise slope gradients in areas of potentially dispersive soils in order to reduce the potential for dispersion as a result of flowing surface water. Final slopes in dispersive soils to be protected by topsoil and revegetation should be designed at gradients of less than 20% unless specifically designed in consultation with a geotechnical engineer.

UTILITY AND DRAINAGE DESIGN 6.4.3.2

Give preference to design of at-ground or above-ground utilities which avoid the need for trenching through areas of potentially dispersive soils. Any trenching that is required for services should be designed to avoid long runs down slope which could increase the chances of tunnel erosion occurring.

Trench sand blocks and barriers should be considered to reduce the potential for tunnel erosion along trenched utilities on slopes as proposed by Richley (Richley L R, 2000) in conjunction with chemical amelioration and/or precisely engineered compaction as necessary.

Consideration should be given to mounding trench backfill to avoid settling backfill creating sumps which will pond and channel surface water into the trench. Trench backfill above pipes, culverts and drains should include a cap of nondispersive soils.

Drainage design should avoid use of table drains, trenched pipes and culverts in areas containing dispersive soils. Captured runoff should instead be dissipated using diversion mounds constructed of non-dispersive soil and spread over as wide an area as possible and/or discharged into relatively erosion resistant areas such as garden beds mixed with gypsum, existing well vegetated areas with ample topsoil and stony elevated areas.

Runoff from areas of dispersive soils should not be designed to discharge directly to waterways or stormwater drains where it may adversely water quality. Rainwater tanks may be used to capture runoff from roofs and buildings and pipe overflow to relatively erosion resistant areas.

6.4.3.3 INFRASTUCTURE DESIGN

The construction of roads in areas of dispersive soil has the potential to increase the risk of surface or tunnel erosion. Cuttings are at risk of surface erosion, while embankments of dispersive soils are at risk of tunnel erosion, especially in areas of culverts and drains. In dispersive areas, roads should be designed without the need for cuttings and with fill consisting of non-dispersive soils.

Buildings are best located away from areas of dispersive soils or constructed on pier and post foundations to avoid disturbance of the soils below.

Construction of sewage and grey water disposal systems in dispersive subsoils presents a risk of tunnel erosion and should be avoided.

Dams and detention basins should be sited on and constructed of non-dispersive soils unless specifically designed by a geotechnical engineer.

6.4.4 POTENTIAL NON-STRUCTURAL CONTROL MEASURES

A construction management plan should be prepared in advance of the start of construction identified the hazards associated with dispersive soils and construction practices to mitigate their impact.

Sediment and erosion controls should be installed prior to the commencement of any works and maintained throughout the course of construction until disturbed areas have been revegetated/ established.

The amount of time land is exposed should be minimised though staged development and/or staged working where possible. Particular care should be taken to avoid allowing soils to desiccate and crack, since these soils are then vulnerable to tunnel erosion after heavy rainfall.

Soil compaction should be verified through geotechnical supervision and field and laboratory testing.

Stockpiling of dispersive soil should be avoided where possible. Stockpiles should be protected from surface and rainwater.

Earthworks surfaces should be shaped to avoid ponding of surface water and discharged to relatively erosion resistant areas (e.g. garden beds mixed with gypsum, existing well vegetated areas with ample topsoil and stony elevated areas) away from dispersive soils.

Exposed dispersive subsoils should be protected as soon as possible to protect them from rainfall and surface water.

Runoff from areas of dispersive soils should not be discharged directly to waterways or stormwater drains.

Topsoil should not be removed or land re-profiled unless this forms part of the final earthworks design.

6.5 ASSUMPTIONS AND LIMITATIONS OF THE INVESTIGATION

The following specific assumptions and limitations apply to this assessment. This report should also be read in consideration of the Limitations presented in Section 7 below.

- Variability: It should be noted that the presence and severity of dispersive soils can vary over short distances and so
 the testing represents the information at the sampling location and depth only care should be taken if inferring
 dispersive potential of soils in between sampling locations.
- Limited investigation depth: No testing has been done below 3 metres. Additional testing may be required if
 excavation is proposed at a depth greater than 3.0 m.
- Subsurface conditions are time dependent: Subsurface conditions may be modified by changing natural forces or man-made influences. Our investigation report is based on conditions which existed at the time of subsurface exploration.
- Limited number of investigation locations: In making an assessment of a site from a limited number of boreholes or test pits there is the possibility that variations may occur between test locations. Site exploration identifies specific subsurface conditions only at those points from which samples have been taken. The risk that variations will not be detected can be reduced by increasing the frequency of test locations; however, this often does not result in any overall cost savings for the project. The investigation program undertaken is a professional estimate of the scope of investigation required to provide a general profile of the subsurface conditions. The data derived from the site investigation program and subsequent laboratory testing are extrapolated across the site to form an inferred geological model and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite investigation the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies.

6.6 RECOMMENDATIONS FOR FURTHER ASSESSMENT

WSP has undertaken an assessment to support VPA's Strategic Planning for the Officer South Precinct. With reference to acid sulfate soils, sodic and dispersive soils, it was considered that the assessment undertaken was sufficient to support Strategic Planning Requirements. Further, the assessment is considered sufficient to assist the Statutory Planning Authority's (Council) decision making with regards to future Statutory Planning approvals, including the development of Planning Permit conditions to manage risk associated with acid sulfate soils, sodic and dispersive soils. Further assessment by a project proponent may be warranted in relation to management of site/development specific risk.

LIMITATIONS 7

This Report is provided by WSP Australia Pty Limited (WSP) for Victorian Planning Authority (Client) in response to specific instructions from the Client and in accordance with WSP's proposal dated 12 March 2021 and agreement with the Client dated 14 April 2021 (Agreement).

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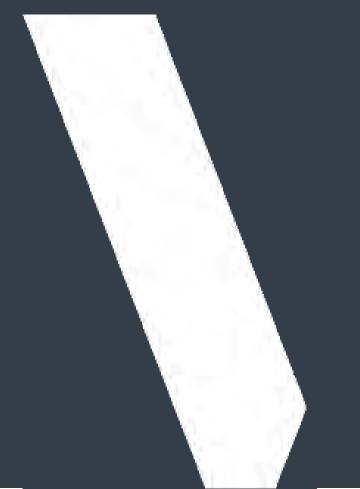
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APPENDIX A

FIGURES





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Sodic/Dispersive and
Acid Sulfate Soil Assessment,
Officer South Employment Precinct.
Victorian Planning Authority.

Figure 1: Borehole Location

Legend

- Address Points
- ♦ Bull Borehole Location (3 m deep)
- ♣ Bharante
 Bharante
- Nominated Groundwater Well Location (Under Review)
- Road
- Cadastre
- ☐ Precinct Boundary



Coordinate system: GDA 1994 MGA Zone 55

Date: 01-Jun-21

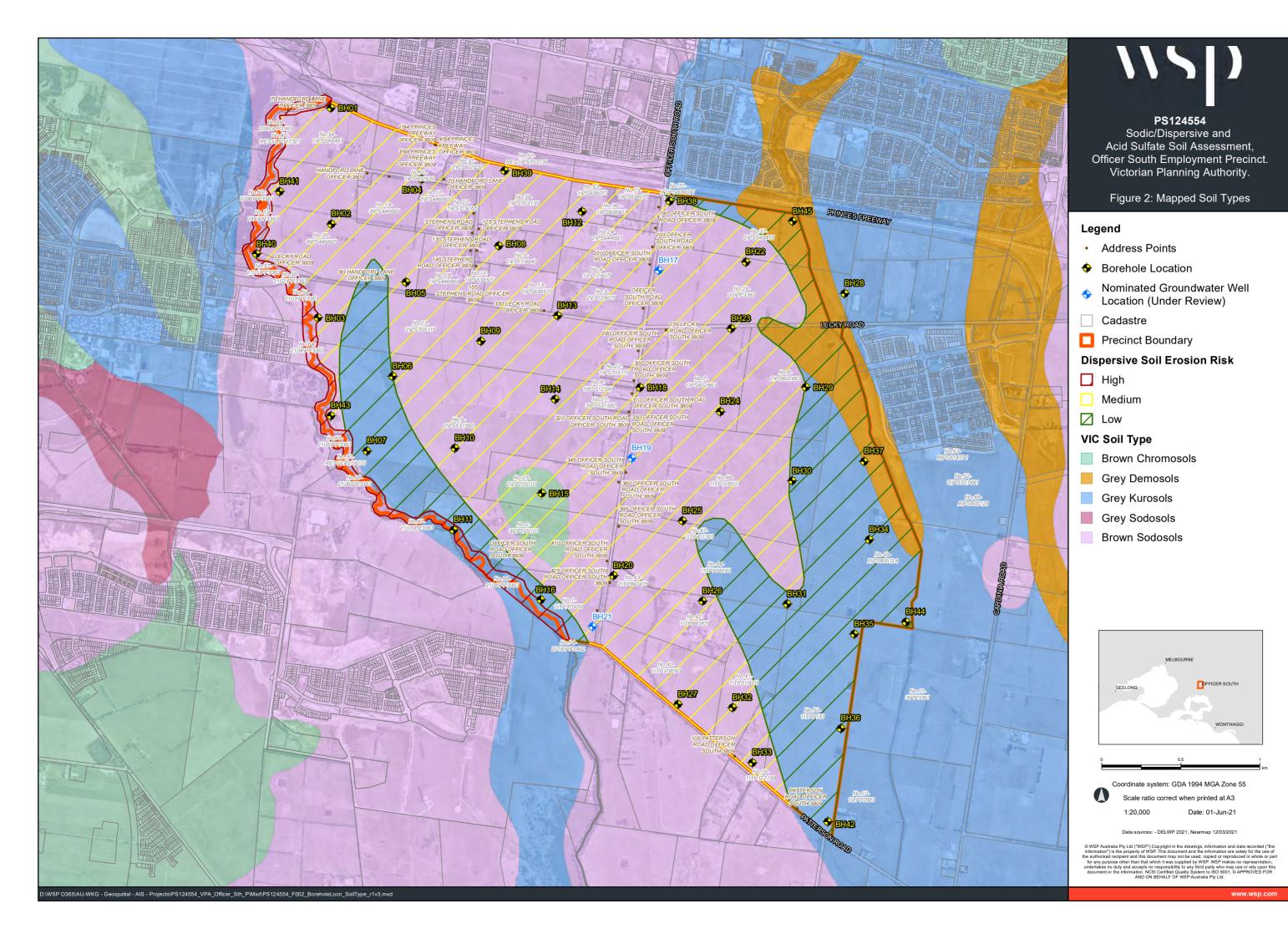
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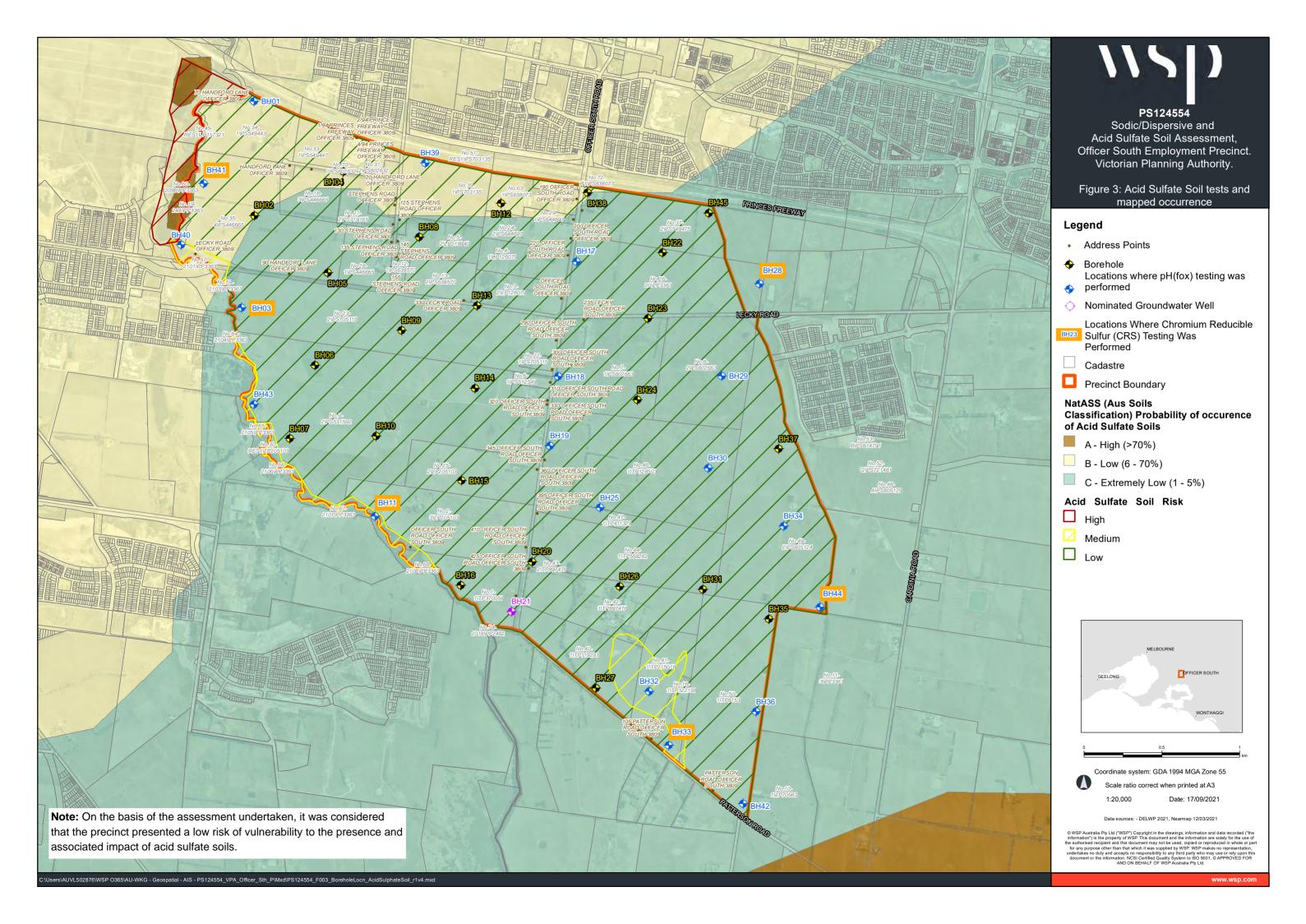
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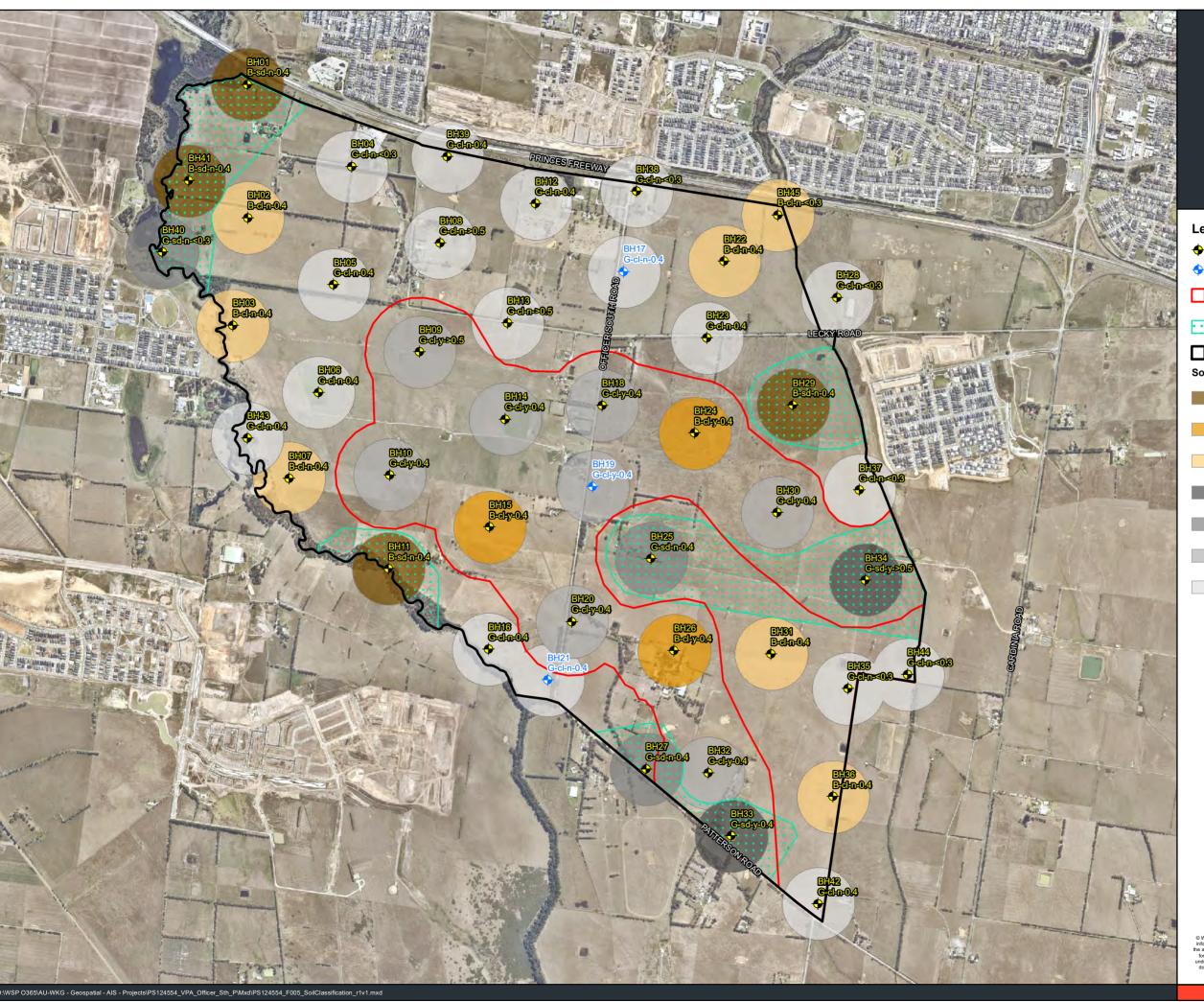
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Figure 4: Inferred Soil Profile

Legend

- Borehole Location
- Groundwater Well Location
- Lateral extent (inferred) of silty horizon overlying clay profile
- Lateral extent (inferred) of encountered sand strata below clay profile
- Precinct Boundary

Soil Classification (200m Buffer - visual)

- Brown clay colour, with sand at depth and no slit layer below topsoil
- Brown clay colour, no sand at depth and with slit layer below topsoil
- Brown clay colour, no sand at depth and no slit layer below topsoil
- Grey clay colour, with sand at depth and with slit layer below topsoil
- Grey clay colour, with sand at depth and no slit layer below topsoil
- Grey clay colour, no sand at depth and with slit layer below topsoil
- Grey clay colour, no sand at depth and no slit layer below topsoil



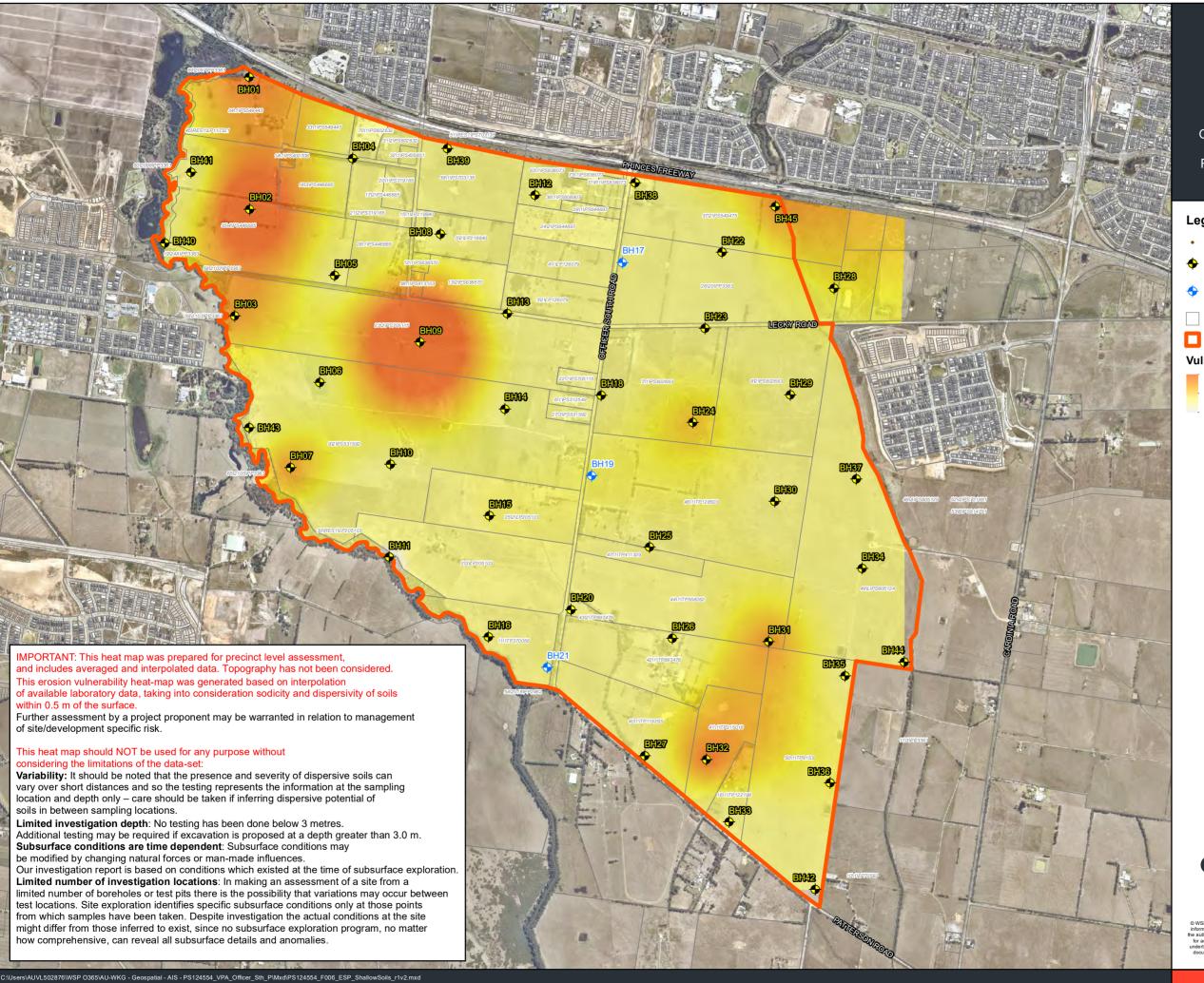
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Sodic/Dispersive and Acid Sulfate Soil Assessment, Officer South Employment Precinct. Victorian Planning Authority. Figure 5: Erosion Vulnerability Heat Map - Shallow Soils (up to 0.5m)

Legend

- Address Points
- Borehole Location
 - Nominated Groundwater Well Location
- Cadastre
- Precinct Boundary

Vulnerability - Shallow Soils

Higher

Lower

MELBOURNE

GEELONG

DFFICER SOUTH

WONTHAGGI

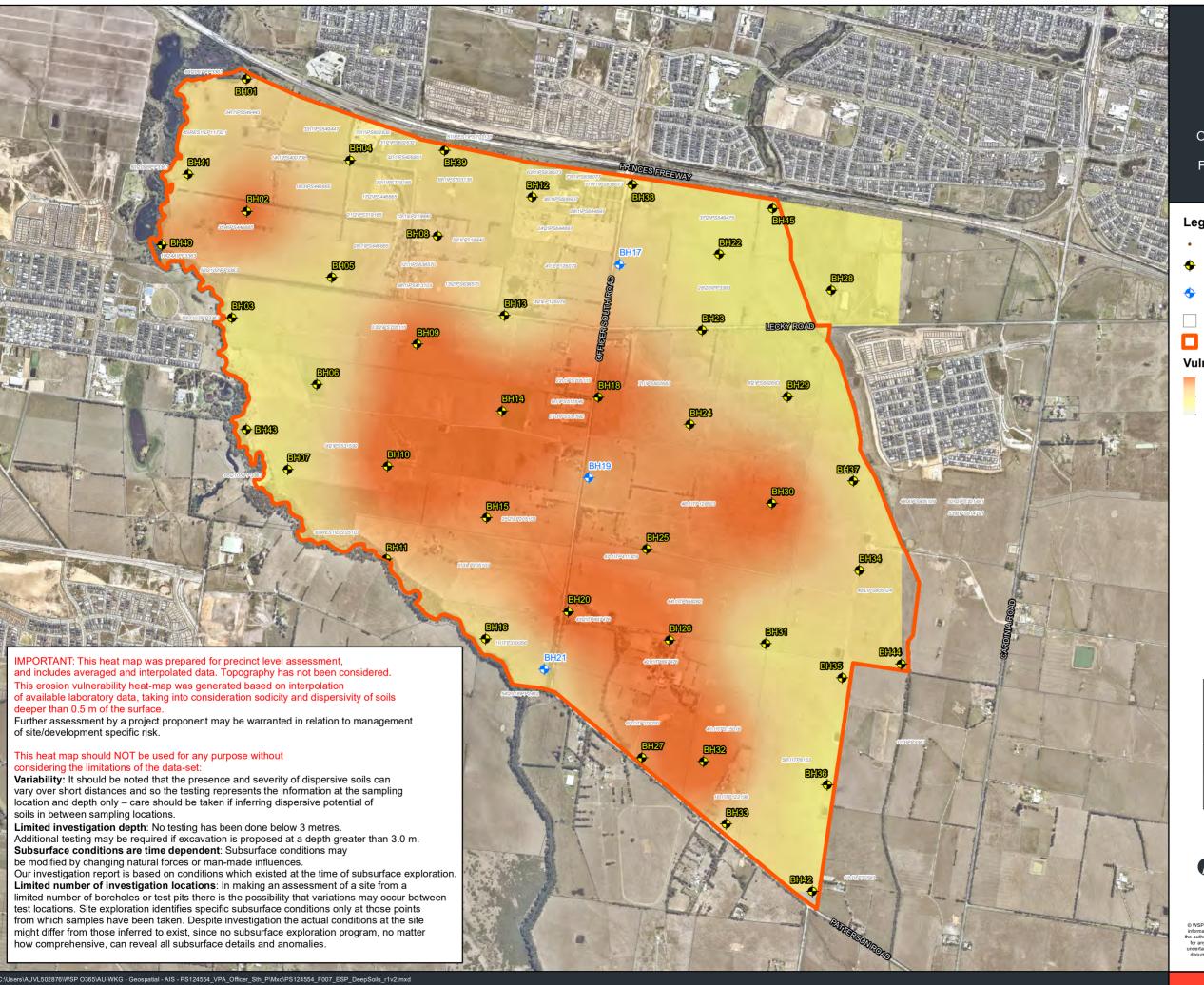
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Sodic/Dispersive and Acid Sulfate Soil Assessment, Officer South Employment Precinct. Victorian Planning Authority. Figure 6: Erosion Vulnerability Heat Map - Deep Soils (>0.5m - 3.0m)

Legend

- Address Points
- Borehole Location
 - Nominated Groundwater Well Location
- Cadastre
- Precinct Boundary

Vulnerability - Deep Soils

Higher

Lower

MELBOURNE

GEELONG

PFFICER SOUTH

WONTHAGGI

Coordinate system: GDA 1994 MGA Zone 55

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APPENDIX B

PHOTOGRAPHS





PROFILE 1: Brown clays					
BH02, BH03, BH07, BH2: Depth (m)	2, BH31, BH36, BH45	Lithology	Dispersive Soils Emerson Class	ESP (%)	Acid Sulfate Soils
0.0		Topsoil	2	14.8	Field pH 6.2 pH(ox) 2.3 - 4.4 Reaction Rate 3 - 4 Net Acidity 0.04 - 0.06%
0.5		Sandy CLAY	2	9.4 - 25.5	Field pH 5.9 - 6.2 pH(ox) 4.3 - 4.5 Reaction Rate 2 - 4
1.0		Silty CLAY	2	18.1 - 28.8	Field pH 6.0 - 7.2 pH(ox) 4.6 - 6.0 Reaction Rate 2
1.5					
2.0	Arter-Lo		2	15.3	Field pH 6.5 - 7.8 pH(ox) 5.6 - 8.0 Reaction Rate 2 -4



PROFILE 2: Brown clay	s - no sand - with silt				
BH15, BH24, BH26 Depth (m)		Lithology	Dispersive Soils Emerson Class	ESP (%)	Acid Sulfate Soils
0.0		Topsoil	N/A	N/A	N/A
0.5		Silty CLAY	2	8.6 - 14.1	N/A
1.0			2	19.4 - 25.8	N/A
1.5	Shr. to				
2.0			2 - 3	29.5 - 30.8	N/A



PROFILE 3: Brown clays - with sand BH01, BH11, BH29, BH41		ithology	Dispersive Soils		Acid Sulfate Soils
Depth (m) 0.0		opsoil	N/A	ESP (%) N/A	Field pH 5.4 - 7.3 pH(ox) 2.7 - 5.5 Reaction Rate 1 - 3 Net Acidity 0.06%
0.5			2 - 3	4.6 - 16.3	Field pH 5.2 - 8.1 pH(ox) 3.5 - 5.0 Reaction Rate 1 - 3 Net Acidity 0.02 - 0.06%
1.0			2 - 2	13.8 - 15.1	Field pH 5.2 - 6.8 pH(ox) 2.8 - 5.0 Reaction Rate 1 - 3 Net Acidity <0.02 - 0.08%
2.0	S	andy SILT	2 - 2	25.3 - 26.4	Field pH 5.7 - 7.5 pH(ox) 3.6 - 5.6 Reaction Rate 1 - 2 Net Acidity 0.04%
3.0			2 - 2	26.1 - 31.2	Field pH 6.5 - 8.0 pH(ox) 5.3 - 5.8 Reaction Rate 1 - 2 Net Acidity <0.02%



PROFILE 4: Grey clays - no sand - no silt BH04, BH05, BH06, BH08, BH12, BH13, BH16, BH17, BH21, B	8H23, BH28, BH35,			
BH37, BH38, BH39, BH42, BH43, BH44 Depth (m)	Lithology	Dispersive Soils Emerson Class	ESP (%)	Acid Sulfate Soils
	Topsoil Silty CLAY	2	4.3 - 23.8	Field pH 5.2 - 5.8 pH(ox) 2.8 - 3.5 Reaction Rate 1 - 3 Net Acidity 0.04%S
		2	13 - 21	Field pH 5.2 - 6.1 pH(ox) 3.6 - 4.3 Reaction Rate 2 Net Acidity 0.02%
1.5		2	18.6 - 30	Field pH 6.0 - 7.4 pH(ox) 4.9 - 5.7 Reaction Rate 1 - 2 Net Acidity 0.04%
3.0		2 N/A	30.8 - 33.3 N/A	Field pH 6.5 - 7.5 pH(ox) 5.6 - 5.7 Reaction Rate 1 - 2 Net Acidity 0.03% Field pH 6.4 - 7.7 pH(ox) 5.7 - 6.0 Reaction Rate 1 - 2
				Net Acidity 0.03% - 0.04%



PROFILE 5: Grey clays - no sand BH09, BH10, BH14, BH18, BH19 Depth (m)	d - no silt , BH20, BH30, BH32	Lithology	Dispersive Soils Emerson Class	ESP (%)	Acid Sulfate Soils
0.0		Topsoil	2	14.8	Field pH 6.2 pH(ox) 2.3 - 4.4 Reaction Rate 3 - 4
0.5		SILT	2	9.4 - 25.5	Field pH 5.9 - 6.2 pH(ox) 4.3 - 4.5 Reaction Rate 2 - 4
1.0		Silty CLAY	2	18.1 - 28.8	Field pH 6.0 - 7.2 pH(ox) 4.6 - 6.0 Reaction Rate 2
1.5					
			2	15.3	Field pH 6.5 - 7.8 pH(ox) 5.6 - 8.0 Reaction Rate 2 -4
3.0					



PROFILE 6: Grey clays	- with sand - no silt	المالة	Diameter College		Acid Culfate Calls
BH25, BH27, BH40 Depth (m)		Lithology	Dispersive Soils Emerson Class	ESP (%)	Acid Sulfate Soils
0.0		Topsoil	2	3.7	Field pH 5.9 - 7.2 pH(ox) 2.6 - 6.9 Reaction Rate 3
0.5		Silty CLAY	2	16.4	Field pH 6.2 - 6.9 pH(ox) 4.5 - 5.0 Reaction Rate 2
1.0			2	29.4	Field pH 6.2 - 7.9 pH(ox) 4.9 - 6.2 Reaction Rate 1 - 2
1.5	84125-1.8	SAND			Field pH 6.6 - 7.7
2.0			2	22.7	pH(ox) 5.5 - 6.6 Reaction Rate 1 - 3



PROFILE 7: Grey clays - with sand - with silt BH33, BH34 Denth (m)	Lithology	Dispersive Soils	FCD (0/\	Acid Sulfate Soils
0.0	Topsoil	N/A	N/A	Field pH 5.9 - 6.0 pH(ox) 3.8 - 4.1 Reaction Rate 3 - 4 Net Acidity <0.02%
0.5	SILT	2	8.4	Field pH 6.0 - 7.5 pH(ox) 3.7 - 5.3 Reaction Rate 3 - 4 Net Acidity 0.02%
1.0	Silty CLAY	2	21.6	Field pH 7.1 - 7.2 pH(ox) 5.0 - 5.4 Reaction Rate 2 Net Acidity <0.02%
2.0 8h33-2·0	Clayey SAND	2	21.9	Field pH 5.6 - 6.0 pH(ox) 4.4 - 4.8 Reaction Rate 1 - 2 Net Acidity 0.03%
3.0	City Cy JAND	N/A	N/A	Field pH 6.2 - 7.2 pH(ox) 5.0 - 5.8 Reaction Rate 1



Client Name

Victorian Planning Authority

Site Location
Officer South Employment Precinct

Project No. PS124554

Pnoto	NO.
Point10_S	SP008

Date 27 Apr 2021

Description

Erosion on bank of tributary of Cardinia Creek, on Officer South Road.

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	CAPE TO THE PARTY OF THE PARTY

Photo No.
Point14_Photo 1

Date 27 Apr 2021

Description

Potential signs of soil pocketing above a service on Patterson Road.





Client Name

Victorian Planning Authority

Site Location
Officer South Employment Precinct

Project No. PS124554

Photo No.

Date

Point16_SSP013

27 Apr 2021

Description

Basalt beaching on a drain to avoid erosion, on Officer South Road.



Photo No.

Point21_SSPH017

Date 27 Apr 2021

Description

Water logging on farmers lots, on Officer South Road.





Client Name

Victorian Planning Authority

Site Location
Officer South Employment Precinct

Project No. PS124554

Photo No.

Point22_SSP018

Date 27 Apr 2021

Description

Erosion of bank on east side of Officer South Road.



Photo No.

Point29_Photo 5

Date 27 Apr 2021

Description

Erosion seen from west end of Lecky Road on dam.





Client Name

Victorian Planning Authority

Site Location
Officer South Employment Precinct

Project No. PS124554

Photo No.

Date

Point32_SPH023 27 Apr 2021

Description

Water logging in ruts on west end of Lecky Road.



Photo No.

Date

Point39_SPH024 | 27 Apr 2021

Description

Dribble pattern above telecom service on Handford Lane.





Client Name

Victorian Planning Authority

Site Location
Officer South Employment Precinct

Project No. PS124554

Photo No.

Date

Point49_SPH029

27 Apr 2021

Description

Stormwater treatment dam with sedimented water on north boundary of site, behind service station.



Photo No.

Date

Point58_Photo 1

27 Apr 2021

Description

Dribble pattern on soil near Cardinia Creek.





Client Name

Victorian Planning Authority

Site Location
Officer South Employment Precinct

Project No. PS124554

Photo No.

Date

Point61_Photo 2

27 Apr 2021

Description

Dam north west of site, with no visible sign of discolouration.





Client Name

Victorian Planning Authority

Site Location Officer South Employment Precinct Project No. PS124554

Photo No.

Date

Point13_ASP001 | 27 April 2021

Description

Patterson Road:

Looking north from Patterson Road in the area where there has been 'medium' potential for the occurrence of acid sulfate soils mapped.

Unable to access the site. However, there didn't appear to be any visual indicators of acid sulfate soils, other than potentially swampy conditions.



Photo No.

Date

Point64 ASP002 27 April 2021

Description

Officer South Road:

Looking east from the entrance of Jesmond Dene Stud.

Potential reeds were visible in the background.





Client Name

Victorian Planning Authority

Site Location Officer South Employment Precinct Project No. PS124554

Photo No.

Date

Point66_ASP004 27 April 2021

Description

Officer South Road:

Looking west from Officer South Road.

Waterlogged soil was observed in this area.



Photo No.

Date

Point67_ASP005 | 27 April 2021

Description

Track west of Lecky Road:

Access track to Cardinia Creek west of Lecky Road.

Red sand was observed in deep wheel ruts along the track.





Client Name

Victorian Planning Authority

Site Location Officer South Employment Precinct Project No. PS124554

Photo No.

Date

Point68_ASP006 | 27 April 2021

Description

Stephens Road:

Looking west from halfway along Stephens Road.

Reeds were visible in a watercourse.



Photo No.

Date

Point70_ASP007 27 April 2021

Description Stephens Road:

Looking east from halfway along Stephens Road.

Soil was potentially waterlogged and frogs were audible.





Client Name

Victorian Planning Authority

Site Location Officer South Employment Precinct Project No. PS124554

Photo No.

Date

Point72_ASP009 | 27 April 2021

Description

Officer South Road:

Looking north from Officer South Road, just south of the Princes Freeway.

Swampy conditions were observed.



Photo No.

Date

Point74 ASP011 27 April 2021

Description Cardinia Creek:

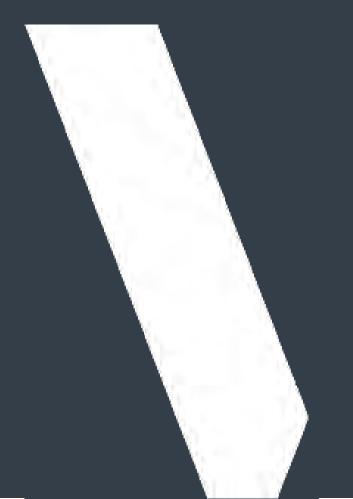
Looking north from an access track to the west of Cardinia Creek in the north of the precinct.

Reeds present on the banks of the creek and the adjacent overflow dams.



APPENDIX C

BOREHOLE LOGS AND BORE CONSTRUCTION LICENCES (GROUNDWATER)





Explanatory Notes - Engineering Logs

Engineering logs have been prepared in accordance with AS1726:2017 "Geotechnical Site Investigations" and as defined below

DRILLING/EXCAVATION METHODS

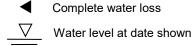
Symbol	Term
CC	Concrete Coring
AS	Auger Screwing
EX	Excavation
HA	Hand Auger
NMLC/HMLC	Diamond Core –triple tube
NQ/HQ/PQ	Diamond Core – wireline
PC	Percussion
PCB	Poly Carbonised Diamond Bit
PT	Push Tube
RAB	Rotary Air Blast
RC	Reverse Circulation
S	Sonic drill
VB	Vibrocoring
WB	Washbore with blade
WR	Washbore with roller (tricone)

SUPPORT

C Casing M Drill mud Nil No support

WATER

→ Partial water loss
→



NFGWO No Free Groundwater Observed

The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.

Water inflow

NFGWE No Free Groundwater Encountered

The borehole/test pit was dry soon after excavation. Inflow may have been observed had the borehole/test pit been left open for a longer period.

FIELD TEST (Soil borehole and test pit logs)

DM Dilatometer test HB Hammer bounce

OT Other test (eg. plate load test)

PE Permeability test
PM Pressuremeter test
PP Pocket penetrometer
SPT Standard penetration test

SV Shear vane test

SAMPLE (Soil borehole and test pit logs)

B Bulk disturbed sample
D Disturbed sample
PT Push tube

SPT SPT sample
U50 Undisturbed sample in 50mm diameter tube
U75 Undisturbed sample in 75mm diameter tube

GRAPHIC LOG – Page 03

TOTAL CORE RECOVERY (Rock logs only)

TCR (%) = $\frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100$

ROCK QUALITY DESIGNATION (Rock logs only)

RQD (%) = $\frac{\sum \text{Length of sound core pieces} > 100 \text{mm}}{\text{Length of core run}} \times 100$

GROUP SYMBOL (Soil borehole and test pit logs)

Soils are classified to reflect their primary and significant secondary component/characteristic using the classification symbols described in AS1726-2017, summarised as follows.

Symbol	Major division	Typical names
GW, GP		Gravel & gravel-sand mixtures, little/no fines
GM	GRAVEL	Gravel-silt & gravel-sand-silt mixtures
GC		Gravel-clay & gravel-sand-clay mixtures
SW, SP		Sand & gravel-sand mixtures, little/no
SM	SAND	Sand-silt mixtures
SC		Sand-clay mixtures
ML	SILT &	Inorganic silt/clayey fine sand or silt
CL, CI	CLAY (low & medium	Inorganic clay, gravelly clay, sandy clay
OL	plasticity)	Organic silt
MH	SILT &	Inorganic silt
CH	CLAY	Inorganic clay, high plasticity
ОН	(high plasticity)	Organic clay, med-high plasticity, organic silt
Pt	Highly organic soil	Peat, highly organic soil

FIELD DESCRIPTION

Soil and rock materials described to AS1726-2017. The description of percentage of cobbles and boulders in a soil may be limited by sample size.

MOISTURE CONDITION

Coarse grained soils and rocks
Dry (D), Moist (M) or Wet (W).
Estimated based on appearance and feel.

Cohesive soils

MC <pl< th=""><th>Moist, dry of plastic limit</th></pl<>	Moist, dry of plastic limit
MC≈PL	Moist, near plastic limit
MC>PL	Moist, wet of plastic limit
MC≈LL	Wet, near liquid limit
MC>LL	Wet, wet of liquid limit

Estimated based on judgement

COHESIVE SOILS - CONSISTENCY

The consistency of a cohesive soil is assessed by tactile means or field measurement of undrained shear strength.

A Hand Penetrometer may be used in the field or the laboratory to provide approximate assessment of unconfined compressive strength of cohesive soils (kPa) as follows:

			.,
Strength	Symbol	Indicative undrained shear strength (kPa)	Hand Penetrometer Reading (kPa)
Very Soft	VS	≤ 12	< 25
Soft	S	>12 and ≤ 25	25 to 50
Firm	F	> 25 and ≤ 50	50 to 100
Stiff	St	>50 and ≤ 100	100 to 200
Very Stiff	VSt	> 100 and ≤ 200	200 to 400
Hard	Н	>200	> 400
Friable	Fr	-	-

COHESIONLESS SOILS - RELATIVE DENSITY

Relative density terms are used to describe silty and sandy material, and these are usually based on resistance to drilling penetration or the Standard Penetration Test (SPT) 'N' values.

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The Standard Penetration Test (SPT) is carried out in accordance with AS 1289, 6.3.1. For completed tests the number of blows required to drive the split spoon sampler 300 mm is recorded as the N value. For incomplete tests the number of blows and the penetration beyond the seating depth of 150 mm are recorded. If the 150 mm seating penetration is not achieved the number of blows to achieve the measured penetration is recorded. SPT correlations may be subject to corrections for overburden pressure and equipment type.

Term	Symbol	Density Index	N Value (blows /0.3 m)	DCP (blows/100 mm)
Very Loose	VL	0 to 15	0 to 4	0 to 1
Loose	L	15 to 35	4 to 10	1 to 2
Medium Dense	MD	35 to 65	10 to 30	2 to 5
Dense	D	65 to 85	30 to 50	5 to 10
Very Dense	VD	>85	>50	>10

SOIL STRUCTURE

Soil structure is described to AS 1726-2017 if visible and present.

SOIL / ROCK ORIGIN

The geological origin of the soil or rock is presented as an interpretation of the geological and geomorphological setting. Origin cannot be deduced on the basis of material appearance and properties alone and is therefore limited by the availability of supporting geological information

ROCK MATERIAL WEATHERING

Rock weathering is described mainly using the following abbreviations and definitions used in AS1726.

Term	Symbol	Definition
. 31111	2,	
Residual soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	Rock shows no sign of decomposition of individual minerals or colour changes.

If differentiation between highly and moderately weathered rock is not practicable, then Distinctly Weathered (DW) is used as defined in AS1726:2017.

INFERRED ROCK STRENGTH

Rock strength is inferred based on field assessment, Point Load Index(AS4133.4.1) or Uniaxial Compressive Strength (AS 4133.4.2.1) as follows:

Term	Symbol	UCS (MPa)	Point Load Index Is ₍₅₀₎ (MPa)
Very Low	VL	0.6 to 2	0.03 to 0.1
Low	L	2 to 6	0.1 to 0.3
Medium	М	6 to 20	0.3 to 1
High	Н	20 to 60	1 to 3
Very High	VH	60 to 200	3 to 10
Extremely High	EH	>200	>10



Diametral Point Load Index test Axial Point Load Index test

DEFECT SPACING/BEDDING SPACING (Rock)

Measured at right angles to defects of same set or bedding.

Term	Defect Spacing	Bedding
Extremely closely spaced	<6 mm 6 to 20 mm	Thinly Laminated Laminated
Very closely spaced	20 to 60 mm	Very Thin
Closely spaced	0.06 to 0.2 m	Thin
Moderately widely spaced	0.2 to 0.6 m	Medium
Widely spaced	0.6 to 2 m	Thick
Very widely spaced	>2 m	Very Thick

DEFECT DESCRIPTION (Rock)

Symbol	Term	Symbol	Term
Bg	Bedding	DB	Drill Break
Pt	Parting	Se	Seam
Cn	Contact	SZ	Sheared Zone
Bd	Boundary	CZ	Crushed Zone
Jt	Joint	F	Fault
Fo	Foliation	Vn	Vein
С	Cleavage		

DEFECT ORIENTATION (Rock)

Dip measured relative to the horizontal plane in vertical boreholes and relative to core axis in inclined boreholes.

DEFECT ROUGHNESS AND SHAPE (Rock)

Roughness	Description	Roughness	Description
Sm	Smooth	Po	Polished
Ro	Rough	SI	Slickensided
VRo	Very Rough		
Shape	Description	Shape	Description
Shape Pl	Description Planar	Shape Cu	Description Curved
•	•	•	•
Pl	Planar	Cu	Curved

COATING OR INFILLING (Rock)

Abbreviation	Description	Abbreviation	Description
Cln	Clean	Со	Coal
Cg	Coating	Cr	Crushed rock
In	infill	Fe	Limonite/ironstone
Sn	Stain	FI	Feldspar
Vr	Veneer	Gp	Gypsum
Ca	Calcite	Mn	Manganese
Ch	Chlorite	Ру	Pyrite
CI	Clay	Qz	Quartz

Revised 01/08/2017 Page 2



Graphic Symbols — Soils and Rocks

Typical symbols for soils and rocks are as follows. Combinations of these symbols may be used to indicate mixed materials such as clayey sand.

SOIL SYMBOLS		ROCK SYMBOLS	
Main components		Sedimentary Rocks	
	CLAY		SANDSTONE
	SILT		SILTSTONE
	SAND		CLAYSTONE, MUDSTONE
	GRAVEL		SHALE
399	BOULDERS / COBBLES		COAL
	TOPSOIL		LIMESTONE
	PEAT		CONGLOMERATE
Minor components		Igneous rocks	
Minor components	CLAYEY	t + + + + + + + + + + + + + + + + + +	GRANITE
Minor components	CLAYEY	t	GRANITE BASALT
Minor components		++++ +++ +++	
Minor components	SILTY	++++ +++ +++	BASALT
OTHER MATERIAL	SILTY SANDY GRAVELLY	*+*+* *+*+* *************************	BASALT
	SILTY SANDY GRAVELLY	*+*+* *+*+* *************************	BASALT UNDIFERENTIATED IGNEOUS
	SILTY SANDY GRAVELLY SYMBOLS	*+*+* *+*+* *************************	BASALT UNDIFERENTIATED IGNEOUS SLATE, PHYLLITE, SCHIST

Revised 01/08/2017 Page 3



BH01

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

STRUCTURE AND ADDITIONAL STRUCTURE AND ADDITIONAL STRUCTURE AND ADDITIONAL TOPSOIL: Sandy CLAY: Medium plasticity, light brown. TOPSOIL: Sandy CLAY: Medium plasticity, light brown. TOPSOIL: Sandy CLAY: Medium plasticity, light brown. BH01-0.1 BH01-1.0 BH01-2.0 END OF BOREHOLE AT 3.00 m	_	_ B(orer	IOIE	IIIIOIII	nation				Field Material De	SCI	iption	
Drown, slightly moist, rootlets. BH01-0.1 CL Sandy CLAY: Medium plasticity, light brown, elightly moist. BH01-0.5 BH01-1.0		SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	8778 008 008	STRUCTURE AND ADDITIONAL OBSERVATIONS
3 J CL Clayey SAND: Fine-medium, yellow-brown, moist. BH01-2.0	Т				-		J			TOPSOIL: Sandy CLAY, low plasticity, dark brown, slightly moist, rootlets.			—— ВН01-0.1
J / CL Clayey SAND: Fine-medium, yellow-brown, moist. — BH01-2.0					0.50		J		CL	Sandy CLAY: Medium plasticity, light brown, slightly moist.			—— BH01-0.5
BH01-2.0					-		J					$\square - \square - \square$	—— BH01-1.0
			N		-				CL	Clayey SAND: Fine-medium, yellow-brown, moist.			
			ZH QS		-3-		J	7.∴. 7		END OF BOREHOLE AT 3.00 m			—— BH01-3.0



BH02

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

	rill Model/Mounting: Ezi-Probe prehole Diameter: 60 mm Borehole Information						!	Bearing: Co-ords: E 358097.5269 N 5						358097.5269 N 5784404.709			
$\overline{}$	В	orel	ole	Inforn	nation	ion Field Materi							ip	tio	n		
METHOD	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCR	RIPTION		MOISTURE	FB.		STENO OLIVINION CONTRACTOR CONTRA	20	STRUCTURE AND ADDITIONAL OBSERVATIONS
PΤ			_			J)))	TOPSOIL: Sandy CLAY, low plasticity, brown, slightly moist, rootlets.	dark							—— BH02-0.1
				. 0.30		J		CL	Sandy CLAY: Medium plasticity, yellow slightly moist.	-brown,				+	 		—— BH02-0.5
				1.00 -1 -	-	J		CL	Silty CLAY: Medium plasticity, yellow-b slightly moist.	rown,							——————————————————————————————————————
		z⊩φ ≷ 0		- 2 -		J			END OF BOREHOLE AT 2.00 m								— BH02-2.0
				-3-													



BH03

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

or	eho				60 mn	•	_		Bearing:		ords		358013.4117 N 5783810.635
	В	orel	iole Ir	ntorm	ation				Field Materia	al De	scri	iption	
METHOD	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY/ CONSISTENCY BL S SL LS H	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT				-		J			TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist.	n,			— BH03-0.1 DUP07-210521 DUP08-210521
			c	-		J		CL	Silty CLAY: Low plasticity, light brown, slightly moist.				——————————————————————————————————————
				50		J		CL	Medium plasticity, grey. High plasticity, orange mottle.				
				-2 -		J							—— вноз-2.0
		Ž	2			J		CL	Sand inclusions.				—— вноз-з.о
_		ZF080		-3			r+12		END OF BOREHOLE AT 3.00 m				



BH04

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 SG Project Number: Log Checked By:

Orill Model/Mounting: Borehole Diameter:	Ezi-Probe 60 mm	Hole Angle: 90° Bearing:	Surface RL: Co-ords: E 358668.9879 N 5784687.435					
Borehole Inforn	nation	Field Material Description						
METHOD SUPPORT WATER RL(m) DEPTH(m)	FIELD TEST SAMPLE GRAPHIC LOG USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	RELATIVE DENSITY/ CONSISTENCY STRUCTURE AND ADDITIONAL OBSERVATIONS SOLUTIONS STRUCTURE AND ADDITIONAL OBSERVATIONS					
PT	J CL	FILL: Gravelly CLAY, low plasticity, dark brown slightly moist. Silty CLAY: Medium plasticity, grey with orangement of the control of the co	n,					
-	J	mottle, slightly moist, trace sand.	BH04-0.5					
-1-			BH04-1.0					
N F C C C C C C C C C C C C C C C C C C	J 1	END OF BOREHOLE AT 2.00 m	BH04-2.0					



BH05

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting: iameter:	Ezi-Pro 60 mm					Surfa Co-c		eRL: s: E	358569.9532 N 5784034.826	
Borehole Inform			nation			Field Material Description							
MELHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY / CONSISTENCY BLANCE DENSITY / CONSISTENCY BLANCE DENSITY / CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
ग					J			TOPSOIL: Silty CLAY, low plasticity, dark brown slightly moist.				— BH05-0.1	
			-1 -		J		CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.				—— BH05-0.5 —— BH05-1.0	
		zμφξο	-2 -		J			END OF BOREHOLE AT 2.00 m				—— BH05-2.0	
			-3-	-									



BH06

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting: iameter:	60 mm					Surra Co-c		eRL: s: E	358485.8378 N 5783440.752
Borehole Inform			nation		Field Material Description							
UOL I IIM	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY/ CONSISTENCY BL S S S S S S S S S S S S S S S S S S S	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT					J			TOPSOIL: Silty CLAY, low plasticity, dark brown slightly moist.				— BH06-0.1
			-1 -		J		CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.				——————————————————————————————————————
		Zμφ § Ο	-3-		J			END OF BOREHOLE AT 2.00 m				— ВН06-2.0



BH07

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

ore	eho	ie D	iaiiii	eter.	60 m	m			Bearing:	Co-)IU:	s. L	358323.379 N 5782968.994
_	В	orel	ole	Inforn	nation				Field Materia	al De	scr	iption	
	SUPPORT	WATER	حلا(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY OF THE PROPERTY	STRUCTURE AND ADDITIONAL OBSERVATIONS
T	0,	_		-		J		ו	TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist.	n,	_		—— BH07-0.1
				0.30		J		CL	Silty CLAY: Low plasticity, brown with orange mottle, slightly moist.				—— BH07-0.5
				-1-		J		CL	Medium plasticity.				—— вно7-1.0
				-2-		J							—— BH07-2.0
		ZF080		-3 -		J			END OF BOREHOLE AT 3.00 m				— вно7-3.0
		Ö											



BH08

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 SG Project Number: Log Checked By:

			Mounting: iameter:	60 mm	be			Hole Angle: 90° Bearing:	Surl Co-				L:		Ε	359156.8409 N 5784265.074
	В	orer	ole Inforn	nation				Field Materia	l De	scr	rip	ot	io	n		
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	HELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	FB	5	<u>ا</u> _!	STEN ON LON	25	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT			-		J			TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist.	١,							— вно8-0.1
			0.80 ———		J							 				—— вно8-0.5
			-1 -		J		ČĹ	Silty CLAY: Low plasticity, grey with orange mottle, slightly moist.				-	,			—— вно8-1.0
		ZH	-		J										. — — — — — — — —	—— вно8-2.0
		-φ≥ο	-2					END OF BOREHOLE AT 2.00 m								
			-3-													



BH09

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting: iameter:	60 mm			Hole Angle: 9 6 Bearing:	0° Surface RL: - Co-ords: E 359043.6523 N 5783663.944
	В	orer	ole Inforn	nation			Field	Material Description
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DESC	RIPTION RELATIVE DENSITY / CONSISTENCY STRUCTURE AND ADDITIONAL OBSERVATIONS SOUL SOLES SOUL SOLES SOUL SOLES SOUL SOLES SOLES
Т			-	-	J		TOPSOIL: Silty CLAY, low plasticity, of slightly moist.	
			-1 - -1 - -1.30	-	٦		Clayey SAND: Medium, brown, wet. Silty CLAY: High plasticity, grey with comottle, slightly moist.	range
		o≶¢nz	- -2-	-	J		END OF BOREHOLE AT 2.00 m	
		Ö	-3-					



BH10

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			iame		Ezi-Pı 60 mn				Hole Angle: 90° Bearing:	Surf Co-				•	Ε	358879.2277 N 5782985.927
_	В	orel	ole I	nforn	nation				Field Mater	al De	scr	ip	tic	on		
20	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	<u>B</u>	٦_	ATIV	VD	STRUCTURE AND ADDITIONAL OBSERVATIONS
T				0.30	_	J			TOPSOIL: Silty CLAY, low plasticity, dark brown slightly moist.		_					—— BH10-0.1
				0.50				ML	SILT: Low plasticity, light brown, slightly moist							
				-		J		CL	Silty CLAY: Medium plasticity, grey with orang mottle, slightly moist.							—— BH10-0.5
				-1 - - -		J										—— BH10-1.0
		N		-				CL	High plasticity.							
		Σ ΨΦ\$Ο		-3-		J			END OF BOREHOLE AT 2.00 m							—— BH10-2.0



BH1¹

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

	ehol				nation				Bearing: Co- Field Material De				358872.0558 N 5782470.065
7	00	Ji el	IOIE		iauUII				Field Material De	-3C	U1 1	Puon	
WE I I O	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTIBE	1000	RELATIVE DENSITY / CONSISTENCY MACHINE DENSITY / CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
Т				-		J			TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist.				—— ВН11-0.1
						J		CL	Silty CLAY: Low plasticity, pale brown-orange, slightly moist.				—— BH11-0.5
				-1-		J							—— ВН11-1.0
				-2 - 2 20		J					_		—— ВН11-2.0
		N		-					Sandy SILT: Firm, pale grey-orange, slightly moist.				
		Z⊩0\$0	l	-3 -		J	I. 1. h.			1			— BH11-3.0



BH12

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Project: Sodic/Dispersive Soils and ASS Assessment 19/5/21 Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

	ehol	le D	iameter:					Bearing:	Co-c	rds		359683.1074 N 5784481.726
$\overline{}$	В	orer	ole Info	rmation				Field Materia	I Des	scr	iption	
ME :: 100	SUPPORT	WATER	RL(m)	DEPTH(m)	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
T				-				FILL: Gravelly SAND, fine, yellow-brown, moist.				No samples collected. Fill understood to be imported sand for horse training area.
			0.50 —	-	J		_	TOPSOIL: Sandy CLAY, low plasticity, dark brown, slightly moist.				——————————————————————————————————————
			1.00 =4	-	J		CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.				——————————————————————————————————————
		Ζμφ≷Ο	-3	-	J	<u> </u>		END OF BOREHOLE AT 2.00 m				—— BH12-2.0



BH13

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			iamet		Ezi-Pı 60 mr				Hole Angle: 90° Bearing:		face RL: ords:	E 359529.1422 N 5783824.151
	В	orel	nole Ir	nform	nation				Field Materi	al De	scription	
000	SUPPORT	WATER	۲۲(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE ST NC ST	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT	03			1		J		1	FILL: Gravelly CLAY, low plasticity, dark brown moist.	1,		— вн13-0.1
			o	-1 -		J		CL	Silty CLAY: Medium plasticity, grey with orango mottle, slightly moist.	9		— вн13-1.0
				-2-		J						
		ZF0\$0		-3		J			END OF BOREHOLE AT 3.00 m			—— BH13-3.0



BH14

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			iviouritir iametei		Ezi-Pı 60 mn				Hole Angle: 90° Bearing:		urface o-ord:		L:	E	359515.0588 N 5783294.858
_	В	orel	nole Info	orm	ation				Field Mate	rial [Descr	ript	ion		
1	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	l	MOISTURE		RELATION NOIST		STRUCTURE AND ADDITIONAL OBSERVATIONS
T				-		J			TOPSOIL: Silty CLAY, low plasticity, dark broslightly moist.	wn,			П		— BH14-0.1
			0.50			J	222a	ML	SILT: Low plasticity, light brown, slightly mois	st. –		1	 - 		
		ZEC	0.70	-1		J		CL	Silty CLAY: Medium plasticity, dark grey with orange mottle, slightly moist.				 		—— BH14-1.0
		<u>E</u> \$0		-3 -			<u> </u>		END OF BOREHOLE AT 2.00 m					 	DR 14-2.U



BH15

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

-	B	orel	nole Infori	mation				Field Material Desc	crin	ntion	
		<u> </u>		lacion				i loid material Beec			
ODL I IIM	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	VS FB	RELATIVE DENSITY / CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
T				-	J			TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist.			—— ВН15-0.1
			0.50 —	-	J			SILT: Soft, grey, slightly moist.			——————————————————————————————————————
			a.90 — -1	-	J		CL	Silty CLAY: Medium plasticity, brown with orange mottle, slightly moist.			—— BH15-1.0
		N	1.50 —	_	J		CL	Orange-red clays.			P.145 2 0
		ZEO\$O	-3	-				END OF BOREHOLE AT 2.00 m			—— BH15-2.0



BH16

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Sodic/Dispersive Soils and ASS Assessment 20/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

3or	ehol	le D	iameter:	60 mn	n			Bearing: Co-ords: E 359423.6433 N 5782025.673
			nole Infor					Field Material Description
МЕТНОD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION RELATIVE DESCRIPTION WATERIAL FIELD DESCRIPTION RELATIVE DESCRIPTION STRUCTURE AND ADDITIONAL OBSERVATIONS SOUL SO THE STRUCTURE AND ADDITIONAL OBSERVATIONS
PT				-	J			TOPSOIL: Silty CLAY, low plasticity, dark brown, moist.
			o.so — -1		J		CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist. BH16-0.5 BH16-1.0
				-	3		CL	Yellow sand inclusions. High plasticity, grey.
			-2	-	J		CL	Dark clays. BH16-2.0
		o≶oπz	-3		J			END OF BOREHOLE AT 3.00 m



BH17 / MW01

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Project: Sodic/Dispersive Soils and ASS Assessment Date Completed: 21/5/21 Borehole Location: **Officer South Employment Precinct** Recorded By: EL PS124554 SG Project Number: Log Checked By:

Drill Model/Mounting: Ezi-Probe Driller: Matrix Surface RL: 0

	SUPPORT	3	Boreh	60 mm ole Infor		on 5				er Lic No:	Co-ords					N 5784108.668
										FIE	eld Mater	ial D	esc	ription		
	SUPPORT					5	6	7	8	9 10			11	12		13
PT		WATER	WEI CONSTRU	LL JCTION	RL(m)	DEPTH(m)	Field PID (ppm)	SAMPLE	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DE (SOIL NAME; plasticity/grain siz particle shape, secondary com minor constituents, moist relative density/consisten (ROCK NAME; grain size, colour, strength, minor constitue	escription ze, colour, ponents, ure, ncy) weathering, nts)	Field pH	MOISTURE	RELATIVE DENSITY /CONSISTENCY RELATIVE DENSITY /CONSISTENCY /CONSISTEN	ADDI	STRUCTURE AND TIONAL OBSERVATIONS
		W				0.40	<u> </u>	3	15)	TOPSOIL: Silty CLAY, low pladark brown, moist. Silty CLAY: Medium plasticity, orange mottle, slightly moist.	esticity,	Fie	MC		——BH1 — — — ——BH1 ——BH1	
TC						-2		J		High plasticity.					– ⊸BH1	7-2.0
TC						-3 -		J		Low plasticity.					DUF	7-3.0 109-210521 110-210521
						-4				Yellow-brown.						
						-4 -				Moist.						
						5.00 -5 -			<u>Z</u> 1	END OF BOREHOLE AT 5.00) m					



BH18

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

or	ehol				60 m				<u> </u>		ords		360050.1194 N 5783369.601
	В	orel	ole	nforn	nation				Field Materia	al Des	scr	iption	
MEIHOD	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY / CONSISTENCY BL S SLLS H	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT				0.30		J			TOPSOIL: Silty CLAY, low plasticity, dark brown moist. SAND: Medium, light brown, dry.				—— BH18-0.1 DUP01-210519 DUP02-210519
				-		J			, 3 , ,				—— BH18-0.5
				o.70 ————————————————————————————————————		J		CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.				—— BH18-1.0
				-2-		J		CL	High plasticity.				—— BH18-2.0
		z⊩φ≶o		•		J							—— BH18-3.0
\neg		W O		-3 -			ľ'		END OF BOREHOLE AT 3.00 m			11111	



BH19 / MW02

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Project: Sodic/Dispersive Soils and ASS Assessment Date Completed: 20/5/21 Borehole Location: **Officer South Employment Precinct** Recorded By: EL PS124554 SG Project Number: Log Checked By:

Drill Model/Mounting: Ezi-Probe Driller: Matrix Surface RL: 0

	el/Mounting: Ez Diameter: 60	zi-Probe) mm			ller: Matrix Surfac ller Lic No: Co-or			0 E 359997	.8344 N 5782922.794
		Information		$\overline{}$	Field Mat				
METHOD SUPPORT 5	3 4 WELL	5	Field PID (ppm) 9	SAMPLE 2 SAMPLE SAMPLE	9 10 SOIL/ROCK MATERIAL FIELD DESCRIPTIC (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering strength, minor constituents)	N	11		13 STRUCTURE AND ADDITIONAL OBSERVATION
HA		0.30	-	J //	TOPSOIL: Silty CLAY, low plasticity, dark brown, moist. SILT: Soft, grey, slightly moist.				BH19-0.1
DT.	Ш	0.80 —		J	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.	1			DUP05-210520 DUP06-210520 —BH19-1.0
PT		-2	- - -	J	High plasticity.				——ВН19-2.0
TC		-4	-	<u> </u>	Soft, light brown, moist. Wet.				——ВН19-3.0
		5.00 - 5	_		END OF BOREHOLE AT 5.00 m				



BH20

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Sodic/Dispersive Soils and ASS Assessment 20/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 SG Project Number: Log Checked By:

rill Model/Mounting:			Surface RL:	
orehole Diameter:	60 mm		Co-ords: E 359882.7917 N 5782179	.43
Borehole Inform	nation	Field Materia	Il Description	
SUPPORT WATER RL(m) DEPTH(m)	FIELD TEST SAMPLE GRAPHIC LOG USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	RELATIVE DENSITY / CONSISTENCY BUT OF CONSISTENCY STRUCTURE AND ADDITION OBSERVATIONS OBSERVATIONS SOUL 55 H	ONAL
-	,)))) TOPS	OIL: Silty CLAY, low plasticity, dark brown y moist.		
0.50	J SILT:	Soft, grey, slighly moist.	BH20-0.5	
-1 —	J CL Sility C brown	CLAY: Medium plasticity, yellow-grey with nottle, slightly moist.		
-2-	J CL High I	plasticity, sand inclusions.	BH20-2.0	
ZF3				



BH21 / MW03

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Project: Sodic/Dispersive Soils and ASS Assessment Date Completed: 20/5/21 Borehole Location: **Officer South Employment Precinct** Recorded By: EL SG Project Number: PS124554 Log Checked By:

Drill Model/Mounting: Ezi-Probe Driller: Matrix Surface RL: 0

Во	reh	ole	Diameter: 60 mm				Drille	er Lic No: Co-ords			E 359750.	6081 N 5781856.83
			Borehole Infor					Field Mater	ial C)esc	ription	
ЕТНОБ	SUPPORT		3 4 WELL CONSTRUCTION	RL(m) G	Field PID (ppm)	7 WALE	GRAPHIC LOG ∞	9 10 SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents moisture		11	12 RELATIVE DENSITY /CONSISTENCY BLANCE AND ADDRESS	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
SP Australia Pty Ltd. Version 5.1 ENVIRONMENTAL BOREHOLE/WELL LOG VPA PS124554 LOGS EL.GPJ YH2006.GDT 3/6/21		OLDO	CONSTRUCTION AND CONSTRUCTION AND CONSTRUCTION	-1	Held PII	C C SAMPLE	GRAPHI	relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents) TOPSOIL: Silty CLAY, low plasticity, dark brown, dry. Silty CLAY: Medium plasticity, grey, slightly moist. With orange mottle. High plasticity, soft, light brown.	Field pH	MOISTU	H S S S S S S S S S S S S S S S S S S S	——BH21-0.1 ——BH21-1.0 ——BH21-2.0 ——BH21-3.0

This borehole log should be read in conjunction with WSP's accompanying standard notes.



BH22

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting iameter		Ezi-Pr 60 mm				Hole Angle: 90° Bearing:	Sur Co-		RL: s: E	360721.3169 N 5784164.092
-			nole Info			•			Field Materi				
НОБ	SUPPORT			DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		3E	RELATIVE DENSITY / CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
☐ METHOD	SUP	WATER	RL(n	DEP	HEL	SAM	GRA	osn	TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist.	/n,	MOIS	8	—— BH22-0.1
			0.50 -	-		J		CL	Silty CLAY: Medium plasticity, brown with oran mottle, slightly moist.	 ge			——————————————————————————————————————
			-	1-		J							—— вн22-1.0
			1.50 -	-				CL	High plasiticity.				
		NEC		-		J							—— ВН22-2.0
) <u>%</u> 0		_					END OF BOREHOLE AT 2.00 m				
			-	3-									



BH23

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting: iameter:	60 mm			Hole Angle: Bearing:	90° Surfa			360627.8072 N 5783741.898
	В	orel	nole Inforr	nation			Fie	eld Material Des	scr	iption	
	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DE	SCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY RELATIVE DENSITY / CONSISTENCY RELATIVE DENSITY / CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT					J		TOPSOIL: Silty CLAY, low plasticit slightly moist.				—— BH23-0.1
			-1 -		J		Silty CLAY: Medium plasticity, grey mottle, slightly moist.	with yellow			—— BH23-0.5 —— BH23-1.0
		z⊪φ≶ο	-3-		J		END OF BOREHOLE AT 2.00 m				—— BH23-2.0



BH24

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting: iameter:	60 mm				Hole Angle: 90° Bearing:	Co-		eRL: s: E	360559.1119 N 5783217.915
_	В	orel	nole Infor	nation				Field Materi	al De	scr	iption	
)	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY / CONSISTENCY BLACK DENSITY / CONSISTENCY BLACK DENSITY / CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
T				-	J			TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist.	'n,			— BH24-0.1
			0.50 —		J			SILT: Soft, grey, slightly moist.				——————————————————————————————————————
			-1·	_	J		CL	Silty CLAY: Medium plasticity, brown-yellow, slightly moist.				—— BH24-1.0
		S#¢\$0	-2	-	J			END OF BOREHOLE AT 2.00 m				—— вн24-2.0
			-3·	-								



BH25

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting iameter:	60 mm					0-0		eRL: s: E	360319.7117 N 5782525.673
_	В	orel	nole Infor	mation				Field Material	Des	cr	iption	
OCT I	SUPPORT	WATER	RL(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY / CONSISTENCY RELATIVE DENSITY / CONSISTENCY RELATIVE DENSITY / CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
T		1		-	J			TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist.				—— BH25-0.1
			-1		J		CL	Silty CLAY: Low plasticity, grey-yellow, slightly moist, sand inclusions.	-			——————————————————————————————————————
		ZE	1.50 —		J			SAND: Medium, grey-yellow, slightly moist.				— — — — — — — — — — — — — — — — — — —
		<u>-</u> φ§Ο	-2	-				END OF BOREHOLE AT 2.00 m				



BH26

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Sodic/Dispersive Soils and ASS Assessment 20/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 SG Project Number: Log Checked By:

				Mounting: ameter:	60 mm					Surfa Co-o				L:		Ε	360446.7925 N 5782019.353
		Во	reh	ole Inforn	nation				Field Material	Des	cr	rip	ot	io	n		
METHOD	SUPPORT		WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	FB	:>	<u>ا</u> _!	TIVE SITY OM LSX	20	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT						J			TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist.								BH26-0.1
				0.50	-	J			SILT: Soft, light grey, slighly moist.				 - 	 - 	 		——————————————————————————————————————
			ZEC	-1-		J		CL	Silty CLAY: Medium plasticity, brown with yellow mottle, slightly moist.			┸	-			:	—— ВН26-1.0
			ĠWO	-3-			<u> </u>		END OF BOREHOLE AT 2.00 m								



BH27

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Sodic/Dispersive Soils and ASS Assessment 20/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting: iameter:	60 mm	De				rrac -ord	ceRL: ds: E :	360291.5757 N 5781365.247
_	В	orel	ole Inforn	nation				Field Material D	esc	ription	
МЕТНОБ	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY/ CONSISTENCY BH LS	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT					J			TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist.			— ВН27-0.1
			0.40	_	J		CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.			——————————————————————————————————————
			-1- - -		J						—— ВН27-1.0
		N	1.60	_	_			Clayey SAND: Medium, orange-grey, moist.	_		
		ΣΕΦ\$Ο	-3-		J			END OF BOREHOLE AT 2.00 m			BH27-2.0



BH28

SHEET 1 OF 1

VPA Client: Date Commenced: 24/5/21 Sodic/Dispersive Soils and ASS Assessment 24/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

Solution Signature Signa	or	eho				60 m				Bearing:	Co-			361345.5765 N 5783965.121
STRUCTURE AND ADDITIONAL DISSERVATIONS STRUCT		В	orel	ole	Inforn	nation				Field Mater	al De	scr	ription	
TOPSOL: Siliy CLAY, medium plasticity, dark brown, slightly moist, rootles. ———————————————————————————————————	WE I I O D	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	SRAPHIC LOG	JSC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	K K K K K K K K K K K K K K K K K K K	
BH28-0.5 CL. High plasticity, sand inclusions. CL. Very high plasticity.	T	0,	_					\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		TOPSOIL: Silty CLAY, medium plasticity, dark brown, slightly moist, rootlets.				—— вн28-0.1
CL High plasticity, sand inclusions. -2- J CL Very high plasticity.					0.20	-	J		CL	Silty CLAY: Medium plasticity, yellow-grey with brown mottle, slightly moist.	-			—— ВН28-0.5
-2- J					-1 - -		J		CL	High plasticity, sand inclusions.				—— вн28-1.0
					-2 -	_	J						iiiii	—— вн28-2.0
			N		-				CL	Very high plasticity.				
			ZF OS		-3		J	<u> </u>		END OF BOREHOLE AT 3.00 m				—— вн28-3.0



BH29

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			iamete		Ezi-Pr 60 mn				Hole Angle: 90° Bearing:	Surf			361100.8968 N 5783371.676
	В	orel	nole In	form	ation				Field Materi	al De	scr		
	SUPPORT	WATER	(L(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY/CONSISTENCY RELATIVE DENSITY/CONSISTENCY RATE OF CONSISTENCY RATE OF CONSISTENCY RATE OF CONSISTENCY RELATIVE DENSITY OF CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
T	S	8	2	<u> </u>	<u> </u>	J			TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist.	vn,	N	> ØL Ø > I	—— BH29-0.1
			a.	50 —		J		CL	Silty CLAY: Low plasticity, brown-yellow, dry.				——————————————————————————————————————
				-1-		J							—— ВН29-1.0
				-2 -		J							—— BH29-2.0
		ZHØ\$O	2.0	-		J			Silty SAND: Fine, orange-grey, moist.				— вн29-3.0
		ŏ		-3					END OF BOREHOLE AT 3.00 m				



BH30

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Sodic/Dispersive Soils and ASS Assessment 20/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 SG Project Number: Log Checked By:

oreh	ole l	Diameter:	60 mn	n		Hole Angle: 90° Bearing:	Co-ords: E 361014.7402 N 5782779.	2
E	Bore	ehole Info	rmation			Field Mater	rial Description	
METHOD	WATER	RL(m)	DEPTH(m)	SAMPLE	GRAPHIC LOG USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	RELATIVE DENSITY/ CONSISTENCY WAS DENSITY ON STRUCTURE AND ADDITION OBSERVATIONS OBSERVATIONS OBSERVATIONS	NAL
PT			-	J		TOPSOIL: Silty CLAY, low plasticity, dark broslightly moist.		
		0.50 —		J		SILT: Soft, grey, slightly moist.	BH30-0.5	_
		a.90 —	- - -	J	CL	Silty CLAY: Medium plasticity, grey with orang mottle, slightly moist.	ge	
		-2	_ 2 — _	J	CL	Increased silt, soft.	BH30-2.0	
	<u> </u>	2.50 —	-	J	CL	Sandy CLAY: Medium plasticity, grey with ora mottle, slightly moist.		_
	NF GWO	3	3			END OF BOREHOLE AT 3.00 m		



BH31

SHEET 1 OF 1

VPA Client: Date Commenced: 24/5/21 Sodic/Dispersive Soils and ASS Assessment 24/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 SG Project Number: Log Checked By:

			Mounting: iameter:	60 mm					ord	e RL: ls: E	360981.3322 N 5782000.728
	В	oreh	ole Inforr	nation				Field Material De	escr	ription	
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT					J			TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist, rootlets.			—— ВН31-0.1
			0.30		J		CL	Silty CLAY: Low plasticity, brown, dry.			—— BH31-0.5
			-1 -		J		CL	Medium plasticity, orange mottle.			—— BH31-1.0
							CL	High plasticity, light brown with orange mottle.			
		N E			J						— ВН31-2.0
		φ≶0	-3-					END OF BOREHOLE AT 2.00 m			



BH32

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Sodic/Dispersive Soils and ASS Assessment 20/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

			Mounting: iameter:	60 mn				Hole Angle: 90° Bearing:	Surfac Co-ord		360635.9936 N 5781345.355
010			ole Inforr		•			Field Materia			000000.0000 14 07 0 10 40.000
			1010 1111011	lation				i iola matoria	u. 5000		
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	ST MD STENCY RELATIVE DENSITY/ CONSISTENCY ST MD VST D VST D VST D H	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT					J			TOPSOIL: Silty CLAY, low plasticity, dark brown slightly moist.	'n,		— BH32-0.1
			0.50 —	_	J			SILT: Soft, pale grey, slightly moist.			——————————————————————————————————————
			a.90 —		J		CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist, sand inclusions.			—— BH32-1.0
		Z	-2-		J		CL	Firm, high plasticity.			—— BH32-2.0
\dashv		Z⊩0≷0	-3		J	\square		END OF BOREHOLE AT 3.00 m			—— BH32-3.0
		Ö									



BH33

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Sodic/Dispersive Soils and ASS Assessment 20/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 Log Checked By: SG Project Number:

	-1	eho		-1- 1	£e.	-4!-				P1 1187 4 1	-1 5		!4! - ·-	
STRUCTURE AND ADDROWN. STRUCTURE AND ADDROWN. STRUCTURE AND ADDROWN. BESSET AND TOPSOIL. Sity CLAY, low plasticity, dark brown. SILT: Soft, pale grey, dry. BH33-0.5 BH33-1.0 BH33-2.0		B	ore!	iole Ir	itorm	ation	П			Field Materi	ai De	scr	iption	
TOP-SOL: Silty CLAY, low plasticity, dark brown, slightly moist. SILT: Soft, pale grey, dry. SILT: Soft, pale grey, dry. BH33-0.1 BH33-0.5 BH33-1.0 BH33-2.0	ם סבו בואו	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	FB C V V V V V V V V V V V V V V V V V V V	OBSERVATIONS
SILT: Soft, pale grey, cry. SILT: Soft, pale grey, cry. BH33-0.5 BH33-1.0 BH33-1.0 Clayey SAND: Fine, yellow-grey, slighty moist.	Т				-					TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist.	/n,			
-1- J J BH33-1.0 -2- J J BH33-2.0 Clayey SAND: Fine, yellow-grey, slighty moist.				C	50		J	<u> </u>		SILT: Soft, pale grey, dry.			 	——————————————————————————————————————
2.50 — Clayey SAND: Fine, yellow-grey, slighty moist.				ć			J		CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.	9		11111	—— внзз-1.0
- Clayey SAND: Fine, yellow-grey, slignty moist.					-2-		J							—— внзз-2.0
				2						Clayey SAND: Fine, yellow-grey, slighty moist.				
			NF OS		-3 -		J	. ;/: . ; / · ;		END OF BOREHOLE AT 3.00 m			11111	—— BH33-3.0



BH34

SHEET 1 OF 1

VPA Client: Date Commenced: 24/5/21 Sodic/Dispersive Soils and ASS Assessment 24/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

J1 (eho R e	orek	nole Infor	60 mm				Bearing: Field Materi	al Do	scr	intion		
	ان	J1 61		III				i iciu iviateri	u. De	301			
ME I IOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATION OF THE PROPERTY OF TH		STRUCTURE AND ADDITIONAL OBSERVATIONS
T				_	J			TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist, rootlets.	n,				— BH34-0.1 — BH34-0.5
			0.60 —	_	J		CL	Silty CLAY: Medium plasticity, brown with oran mottle, slightly moist.	 ge			 	
			-1	-	J		CL	High plasticity, light grey with orange mottle, tr sand.	ace				—— BH34-1.0
			-2		J							İİ	—— внз4-2.0
		ZH.	2.80 —		J			Clayey SAND: Fine-medium, light grey with orange mottle, moist.				\Box	— ВН34-3.0
\exists		zμφ≷ο	-3					END OF BOREHOLE AT 3.00 m			111	ii	



BH35

SHEET 1 OF 1

VPA Client: Date Commenced: 24/5/21 Sodic/Dispersive Soils and ASS Assessment 24/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 SG Project Number: Log Checked By:

			Mounting: iameter:	60 mm	,DE			Hole Angle: 90° Surfa Bearing: Co-o			\L.	•	Ε	361405.9964 N 5781810.08
	В	oreh	ole Inforn	nation				Field Material Des	cr	ip	tic	n		
МЕТНОD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	FB	REL DEN ONSI	Ę.	VD	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT					J	\\\\ \\\\		TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist.						—— BH35-0.1
			0.20		J		CL	Silty CLAY: Low plasticity, light grey with orange mottle, slightly moist, sand inclusions.						—— ВН35-0.5
			-1- -	_	J		CL	Medium plasiticity, hard.						—— внз5-1.0
			-				CL	High plasticity.						
		N	-	-			CL	Sand inclusions, moist.				 		
_		zμφş	-2-		J	X_{\perp}		END OF BOREHOLE AT 2.00 m		щ				— BH35-2.0
)≶0	-3-											



BH36

SHEET 1 OF 1

VPA Client: Date Commenced: 24/5/21 Sodic/Dispersive Soils and ASS Assessment 24/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

7	В				nation				Field Material D	-30	Ipuon	
ODL III	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY/ CONSISTENCY BL SA CONSISTENCY RELATIVE DENSITY/ CONSISTENCY BL SA CONSISTENCY RELATIVE DENSITY AND A CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
т				-		J			TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist, rootlets.			—— внз6-0.1
				-		J		CL	Silty CLAY: Medium plasticity, dark brown, slightly moist.			—— ВН36-0.5
				-1- - -		J		CL	High plasiticity, light brown with orange mottle.			—— BH36-1.0
				-2 - -		J		CL	Sand inclusions.			—— ВН36-2.0
		ZF0\$0		- 3-		J			END OF BOREHOLE AT 3.00 m			—— ВН36-3.0



BH37

SHEET 1 OF 1

VPA Client: Date Commenced: 24/5/21 Sodic/Dispersive Soils and ASS Assessment 24/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

	~h~	ام ا	iameter:	60 mm	obe			Hole Angle: 90° Bearing:	Surfa Co-c			361468.4953 N 5782903.018
501			ole Inforn		1			Field Materi				30 1400.4933 N 37 02903.010
	В	orei	iole illiorii	lation				rieiu iviateri	ai Des	SCI		
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	RELATIVE DENSITY/ CONSISTENCY ALS SAUGH	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT		-			J	????		TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist, rootlets.				—— BH37-0.1
			a.10 ——		J		CL	Silty CLAY: Low plasticity, grey with orange mottle, dry.				—— BH37-0.5
			-1-		J		CL	Medium plasticity.				—— внз7-1.0
			-				CL	Light grey with orange mottle, high plasticity.				
			-2- -		J							—— внз7-2.0
		2μψ≷0	- - - -3-	-	J							—— внз7-3.0
		W	-3-				I	END OF BOREHOLE AT 3.00 m			11111	



BH38

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

STRUCTURE AND ADDITIONAL STRUCTURE AND ADDIT				Mountinզ iameter:		60 mn				Hole Angle: 90° Bearing:	Surf Co-			360239.5776 N 5784549.414
STRUCTURE AND ADDITIONAL DISTRICT ON THE PROPERTY OF THE PROPE		Во	reh	ole Info	rm	ation				Field Materi	al De	scr	iption	
FILE: Sity CLAY, medium plasticity, light brown, moist, granific gravels. ———————————————————————————————————	שוביים מיים	SUPPORT	WATER	3L(m)	DEPTH(m)	FIELD TEST	SAMPLE	SRAPHIC LOG	JSC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	8778 800 800 800	STRUCTURE AND ADDITIONAL OBSERVATIONS
BH38-1.0 CL High plasticity. -2- J BH38-2.0	PT		_		-				1	FILL: Silty CLAY, medium plasticity, light brow moist, granitic gravels.	n,			—— BH38-0.1
-2- J H38-2.0									CL	Silty CLAY: Medium plasticity, dark grey with orange mottle, slightly moist.				
				-	2-		J		CL	High plasticity.				—— BH38-2.0
			N F G	_	3		J			TAID OF BODELIOLE AT A GO			11111	—— BH38-3.0



BH39

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

	Diameter:	Ezi-Probe 60 mm		Hole Angle: 90° Surface RL: Bearing: Co-ords: E 359195.1147 N 5784741.668
	hole Inforn			Field Material Description
METHOD SUPPORT WATER	RL(m) DEPTH(m)	FIELD TEST	GRAPHIC LOG USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION SOIL/ROCK MATERIAL FIELD DESCRIPTION STRUCTURE AND ADDITIONAL OBSERVATIONS STRUCTURE AND ADDITIONAL OBSERVATIONS
PT	-	J		TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist. TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist. TOPSOIL: SILTY TOPSOIL
	-	J	CL	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist. BH39-0.5
	-1-	J		BH39-1.0
ZEOSO	-3-			END OF BOREHOLE AT 2.00 m



BH40

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 Log Checked By: SG Project Number:

rehole Diameter:	60 mm		Bearing:			E 357624.402 N 5784214.317
Borehole Inforr	nation		Fie	eld Material De	escription	
SUPPORT WATER RL(m) DEPTH(m)	FIELD TEST	GRAPHIC LOG USC SYMBOL USC SYMBOL	ICK MATERIAL FIELD DE	SCRIPTION	MOISTURE STANDARD CONSISTENCE	STRUCTURE AND ADDITIONAL OBSERVATIONS
0.20	J	TOPSOIL: Cl	layey SAND, fine, dark Medium plasticity, grey			
	J					
-1-	J					BH40-1.0
1.70 —		Clayey SANI	D: Medium, grey with c	range mottle,		
-2-	J	moist.				
N F S	J	. / /				



BH41

SHEET 1 OF 1

VPA Client: Date Commenced: 19/5/21 Sodic/Dispersive Soils and ASS Assessment 19/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 Log Checked By: SG Project Number:

		iameter:	60 mn				Bearing: Co	-ord		357770.3869 N 5784609.543
Boi	reh	ole Inforn	nation				Field Material D	escr	ription	
SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY RELATIVE DENSITY/ CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
T		-		J			TOPSOIL: Clayey SAND, fine, dark brown, moist, rootlets.			—— BH41-0.1
		0.50	-	J		CL	Silty CLAY: Medium plasticity, light brown, moist.			——————————————————————————————————————
		-1- - - -		J						—— BH41-1.0
		-2 - - -		J			Clayey SAND: Fine-medium, yellow-brown, moist.			—— BH41-2.0
	ZF OSO			J	/ · · · / · · · / ·		END OF BOREHOLE AT 3.00 m			—— вн41-3.0



BH42

SHEET 1 OF 1

VPA Client: Date Commenced: 24/5/21 Project: Sodic/Dispersive Soils and ASS Assessment 24/5/21 Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

OOI	rehole Diameter: Borehole Inform				60 mi	m			Bearing:	Co-					Ε	361239.608 N 5780622.991
	В	oreh	ole In	form	ation	T			Field Mater	ial De	scr	ipt	tio	n	7	
METHOD	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	FB	ر د ۲	ATIVE SITY/STEN	2	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT				-		J			TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist, rootlets.						Ι	—— ВН42-0.1
			a.	30		J		CL	Silty CLAY: Medium plasticity, light grey with orange mottle, slightly moist, trace sand.				+		· 	—— BH42-0.5
				-1-		J										—— ВН42-1.0
				-2-		J		CL	High plasiticity.							—— BH42-2.0
		z⊩φ≷o					1/1	l 1						ii		



SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 Log Checked By: SG Project Number:

Drill Model/Mounting: Ezi-Probe Hole Angle: 90° Surface RL:

	hol	le D	iameter:	60 mm			Bearing: Co-ords: E 358094.2572 N 5783190.885
	Вс	oreh	nole Inforr	nation			Field Material Description
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DESCRIPTION SOIL/ROCK MATERIAL FIELD DESCRIPTION SOIL/ROCK MATERIAL FIELD DESCRIPTION STRUCTURE AND ADDITIONAL OBSERVATIONS SOLUTION STRUCTURE AND ADDITIONAL OBSERVATIONS
PT	0)	۸		-	J		TOPSOIL: Silty CLAY, low plasticity, dark brown, slightly moist, rootlets.
			0.50	_	J		Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist. BH43-0.5
			-1-	_	J		BH43-1.0
			-2 -		J		High plasiticity. High plasitic
		Zμφ <u>\$</u> Ο	-3		J		END OF BOREHOLE AT 3.00 m



BH44

SHEET 1 OF 1

VPA Client: Date Commenced: 24/5/21 Project: Sodic/Dispersive Soils and ASS Assessment 24/5/21 Date Completed: Borehole Location: **Officer South Employment Precinct** EL Recorded By: PS124554 Log Checked By: SG Project Number:

Drill Model/Mounting: **Ezi-Probe** Hole Angle: **90°** Surface RL:

rill I ore	hol	e D	iameter:	60 mm			Hole Angle: 90° Bearing:	Co-d					Ε	361733.9224 N 5781886.937
$\overline{}$	В	oreh	ole Infori	mation			Field Materia	al De	scr	ip	tic	n	-	
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION		MOISTURE	E :	7_	ATIVE ISITY ISTEM	2	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT			0.10		J	CL	TOPSOIL: Silty CLAY, low plasticity, dark brow slightly moist, rootlets. Silty CLAY: Low plasticity, dark grey with orang mottle, slightly moist.			1 .				BH44-0.1
				-	J									—— BH44-0.5
			-1	-	J	CL	High plasiticity, light grey with mottle.							—— BH44-1.0
			-2·	-	J									—— ВН44-2.0
		z⊩φ≷o	-3		J		END OF BOREHOLE AT 3.00 m							—— вн44-3.0
		Ŏ					END OF BOREHOLE AT 3.00 m							



BH45

SHEET 1 OF 1

VPA Client: Date Commenced: 21/5/21 Sodic/Dispersive Soils and ASS Assessment 21/5/21 Project: Date Completed: **Officer South Employment Precinct** EL Borehole Location: Recorded By: PS124554 Log Checked By: SG Project Number:

Drill Model/Mounting: **Ezi-Probe**Hole Angle: **90°**Surface RL:

OBSERVAT MOISTURE MOISTURE MOISTURE MOISTURE MOISTURE MATERIAL MATERIAL OBSERVATION OBSE	7.9089 N 5784420.09	361017.9089				ords	Co-	Hole Angle: 90° Bearing:				60 mm	meter:			or
STRUCTURE AND OBSERVAT SITURD STRUCTURE AND OBSERVAT SITURD STRUCTURE AND OBSERVAT SITURD STRUCTURE AND OBSERVAT TOPSOIL: Sity CLAY: low plasticity, dark brown, slightly moist. TOPSOIL: Sity CLAY: Low plasticity, brown with orange CL Sity CLAY: Low plasticity, brown with orange CL Medium plasticity. CL High plasticity. CL High plasticity.				on	ptic	scr	ial De	Field Mater			\dashv	ation	le Inform	eho	Вс	
TOPSOIL: Silty CLAY: Low plasticity, dark brown, slightly moist. rootets. CL Silty CLAY: Low plasticity, brown with orange mottle, slightly moist. CL Medium plasticity. BH45-0.5 BH45-1.0 BH45-2.0	STRUCTURE AND ADDITIONA OBSERVATIONS	STRUCTU OE	Δ Δ	JM O	77_	MOISTURE		SOIL/ROCK MATERIAL FIELD DESCRIPTION	JOMN SOIL/RO	GRAPHIC LOG USC SYMBOL	SAMPLE	FIELD TEST	DEPTH(m)	WAIEK	SUPPORT	טטחושא
The state of the s	l45-0.1	— BH45-0.1	 	 	 		wn,	TOPSOIL: Silty CLAY, low plasticity, dark broadlightly moist, rootlets.	TOPSOIL: Si							PT
-2 - J		——————————————————————————————————————						Silty CLAY: Low plasticity, brown with orange mottle, slightly moist.	Silty CLAY: L mottle, slight	CL	J	-	0.20			
-2- J J J J J J J J J J J J J J J J J J	l 45-1 .0	—— ВН45-1.0						Medium plasticity.	CL Medium plas	CL	J	_	-1 <i>-</i>			
	145-2.0	—— ВН45-2.0			i i I I			High plasiticity.	CL High plasitici	CL	J		-2-			
								Wet.	CL Wet.	CL			- - -	> -		
3 J J BH45-3.0	45-3.0	BH45-3.0	Щ	\bot	44			END OF BODELIOI E AT 2 00	END OF BOI	<u> </u>	J		- 3	_		



BH17 / MW01

SHEET 1 OF 1

Client: VPA Date Commenced: 21/5/21 Project: Sodic/Dispersive Soils and ASS Assessment Date Completed: 21/5/21 Borehole Location: **Officer South Employment Precinct** Recorded By: EL PS124554 SG Project Number: Log Checked By:

Drill Model/Mounting: Ezi-Probe Driller: Matrix Surface RL: 0

Driii iviodei/iv Borehole Dia	Mounting: Ezi-Pro ameter: 60 mm			Drille Drille	er: Matrix Surface er Lic No: Co-ords			0 E 360169.	2921 N 5784108.668
	Borehole Infor				Field Mater				
2 3	WELL CONSTRUCTION		Field PID (ppm) 9	GRAPHIC LOG ∞	9 10 SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	_	URE URE	RELATIVE DENSITY /CONSISTENCY	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
METHOD SUPPORT WATER		RL(m) DEPTH(m)	Field PID	GRAP	(ROCK NAME; grain size, colour, weathering, strength, minor constituents) TOPSOIL: Silty CLAY, low plasticity, dark brown, moist.	Field pH	MOISTURE	VS	—BH17-0.1
		0.40 —	J		Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.	-			— — — — — — — — — — — — — — — — — — —
		-1 -	J						——ВН17-1.0
		-2-	J		High plasticity.				——ВН17-2.0
ΓC		-3-	J		Low plasticity.				—BH17-3.0 DUP09-210521 DUP10-210521
		-4-			Yellow-brown. Moist.				
		5.00-5				-			
1 1		J.505-3		ı		1			



BH19 / MW02

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Project: Sodic/Dispersive Soils and ASS Assessment Date Completed: 20/5/21 Borehole Location: **Officer South Employment Precinct** Recorded By: EL PS124554 SG Project Number: Log Checked By:

Drill Model/Mounting: Ezi-Probe Driller: Matrix Surface RL: 0

	el/Mounting: Ez Diameter: 60	zi-Probe) mm			ller: Matrix Surfac ller Lic No: Co-or			0 E 359997	.8344 N 5782922.794
		Information		$\overline{}$	Field Mat				
METHOD SUPPORT 5	3 4 WELL	5	Field PID (ppm) 9	SAMPLE 2 SAMPLE	9 10 SOIL/ROCK MATERIAL FIELD DESCRIPTIC (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering strength, minor constituents)	N	11		13 STRUCTURE AND ADDITIONAL OBSERVATION
HA		0.30	-	J //	TOPSOIL: Silty CLAY, low plasticity, dark brown, moist. SILT: Soft, grey, slightly moist.				BH19-0.1
DT.	Ш	0.80 —		J	Silty CLAY: Medium plasticity, grey with orange mottle, slightly moist.	1			DUP05-210520 DUP06-210520 —BH19-1.0
PT		-2	- -	J	High plasticity.				——ВН19-2.0
TC		-4	-	<u> </u>	Soft, light brown, moist. Wet.				——ВН19-3.0
		5.00 - 5	_		END OF BOREHOLE AT 5.00 m				



BH21 / MW03

SHEET 1 OF 1

VPA Client: Date Commenced: 20/5/21 Project: Sodic/Dispersive Soils and ASS Assessment Date Completed: 20/5/21 Borehole Location: **Officer South Employment Precinct** Recorded By: EL SG Project Number: PS124554 Log Checked By:

Drill Model/Mounting: Ezi-Probe Driller: Matrix Surface RL: 0

			Diameter: 60 mm				Drille	r Lic No: Co-ords			u E 359750.	6081 N 5781856.83
Г			Borehole Infor	mation				Field Mater	ial D			
	2	3	4	5	6	7	8	9 10		11	12	13
Т МЕТНОВ	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	Field PID (ppm)	SAMPLE	GRAPHIC LOG	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	Field pH	MOISTURE	RELATIVE DENSITY /CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
NSP Australia Pty Ltd. Version 5.1 ENVIRONMENTAL BOREHOLE/WELL LOG VPA PS124554 LOGS EL.GPJ YH2006.GDJ 3/6/21		WA WA		-1	Tie Tie	ASS J J	800000000000000000000000000000000000000	TOPSOIL: Silty CLAY, low plasticity, dark brown, dry. Silty CLAY: Medium plasticity, grey, slightly moist. With orange mottle. High plasticity, soft, light brown.	Field	OW	8 subsection	——BH21-0.1 ——BH21-0.5-———————————————————————————————————

This borehole log should be read in conjunction with WSP's accompanying standard notes.

Printed on: 19 May 2021 11:08:59 am

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under Section 67 of the Water Act 1989

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Water used under this licence is not fit for any use that may involve human consumption, directly or indirectly, without first being properly treated.

This licence is not to be interpreted as an endorsement of the design and/or construction of any works (including dams). The Authority does not accept any responsibility or liability for any suits or actions arising from injury, loss, damage or death to person or property which may arise from the maintenance, existence or use of the works.

Each person named as a licence holder is responsible for ensuring all the conditions of this licence are complied with.

This licence authorises its holders to construct the described works, subject to the conditions.

Licence Holder(s)

VICTORIAN PLANNING AUTHORITY of LEVEL 25 35 COLLINS STREET MELBOURNE VIC 3000 $\,$

Licence Contact Details

VICTORIAN PLANNING LEVEL 25 35 COLLINS STREET AUTHORITY MELBOURNE VIC 3000

Licence Details

Expiry date 19 May 2022

Status Active

Authority Southern Rural Water

Name of waterway or aquifer NA for construct/decommission

Water system Koo Wee Rup (GMU)

Summary of Licensed Works

The details in this section are a summary only. They are subject to the conditions specified in this licence.

Works ID Works type Use of water WRK126701 Bore Observation

Description of Licensed Works

WORKS ID WRK126701

Copy of Record

Printed on: 19 May 2021 11:08:59 am Works Licence ID:WLE081029 Page 1 of 4

Works type Bore

Works subtype Drilled bore
Proposed maximum depth 50.000 metres

Works location

 Easting
 Northing
 Zone MGA

 359991.672
 5782811.336
 Zone 55

Land description

Volume 7721 Folio 063 Lot 1 of Plan TP128503W

Property address

345 OFFICER SOUTH ROAD, OFFICER SOUTH, VIC 3809

Related Instruments

Related entitlements Nil **Related water-use entities** Nil

Application History

Reference Type Status Lodged date Approved date Recorded date

WLI614932 Issue Approved 19 May 2021 19 May 2021

Conditions

Licence WLE081029 is subject to the following conditions:

Siting and construction

- 1 The bore(s) must be drilled at the location specified in the application approved by the Authority.
- 2 If after drilling the bore is considered unsatisfactory a replacement bore may be drilled on the land specified in the licence.

Preventing pollution

- 3 All earthworks must be carried out, and all drilling fluids and waters produced during construction and development must be disposed of, in ways that avoid contaminating native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.
- 4 Construction must stop immediately if the Authority reasonably believes that fuel, lubricant, drilling fluid, soil or water produced during construction and development is at risk of being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.
- 5 The licence holder must construct and maintain bund walls, in accordance with the timeframe, specifications, guidelines or standards prescribed by the Authority, to prevent fuel, lubricant, drilling fluid, soil or water produced during construction and development from being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

Drilling licence and supervision requirements

- 6 The bore(s) must be constructed by, or under the direct supervision of, a driller licensed under the Water Act 1989 and endorsed as a Class 1, 2, or 3 driller, with appropriate endorsements.
- 7 If artesian pressure is expected or encountered, then a driller licensed under the Water Act 1989, and endorsed as a class 3 driller, must install casing in the bore(s) to a suitable depth, and in a suitable manner, to prevent its outbreak. A suitable valve must also be fitted to the bore.

Bore completion report

8 A Bore Completion Report must be submitted to the Authority within 28 working days of the bore(s) being completed.

Protecting water resources

- 9 No more than 1 bore(s) may be brought to final development under this licence.
- 10 At the completion of drilling and before the drilling rig leaves the site, all but 1 bore(s) must be decommissioned so as to eliminate physical hazards, conserve aquifer yield, prevent groundwater contamination and prevent the intermingling of desirable and undesirable waters.
- 11 The bore(s) must be located at least 30 metres from any authority's channel, reserve or easement unless authorised by the Authority.

Protecting water quality

- 12 Drilling must not exceed the maximum depth.
- 13 The bore(s) must be constructed so as to prevent aquifer contamination caused by vertical flow outside the casing.
- 14 If two or more aquifers are encountered, the bore(s) must be constructed to ensure that an impervious seal is made and maintained between each aquifer to prevent aquifer connection through vertical flow outside the casing; under no circumstances are two or more aquifers to be screened within the one bore or in any other manner to allow connection between them.
- 15 Boreheads must be constructed, to ensure that no flood water, surface runoff or potential subsurface contaminated soakage can enter the bore or bore annulus.

Protecting other water users

16 The diameter of the drill casing must not exceed 130 millimetres.

17 The bore(s) must be constructed so that water levels in the bore(s) can be measured by an airline, a piezometer or a method approved in writing by the Authority.

Fees and charges

18 The licence holder must, when requested by the Authority, pay all fees, costs and other charges under the Water Act 1989 in respect of this licence.

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Each person named as a licence holder is responsible for ensuring all the conditions of this licence are complied with.

This licence authorises its holders to construct the described works, subject to the conditions.

Licence Holder(s)

VICTORIAN PLANNING AUTHORITY of LEVEL 25 35 COLLINS STREET MELBOURNE VIC 3000 $\,$

Licence Contact Details

VICTORIAN PLANNING LEVEL 25 35 COLLINS STREET AUTHORITY MELBOURNE VIC 3000

Licence Details

Expiry date 19 May 2022

Status Active

Authority Southern Rural Water

Name of waterway or aquifer NA for construct/decommission

Water system Koo Wee Rup (GMU)

Summary of Licensed Works

The details in this section are a summary only. They are subject to the conditions specified in this licence.

Works ID Works type Use of water WRK126702 Bore Observation

Description of Licensed Works

WORKS ID WRK126702

Copy of Record

Printed on: 19 May 2021 11:19:17 am Works Licence ID:WLE081030 Page 1 of 4

Works type Bore

Works subtype Drilled bore
Proposed maximum depth 50.000 metres

Works location

 Easting
 Northing
 Zone MGA

 359757.243
 5781851.271
 Zone 55

Land description

Volume 8695 Folio 978 Lot 1 of Plan TP370056R

Property address

OFFICER SOUTH ROAD, OFFICER SOUTH, VIC 3809

Related Instruments

Related entitlements Nil **Related water-use entities** Nil

Application History

Reference Type Status Lodged date Approved date Recorded date

WLI614933 Issue Approved 19 May 2021 19 May 2021

Conditions

Licence WLE081030 is subject to the following conditions:

Siting and construction

- 1 The bore(s) must be drilled at the location specified in the application approved by the Authority.
- 2 If after drilling the bore is considered unsatisfactory a replacement bore may be drilled on the land specified in the licence.

Preventing pollution

- 3 All earthworks must be carried out, and all drilling fluids and waters produced during construction and development must be disposed of, in ways that avoid contaminating native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.
- 4 Construction must stop immediately if the Authority reasonably believes that fuel, lubricant, drilling fluid, soil or water produced during construction and development is at risk of being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.
- 5 The licence holder must construct and maintain bund walls, in accordance with the timeframe, specifications, guidelines or standards prescribed by the Authority, to prevent fuel, lubricant, drilling fluid, soil or water produced during construction and development from being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

Drilling licence and supervision requirements

- The bore(s) must be constructed by, or under the direct supervision of, a driller licensed under the Water Act 1989 and endorsed as a Class 1, 2, or 3 driller, with appropriate endorsements.
- 7 If artesian pressure is expected or encountered, then a driller licensed under the Water Act 1989, and endorsed as a class 3 driller, must install casing in the bore(s) to a suitable depth, and in a suitable manner, to prevent its outbreak. A suitable valve must also be fitted to the bore.

Bore completion report

8 A Bore Completion Report must be submitted to the Authority within 28 working days of the bore(s) being completed.

Protecting water resources

- 9 No more than 1 bore(s) may be brought to final development under this licence.
- 10 At the completion of drilling and before the drilling rig leaves the site, all but 1 bore(s) must be decommissioned so as to eliminate physical hazards, conserve aquifer yield, prevent groundwater contamination and prevent the intermingling of desirable and undesirable waters.
- 11 The bore(s) must be located at least 30 metres from any authority's channel, reserve or easement unless authorised by the Authority.

Protecting water quality

- 12 Drilling must not exceed the maximum depth.
- 13 The bore(s) must be constructed so as to prevent aquifer contamination caused by vertical flow outside the casing.
- 14 If two or more aquifers are encountered, the bore(s) must be constructed to ensure that an impervious seal is made and maintained between each aquifer to prevent aquifer connection through vertical flow outside the casing; under no circumstances are two or more aquifers to be screened within the one bore or in any other manner to allow connection between them.
- 15 Boreheads must be constructed, to ensure that no flood water, surface runoff or potential subsurface contaminated soakage can enter the bore or bore annulus.

Protecting other water users

16 The diameter of the drill casing must not exceed 130 millimetres.

17 The bore(s) must be constructed so that water levels in the bore(s) can be measured by an airline, a piezometer or a method approved in writing by the Authority.

Fees and charges

18 The licence holder must, when requested by the Authority, pay all fees, costs and other charges under the Water Act 1989 in respect of this licence.

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WLE081038

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This licence authorises its holders to construct the described works, subject to the conditions.

Licence Holder(s)

VICTORIAN PLANNING AUTHORITY of LEVEL 25 35 COLLINS STREET MELBOURNE VIC 3000 $\,$

Licence Contact Details

VICTORIAN PLANNING LEVEL 25 35 COLLINS STREET AUTHORITY MELBOURNE VIC 3000

Licence Details

Authority

Expiry date 20 May 2022

Status Active

Name of waterway or aquifer

NA for construct/decommission

Water system Koo Wee Rup (GMU)

Summary of Licensed Works

The details in this section are a summary only. They are subject to the conditions specified in this licence.

Southern Rural Water

Works ID Works type Use of water WRK126721 Bore Observation

Description of Licensed Works

WORKS ID WRK126721

Copy of Record

Printed on: 20 May 2021 1:58:33 pm Works Licence ID:WLE081038 Page 1 of 4

Works type Bore

Works subtype Drilled bore
Proposed maximum depth 50.000 metres

Works location

 Easting
 Northing
 Zone MGA

 360158.127
 5784096.959
 Zone 55

Land description

Volume 10276 Folio 986 CA 20 Parish of Pakenham

Property address

185 OFFICER SOUTH ROAD, OFFICER, VIC 3809

Related Instruments

Related entitlements Nil **Related water-use entities** Nil

Application History

Reference Type Status Lodged date Approved date Recorded date

WLI614939 Issue Approved 20 May 2021 20 May 2021

Conditions

Licence WLE081038 is subject to the following conditions:

Siting and construction

- 1 The bore(s) must be drilled at the location specified in the application approved by the Authority.
- 2 If after drilling the bore is considered unsatisfactory a replacement bore may be drilled on the land specified in the licence.

Preventing pollution

- 3 All earthworks must be carried out, and all drilling fluids and waters produced during construction and development must be disposed of, in ways that avoid contaminating native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.
- 4 Construction must stop immediately if the Authority reasonably believes that fuel, lubricant, drilling fluid, soil or water produced during construction and development is at risk of being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.
- 5 The licence holder must construct and maintain bund walls, in accordance with the timeframe, specifications, guidelines or standards prescribed by the Authority, to prevent fuel, lubricant, drilling fluid, soil or water produced during construction and development from being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

Drilling licence and supervision requirements

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- 7 If artesian pressure is expected or encountered, then a driller licensed under the Water Act 1989, and endorsed as a class 3 driller, must install casing in the bore(s) to a suitable depth, and in a suitable manner, to prevent its outbreak. A suitable valve must also be fitted to the bore.

Bore completion report

8 A Bore Completion Report must be submitted to the Authority within 28 working days of the bore(s) being completed.

Protecting water resources

- 9 No more than 1 bore(s) may be brought to final development under this licence.
- 10 At the completion of drilling and before the drilling rig leaves the site, all but 1 bore(s) must be decommissioned so as to eliminate physical hazards, conserve aquifer yield, prevent groundwater contamination and prevent the intermingling of desirable and undesirable waters.
- 11 The bore(s) must be located at least 30 metres from any authority's channel, reserve or easement unless authorised by the Authority.

Protecting water quality

- 12 Drilling must not exceed the maximum depth.
- 13 The bore(s) must be constructed so as to prevent aquifer contamination caused by vertical flow outside the casing.
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Protecting other water users

16 The diameter of the drill casing must not exceed 130 millimetres.

17 The bore(s) must be constructed so that water levels in the bore(s) can be measured by an airline, a piezometer or a method approved in writing by the Authority.

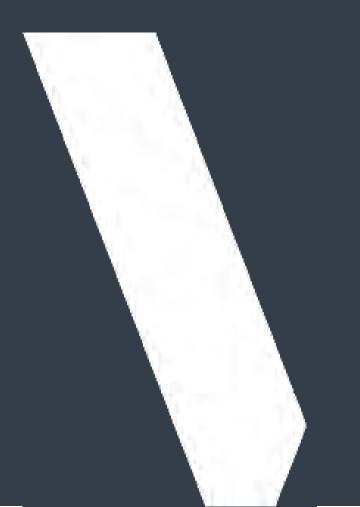
Fees and charges

18 The licence holder must, when requested by the Authority, pay all fees, costs and other charges under the Water Act 1989 in respect of this licence.

END OF COPY OF RECORD

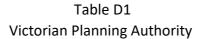
APPENDIX D

RESULTS TABLES





									Acid Sulphate	e Soils - Field				Analys	sis Selection Process Comment
								¥							
								pH-F (Field pH test)*	рН Бох	ΔpH (calculated)	Reaction Rate	Select for ASS analysis?	Soil profile	High organic surface	
FOL								pH Unit	pH Unit	pH Unit	<u> </u>	<u> </u>	<u> </u>	1	<u> </u>
EQL					DACC may be pr	sont further as	saccment is required	0.1	0.1	0.1 > 2.0	≥2	<u> </u>	(see notes)	<u> </u>	<u> </u>
							sessment is required e likely to be presen		3.0 and < 5.0 ≤ 3.0	> 2.0	≥ 2		(see notes)		
							, and a second					J <u></u>		<u> </u>	
Site ID	Location Code	Depth Avg	Field ID	Sample Code	Date	X Coord	Y Coord								
Officer South	BH01	0.1	BH01-0.1	EM2109285001	19/05/2021	358083	5785134	5.7	3.5	2.2	2		B-sd-n-0.4		
Officer South	BH01	0.5	BH01-0.5	EM2109285002	19/05/2021	358083	5785134	6.5	4.9	1.6	1		B-sd-n-0.4		
Officer South Officer South	BH01 BH01	1	BH01-1.0 BH01-2.0	EM2109285003 EM2109285004	19/05/2021	358083	5785134 5785134	6.8 6.6	5.0	1.8	1		B-sd-n-0.4 B-sd-n-0.4		
Officer South	BH01	3	BH01-3.0	EM2109285005	19/05/2021 19/05/2021	358083 358083	5785134	7.0	4.8 5.3	1.8 1.7	2		B-sd-n-0.4 B-sd-n-0.4		
1	BIIOI		51101 3.0	ENIZIOSZOSOOS	15/05/2021	330003	3703134	7.0	3.3	1.7			D 30 11 0.4		
Officer South	BH03	0.1	BH03-0.1	EM2109498010	21/05/2021	358013	5783811	6.2	2.3	3.9	3	х	B-cl-n-0.4	X	Typical decreasing acidity with depth
Officer South	ВН03	0.1	DUP07-210521	EM2109498015	21/05/2021	358013	5783811	6.2	3.0	3.2	3	Х	B-cl-n-0.4		
Officer South	BH03	0.1	DUP08-210521	M21-My47278	21/05/2021	358013	5783811	6.9	2.5	4.4	3	Х	B-cl-n-0.4		
Officer South	BH03	0.5	BH03-0.5	EM2109498011	21/05/2021	358013	5783811	6.2	4.3	1.9	2		B-cl-n-0.4	_	
Officer South Officer South	BH03 BH03	2	BH03-1.0 BH03-2.0	EM2109498012 EM2109498013	21/05/2021 21/05/2021	358013 358013	5783811 5783811	7.2 7.8	5.5 5.8	1.7 2.0	2		B-cl-n-0.4 B-cl-n-0.4	_	
Officer South	BH03	3	BH03-3.0	EM2109498014	21/05/2021	358013	5783811	7.8	8.0	-0.2	4		B-cl-n-0.4		
1					, , , ,			_		-					
Officer South	BH11	0.1	BH11-0.1	EM2109498001	21/05/2021	358872	5782470	5.4	2.8	2.6	3	Х	B-sd-n-0.4	Х	Organic layer at 1m. Only red zone below surface
Officer South	BH11	0.5	BH11-0.5	EM2109498002	21/05/2021	358872	5782470	5.2	3.5	1.7	2	х	B-sd-n-0.4		
Officer South	BH11	1	BH11-1.0	EM2109498003	21/05/2021	358872	5782470	5.2	2.8	2.4	3	Х	B-sd-n-0.4		
Officer South Officer South	BH11 BH11	2	BH11-2.0 BH11-3.0	EM2109498004 EM2109498005	21/05/2021 21/05/2021	358872 358872	5782470 5782470	5.7 8.0	3.6 5.8	2.1	2	X	B-sd-n-0.4 B-sd-n-0.4		
1	PULL	3	БП11-3.0	EIVI2103438003	21/03/2021	338872	3782470	8.0	3.0	2.2	1	^	B-30-11-0.4		
Officer South	BH17	0.1	BH17-0.1	EM2109498016	21/05/2021	360169	5784109	5.6	2.7	2.9	3		G-cl-n-0.4	Х	
Officer South	BH17	0.5	BH17-0.5	EM2109498017	21/05/2021	360169	5784109	6.6	4.3	2.3	3		G-cl-n-0.4		
Officer South	BH17	1	BH17-1.0	EM2109498018	21/05/2021	360169	5784109	6.1	4.3	1.8	3		G-cl-n-0.4		
Officer South	BH17	2	BH17-2.0	EM2109498019	21/05/2021	360169	5784109	6.4	4.6	1.8	2		G-cl-n-0.4		
Officer South Officer South	BH17 BH17	3	BH17-3.0 DUP09-210521	EM2109498020 EM2109498021	21/05/2021 21/05/2021	360169 360169	5784109 5784109	6.2 6.7	4.2	2.0 1.8	3		G-cl-n-0.4 G-cl-n-0.4	-	
Officer South	BH17	3	DUP10-210521	M21-My47279	21/05/2021	360169	5784109	5.8	5.0	0.8	2		G-cl-n-0.4	_	
1	D1127		00110110311	INEE INVALES	21,03,2021	500203	3764263	3.0	3.0	0.0			0 0 11 0.1		
Officer South	BH18	0.1	BH18-0.1	EM2109285042	19/05/2021	360059	5783352	5.4	3.0	2.4	3		G-cl-y-0.4	Х	
Officer South	BH18	0.5	BH18-0.5	EM2109285043	19/05/2021	360059	5783352	5.4	4.0	1.4	2		G-cl-y-0.4		
Officer South	BH18	1	BH18-1.0	EM2109285044	19/05/2021	360059	5783352	6.1	5.2	0.9	2		G-cl-y-0.4		
Officer South	BH18	2	BH18-2.0	EM2109285045	19/05/2021	360059	5783352	6.5	5.6	0.9	1		G-cl-y-0.4	-	
Officer South	BH18	3	BH18-3.0	EM2109285046	19/05/2021	360059	5783352	6.4	5.7	0.7	1		G-cl-y-0.4		
Officer South	BH19	0.1	BH19-0.1	EM2109392031	20/05/2021	359998	5782923	5.8	3.2	2.6	3		G-cl-y-0.4		
Officer South	BH19	0.5	BH19-0.5	EM2109392032	20/05/2021	359998	5782923	6.0	3.6	2.4	2		G-cl-y-0.4		
Officer South	BH19	0.5	DUP05-210520	EM2109392041	20/05/2021	359998	5782923	6.1	3.5	2.6	2		G-cl-y-0.4		
Officer South	BH19	0.5	DUP06_210520	M21-My45986	20/05/2021	359998	5782923	6.8	3.3	3.5	4		G-cl-y-0.4	_	
Officer South	BH19	1 2	BH19-1.0	EM2109392033	20/05/2021	359998	5782923	6.7	5.3	1.4	2		G-cl-y-0.4	-	
Officer South Officer South	BH19 BH19	3	BH19-2.0 BH19-3.0	EM2109392034 EM2109392035	20/05/2021	359998 359998	5782923 5782923	7.0 7.1	5.7 5.7	1.3 1.4	2		G-cl-y-0.4 G-cl-y-0.4	-	
1	DIIIJ		51113-310	LIVIE 103332033	20/03/2021	333336	3,02323	/.1	3.7	1.7	Z		G Ci y 0.4		
Officer South	BH25	0.1	BH25-0.1	EM2109285062	19/05/2021	360460	5782553	5.9	2.6	3.3	3		G-sd-n-0.4	Х	
Officer South	BH25	0.5	BH25-0.5	EM2109285063	19/05/2021	360460	5782553	6.2	4.5	1.7	2		G-sd-n-0.4		
Officer South	BH25	1	BH25-1.0	EM2109285064	19/05/2021	360460	5782553	6.2	4.9	1.3	1		G-sd-n-0.4		
Officer South	BH25	2	BH25-2.0	EM2109285065	19/05/2021	360460	5782553	6.6	5.5	1.1	1		G-sd-n-0.4		
Officer South	BH28	0.1	BH28-0.1	EM2109607034	24/05/2021	361346	5783965	5.5	3.9	1.6	4	v	G-cl-n-<0.3		More acidic with depth
Officer South	BH28	0.5	BH28-0.5	EM2109607035	24/05/2021	361346	5783965	5.7	4.0	1.7	4	X	G-cl-n-<0.3		more acidic with acptil
Officer South	BH28	1	BH28-1.0	EM2109607036	24/05/2021	361346	5783965	5.8	4.1	1.7	2	х	G-cl-n-<0.3		
Officer South	BH28	2	BH28-2.0	EM2109607037	24/05/2021	361346	5783965	5.4	4.2	1.2	1	х	G-cl-n-<0.3		
Officer South	BH28	3	BH28-3.0	EM2109607038	24/05/2021	361346	5783965	4.8	3.4	1.4	1	Х	G-cl-n-<0.3		
1															





									Acid Sulphat	te Soils - Field				Analys	is Selection Process Comment
								pH-F (Field pH test)*	рНFох	ΔpH (calculated)	Reaction Rate	Select for ASS analysis?	Soil profile	High organic surface	
								pH Unit	pH Unit	pH Unit		<u> </u>	<u> </u>	1	
QL					DACC many has an			0.1	0.1	0.1	1	<u> </u>	(/\)	<u> </u>	<u> </u>
							assessment is requir are likely to be prese	_	$\frac{3.0 \text{ and } < 5.0}{\leq 3.0}$	> 2.0	≥ 2 ≥ 2		(see notes)		
							ше ше у се ве р. ее	2.10				<u> </u>			
ite ID	Location Code	Depth Avg	Field ID	Sample Code	Date	X Coord	Y Coord								
Officer South	BH29	0.1	BH29-0.1	EM2109285053	19/05/2021	361101	5783372	5.9	2.7	3.2	3		B-sd-n-0.4	Х	
Officer South	BH29	0.5	BH29-0.5	EM2109285054	19/05/2021	361101	5783372	6.2	3.7	2.5	3		B-sd-n-0.4		
Officer South	BH29	1	BH29-1.0	EM2109285055	19/05/2021	361101	5783372	6.2	4.7	1.5	3		B-sd-n-0.4		
Officer South	BH29	2	BH29-2.0	EM2109285056	19/05/2021	361101	5783372	6.2	5.6	0.6	2		B-sd-n-0.4		
Officer South	BH29	3	BH29-3.0	EM2109285057	19/05/2021	361101	5783372	6.5	5.8	0.7	2		B-sd-n-0.4		
Officer South	ВН30	0.1	BH30-0.1	EM2109392001	20/05/2021	361015	5782779	5.4	3.5	1.9	1		G-cl-y-0.4		
Officer South	BH30	0.5	BH30-0.5	EM2109392002	20/05/2021	361015	5782779	5.2	3.6	1.6	2		G-cl-y-0.4		
Officer South	ВН30	1	BH30-1.0	EM2109392003	20/05/2021	361015	5782779	6.0	4.9	1.1	1		G-cl-y-0.4		
Officer South	BH30	2	BH30-2.0	EM2109392004	20/05/2021	361015	5782779	6.8	5.7	1.1	1		G-cl-y-0.4		
fficer South	BH30	3	BH30-3.0	EM2109392005	20/05/2021	361015	5782779	7.1	6.0	1.1	2		G-cl-y-0.4		
fficer South	BH32	0.1	BH32-0.1	EM2109392021	20/05/2021	360636	5781345	5.2	2.8	2.4	3		G-cl-y-0.4	Х	
fficer South	BH32	0.5	BH32-0.5	EM2109392022	20/05/2021	360636	5781345	6.1	4.3	1.8	2		G-cl-y-0.4	-	
fficer South	BH32 BH32	1 2	BH32-1.0 BH32-2.0	EM2109392023 EM2109392024	20/05/2021	360636 360636	5781345 5781345	7.4 7.5	5.7 5.6	1.7 1.9	1 1		G-cl-y-0.4 G-cl-y-0.4	-	
Officer South	BH32	2	ВН32-3.0	EM2109392025	20/05/2021	360636	5781345	7.7	5.7	2.0	1		G-cl-y-0.4		
The South	51132		51132 3.0		20,03,2021	300030	3701343	7.7	3.7	2.0			G Ci y 0.4		
Officer South	ВН33	0.1	BH33-0.1	EM2109392026	20/05/2021	360762	5780997	6.0	3.8	2.2	3	Х	G-sd-y-0.4		Naturally acidic profile
fficer South	ВН33	0.5	BH33-0.5	EM2109392027	20/05/2021	360762	5780997	6.0	3.7	2.3	3	х	G-sd-y-0.4		SPOCAS confirmation analysis with CRS
fficer South	ВН33	1	BH33-1.0	EM2109392028	20/05/2021	360762	5780997	7.1	5.0	2.1	2	Х	G-sd-y-0.4		
Officer South	BH33	2	BH33-2.0	EM2109392029	20/05/2021	360762	5780997	6.0	4.8	1.2	1	Х	G-sd-y-0.4		
fficer South	ВН33	3	BH33-3.0	EM2109392030	20/05/2021	360762	5780997	6.2	5.0	1.2	1		G-sd-y-0.4		
· · · · · · · · · · · · · · · · · · ·	21124		DU04.0.4		24/25/2024	251.100				1.0					
fficer South fficer South	BH34 BH34	0.1	BH34-0.1 BH34-0.5	EM2109607024	24/05/2021	361490 361490	5782407 5782407	5.9	4.1	1.8 2.2	4		G-sd-y->0.5		
fficer South	ВН34	1	ВН34-1.0	EM2109607025 EM2109607026	24/05/2021 24/05/2021	361490	5782407	7.5 7.2	5.3 5.4	1.8	2		G-sd-y->0.5 G-sd-y->0.5		
fficer South	BH34	2	BH34-2.0	EM2109607027	24/05/2021	361490	5782407	5.6	4.4	1.2	2		G-sd-y->0.5		
fficer South	BH34	3	BH34-3.0	EM2109607028	24/05/2021	361490	5782407	7.2	5.8	1.4	1		G-sd-y->0.5		
													<u> </u>		
fficer South	BH36	0.1	BH36-0.1	EM2109607006	24/05/2021	361322	5781214	6.2	4.4	1.8	4		B-cl-n-0.4		
fficer South	ВН36	0.5	BH36-0.5	EM2109607007	24/05/2021	361322	5781214	5.9	4.5	1.4	4		B-cl-n-0.4		
fficer South	ВН36	1	BH36-1.0	EM2109607008	24/05/2021	361322	5781214	6.0	4.6	1.4	2		B-cl-n-0.4		
fficer South	BH36	2	BH36-2.0	EM2109607009	24/05/2021	361322	5781214	6.5	5.6	0.9	2		B-cl-n-0.4		
fficer South	ВН36	3	BH36-3.0	EM2109607010	24/05/2021	361322	5781214	6.7	5.6	1.1	2		B-cl-n-0.4		
fficer South	ВН39	0.1	BH39-0.1	EM2109285028	19/05/2021	359195	5784742	5.1	2.5	2.6	2		G-cl-n-0.4	v	Most(?) acidic profile overall
fficer South	BH39	0.1	BH39-0.5	EM2109285028	19/05/2021	359195	5784742	5.5	4.1	1.4	3		G-cl-n-0.4 G-cl-n-0.4	X	iviositi:) acidic profile overall
fficer South	BH39	1	BH39-1.0	EM2109285030	19/05/2021	359195	5784742	5.3	3.9	1.4	2		G-cl-n-0.4		
Officer South	BH39	2	BH39-2.0	EM2109285031	19/05/2021	359195	5784742	5.5	4.2	1.3	1		G-cl-n-0.4		
fficer South	BH40	0.1	BH40-0.1	EM2109285015	19/05/2021	357624	5784214	7.2	3.2	4.0	3		G-sd-n-<0.3		
officer South	BH40	0.5	BH40-0.5	EM2109285016	19/05/2021	357624	5784214	6.9	5.0	1.9	2		G-sd-n-<0.3		
fficer South	BH40	1	BH40-1.0	EM2109285017	19/05/2021	357624	5784214	7.9	6.2	1.7	2		G-sd-n-<0.3		
Officer South	BH40	2	BH40-2.0	EM2109285018	19/05/2021	357624	5784214	7.7	6.6	1.1	3		G-sd-n-<0.3		
Officer South	BH40	3	BH40-3.0	EM2109285019	19/05/2021	357624	5784214	7.6	5.6	2.0	2		G-sd-n-<0.3		

Table D1
Victorian Planning Authority



									Acid Sulphat	e Soils - Field			,	Analys	is Selection Process Comment
								Hd pH-F (Field pH test)*	pH Unit	μο Πομ (calculated)	Reaction Rate	Select for ASS analysis?	Soil profile	High organic surface	
EQL								0.1	0.1	0.1	l 1		<u> </u>	1	
- 4					PASS may be no	esent further a	assessment is require			> 2.0	≥2	<u> </u>	(see notes)	1	
							are likely to be presen		≤ 3.0	> 2.0	≥ 2		(See Hotes)		
							, , , , , , , , , , , , , , , , , , , ,					<u> </u>			
Site ID	Location Code	Depth Avg	Field ID	Sample Code	Date	X Coord	Y Coord								
Officer South	BH41	0.1	BH41-0.1	EM2109285006	19/05/2021	357747	5784680	7.3	5.5	1.8	1		B-sd-n-0.4		
Officer South	BH41	0.5	BH41-0.5	EM2109285007	19/05/2021	357747	5784680	8.1	5.0	3.1	1	Х	B-sd-n-0.4		
Officer South	BH41	1	BH41-1.0	EM2109285008	19/05/2021	357747	5784680	6.8	4.1	2.7	3	Х	B-sd-n-0.4		
Officer South	BH41	2	BH41-2.0	EM2109285009	19/05/2021	357747	5784680	7.5	5.6	1.9	1		B-sd-n-0.4		
Officer South	BH41	3	BH41-3.0	EM2109285010	19/05/2021	357747	5784680	7.5	5.4	2.1	2	Х	B-sd-n-0.4		
1															
Officer South	BH42	0.1	BH42-0.1	EM2109607001	24/05/2021	361240	5780623	5.7	4.1	1.6	4		G-cl-n-0.4		More acidic with depth
Officer South	BH42	0.5	BH42-0.5	EM2109607002	24/05/2021	361240	5780623	6.2	4.1	2.1	3		G-cl-n-0.4		
Officer South	BH42	1	BH42-1.0	EM2109607003	24/05/2021	361240	5780623	6.4	4.7	1.7	2		G-cl-n-0.4		
Officer South	BH42	2	BH42-2.0	EM2109607004	24/05/2021	361240	5780623	5.6	4.5	1.1	2		G-cl-n-0.4		
Officer South	BH42	3	BH42-3.0	EM2109607005	24/05/2021	361240	5780623	5.7	4.4	1.3	2		G-cl-n-0.4		
1															
Officer South	BH43	0.1	BH43-0.1	EM2109498034	21/05/2021	358094	5783191	5.5	2.5	3.0	3		G-cl-n-0.4	Х	
Officer South	BH43	0.5	BH43-0.5	EM2109498035	21/05/2021	358094	5783191	6.4	4.1	2.3	2		G-cl-n-0.4		
Officer South	BH43	1	BH43-1.0	EM2109498036	21/05/2021	358094	5783191	7.0	4.3	2.7	2		G-cl-n-0.4		
Officer South	BH43	2	BH43-2.0	EM2109498037	21/05/2021	358094	5783191	7.1	5.2	1.9	1		G-cl-n-0.4		
Officer South	BH43	3	BH43-3.0	EM2109498038	21/05/2021	358094	5783191	7.3	5.6	1.7	1		G-cl-n-0.4		
1															
Officer South	BH44	0.1	BH44-0.1	EM2109607015	24/05/2021	361734	5781887	6.0	4.0	2.0	3	Х	G-cl-n-<0.3		More acidic with depth
Officer South	BH44	0.5	BH44-0.5	EM2109607016	24/05/2021	361734	5781887	6.0	4.2	1.8	2		G-cl-n-<0.3		
Officer South	BH44	1	BH44-1.0	EM2109607017	24/05/2021	361734	5781887	5.3	3.7	1.6	2	Х	G-cl-n-<0.3		
Officer South	BH44	2	BH44-2.0	EM2109607018	24/05/2021	361734	5781887	4.9	3.8	1.1	2	Х	G-cl-n-<0.3		
Officer South	BH44	3	BH44-3.0	EM2109607019	24/05/2021	361734	5781887	4.7	3.8	0.9	2	Х	G-cl-n-<0.3		
Statistics															
Number of Results								104	104		101				
Minimum Detect								4.7	2.3		1				
Maximum Concent	ration							8.1	8		4				
Average Concentra								6.3	4.5		2.1				
95% UCL (Student's								6.459	4.658		2.297		1		
% of Detects								100	100		100		1		
% of Non-Detects								0	0		0	-			
70 OI NOII-DELECTS										l		II.	I	I	

^{*} A Non Detect Multiplier of 0.5 has been applied.

Soil Profile Notes:

G: Grey colour
B: Brown colour

cl: Predominantly clay to depth
sd: Sand layer encountered at depth
n: No silt layer above clay

y: Silt layer above clay



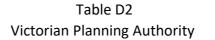
		Soil F	Properties	Partic	le Size								Inorganics			
	% % Moisture	Emerson Class Number	· Texture	ם <2mm Fraction	ට >2mm Fraction	% Analysed Material	- Color (Munsell)	চ Conductivity (1:5 3 aqueous extract)	Exchangeable Calcium Percent_	Exchangeable Magnesium Percent_	Exchangeable Potassium Percent_	Exchangeable Sodium Percent	% Extraneous Material	Exchangeable Calcium	Exchangeable Magnesium	Exchangeable Botassium
EQL	1			0.005	0.005	0.1		10	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1

Locatio	on Code	Soil Profile	Depth Avg	Field ID	Sample Code	Date																
outh BH01		B-sd-n-0.4	0.1	BH01-0.1	EM2109285001	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	<u> </u>	-	
			0.5	BH01-0.5	EM2109285002	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
					EM2110602001	19/05/2021	-	2	#1 Sandy Clay Loam	-	-	-	#2 Grayish Brown (2.5Y 5/2)	-	18.5	62.6	2.6	16.3	-	1.9	6.6	C
			1	BH01-1.0	EM2109285003	19/05/2021	-	-	-	_	-	-	-	_	-	-	-	-	-	-	-	+-
			-	51102 210	EM2110602002	19/05/2021	_	2	#3 Light Medium Clay		_	_	#4 Dark Grayish Brown (2.5Y 4/2)	_	18.2	63.9	2.8	15.1	_	2.5	8.8	C
			2	BH01-2.0	EM2109285004	19/05/2021		-		 _ 	_	_		_	-	-	-	-	_		-	<u> </u>
			_	5.102 2.0	EM2110602003	19/05/2021	_	2	#5 Sandy Loam		-	_	#4 Dark Grayish Brown (2.5Y 4/2)	_	18.5	56.2	<0.2	25.3	-	0.6	1.9	<
			2	BH01-3.0	EM2109285005	19/05/2021	_	-	-	_	-	-	-	_	-	-	-	-	_	-	-	+
				D1101-3.0	EM2110602004	19/05/2021		2	#5 Sandy Loam	-	_		#6 Light Brownish Gray (2.5Y 6/2)	_	16.6	53.9	3.5	26.1	_	0.8	2.5	<
BH02		B-cl-n-0.4	0.1	BH02-0.1	EM2110602005	19/05/2021		2	#7 Clay Loam	-			#8 Light Olive Brown (2.5Y 5/3)		-	55.5	-	14.8	_	3.3	7.1	
ВПО2		D-CI-II-U.4	0.5	BH02-0.5	EM2110602005	19/05/2021	<u> </u>	2	#3 Light Medium Clay	 	-	-	#8 Light Olive Brown (2.5Y 5/3)	-	-	-		25.5	-	2.2	6.9	
			1	BH02-0.3	EM2110602007	19/05/2021	-	2	#3 Light Medium Clay	 		-	#2 Grayish Brown (2.5Y 5/2)	-	15.6	54.2	1.4	28.8		2.7	9.5	
ВН03		B-cl-n-0.4	0.1	BH03-0.1	EM2109498010	21/05/2021	-		·	 	-	-	#2 Grayisii Biowii (2.51 3/2)	-		34.2			-	2.7		+
Впоз		B-CI-n-U.4	0.1	BH03-0.1			-	-	-	-	-	-	<u>-</u>	-	-	-	-	-	-		-	+
				DUDOZ 240524	EM2110602008	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-			+-
				DUP07-210521	EM2109498015	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	- '	-	+
				DUDO0 240524	EM2110602068	21/05/2021	-	-	-	- -	-	-	-	-	-	-	-	-	-	- '	-	+
				DUP08-210521	M21-My47278	21/05/2021	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
				DUP08_210520	M21-Jn04611	21/05/2021	18	-	-	200	<0.005	100	-	-	-	-	-	-	<0.1	-	-	₩
			0.5	BH03-0.5	EM2109498011	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	/		+-
			1	BH03-1.0	EM2109498012	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	- '	-	4
			2	BH03-2.0	EM2109498013	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	<u> </u>	-	_
			3	BH03-3.0	EM2109498014	21/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	\bot
ВН08	(G-cl-n->0.5	1	BH08-1.0	EM2110602009	19/05/2021	-	2	#3 Light Medium Clay	-	-	-	#2 Grayish Brown (2.5Y 5/2)	-	-	-	-	20.8	-	1.7	7.6	
			2	BH08-2.0	EM2110602010	19/05/2021	-	2	#3 Light Medium Clay	-	-	-	#6 Light Brownish Gray (2.5Y 6/2)	-	-	-	-	25.9	-	0.5	2.2	
ВН09	(G-cl-y->0.5	0.1	BH09-0.1	EM2110602011	21/05/2021	-	2	#9 Light Clay	-	-	-	#4 Dark Grayish Brown (2.5Y 4/2)	-	-	-	-	23.8	-	0.8	1.6	
			1	BH09-1.0	EM2110602013	21/05/2021	-	2	#9 Light Clay	-	-	-	#8 Light Olive Brown (2.5Y 5/3)	-	-	-	-	29.4	-	0.6	8.9	
BH11	ļ.	B-sd-n-0.4	0.1	BH11-0.1	EM2109498001	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
					EM2110602014	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			0.5	BH11-0.5	EM2109498002	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
					EM2110602015	21/05/2021	-	3	#9 Light Clay	-	-	-	#10 Dark Olive Brown (2.5Y 3/3)	-	1	-	-	4.6	-	0.7	4.5	
			1	BH11-1.0	EM2109498003	21/05/2021	-	-	-	-	-	-	-	-	1	ı	-	-	-	-	-	
					EM2110602016	21/05/2021	-	2	#1 Sandy Clay Loam	-		-	#11 Light Olive Brown (2.5Y 5/4)	-	-	-	-	13.8	-	1.5	9.4	
			2	BH11-2.0	EM2109498004	21/05/2021	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
					EM2110602017	21/05/2021	-	2	#9 Light Clay	-		-	#12 Light Olive Brown (2.5Y 5/6)	-	-	-	-	26.4	-	0.9	5.4	
			3	BH11-3.0	EM2109498005	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	- '	-	
					EM2110602018	21/05/2021	-	2	#9 Light Clay	-		-	#11 Light Olive Brown (2.5Y 5/4)	-	13.0	55.8	< 0.2	31.2	-	0.6	2.6	
BH17		G-cl-n-0.4	0.1	BH17-0.1	EM2109498016	21/05/2021	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
			0.5	BH17-0.5	EM2109498017	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T
					EM2110602019	21/05/2021	-	2	#1 Sandy Clay Loam	-	-	-	#13 Grayish Brown (10YR 5/2)	-	-	-	-	10.9	-	1.1	1.7	
			1	BH17-1.0	EM2109498018	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
					EM2110602020	21/05/2021	-	2	#3 Light Medium Clay	-	-	-	#8 Light Olive Brown (2.5Y 5/3)	-	-	-	-	15.3	-	1.5	7.2	T
			2	BH17-2.0	EM2109498019	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	- '	-	
					EM2110602021	21/05/2021	-	2	#1 Sandy Clay Loam	-	-	-	#2 Grayish Brown (2.5Y 5/2)	-	-	-	-	22.9	-	0.6	4.0	
			3	BH17-3.0	EM2109498020	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
					EM2110602022	21/05/2021	-	2	#7 Clay Loam	-	-	-	#8 Light Olive Brown (2.5Y 5/3)	-	-	-	-	21.7	-	1.0	5.4	T
				DUP09-210521	EM2109498021	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\top
	- 1				EM2110602069	21/05/2021	-	2	#7 Clay Loam	 - 	-	-	#8 Light Olive Brown (2.5Y 5/3)	-	-	-	-	21.9	-	1.0	5.2	\top
	- 1			DUP10-210521	M21-My47279	21/05/2021	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\top
	- 1			DUP10_210520	M21-Jn04612	21/05/2021	17	2	-	- 1	-	-	-	290	-	-	-	32	-	-	-	T
ВН18		G-cl-y-0.4	0.1	BH18-0.1	EM2109285042	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	\top
			0.5	BH18-0.5	EM2109285043	19/05/2021	-	-	-	 - 	-	-	-	-	-	-	-	-	-	-	-	+
			1	BH18-1.0	EM2109285044	19/05/2021	-	-	-	 _ 	-	-	-	-	-	-	-	-	-	-	-	T
	- 1		2	BH18-2.0	EM2109285045	19/05/2021	_	-	_	 _ 	-	_	-	_	-	-	-	-	-	 - '	-	+
	- 1		3	BH18-3.0	EM2109285046	19/05/2021	_	-	_	 _ 	-	-	-	_	-	_	_	-	_	 - 	_	+
ВН19		G-cl-y-0.4	0.1	BH19-0.1	EM2109392031	20/05/2021	_	_	_	 _ 	-	-	-	_	-	_	_	-	_	 	_	+
5,113	ľ	J J. 7 J. 7			EM2110602023	19/05/2021	_	2	#9 Light Clay	 _ 	_	_	#14 Dark Grayish Brown (10YR 4/2)		_	_	_	4.3	_	4.3	4.8	+
	- 1		0.5	BH19-0.5	EM2109392032	20/05/2021		-	#5 Light Clay	-	_	_		_	_		_	-	_	-	-	+
				525 0.5	EM2110602024	19/05/2021		2	#5 Sandy Loam	 _ 	_	_	#15 Dark Gray (10YR 4/1)		_	_	_	14.3	_	0.7	1.3	+
	- 1			DUP05-210520	EM2109392041	20/05/2021		-	-	-	-	-		-	-		-	-	_	-	-	+
	- 1			20103-210320	EM2110602067	20/05/2021	-	2	#9 Light Clay	-	-		#16 Olive Brown (2.5Y 4/3)					16.6		0.6	1.4	+
	- 1			DUDOS 310530	M21-Jn04610	20/05/2021	1.1	2	<u> </u>	╟	-			12	_		<u> </u>		-			+
				DUP06_210520			4.4	2	-	 	-	-	-	43	-	-	-	13	-	-	-	+
			1	DU10 1 0	M21-My45986	20/05/2021	<u> </u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
			1 *	BH19-1.0	EM2109392033	20/05/2021	-	2	#1 Sandy Clay Loam	-	-	-	+9 Light Olive Prove /2 EV E /2\	-	-	-	-	10.6	-	- 0.8	17	+
	- 1			D140 2 2	EM2110602025	19/05/2021	-	2	#1 Sandy Clay Loam	-	-	-	#8 Light Olive Brown (2.5Y 5/3)	-	-	-	-	18.6	-	0.8	4.7	+
	- 1		²	BH19-2.0	EM2109392034	20/05/2021	-	-		 	-	-	- (2.5)(5.4)	-	-		-	-	-	-	-	+-
					EM2110602026	19/05/2021	 -	2	#1 Sandy Clay Loam	∥ -	-	-	#11 Light Olive Brown (2.5Y 5/4)	-	10.0	57.8	1.3	30.8	-	1.4	8.0	



	Soil I	Properties	Partic	le Size			, and the second				ا	Inorganics			
% Moisture	Emerson Class Number	Texture	<2mm Fraction	>2mm Fraction	Analysed Material	Color (Munsell) Conductivity (1:5	מלמבסמים שבו	Exchangeable Calcium Percent_ Exchangeable	Magnesium Percent	Potassium Percent_	Exchangeable Sodium Percent	Extraneous Material	Exchangeable Calcium	Exchangeable Magnesium	Exchangeable Potassium
%	-	-	G	G	%	- μs/cr	m	% 9	6	%	%	%	meq/100g	meq/100g	meq/100g
1			0.005	0.005	0.1	10		0.2 0	.2 0	0.2	0.1	0.1	0.1	0.1	0.1

	de Soil Profile	Depth Avg	Field ID	Sample Code	Date													
		3	BH19-3.0	EM2109392035	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
BH21	G-cl-n-0.4	0.5	BH21-0.5	EM2110602027	19/05/2021	-	3	#9 Light Clay		-	#4 Dark Grayish Brown (2.5Y 4/2)	-	-	-	-	11.0	- 0.5	7.2
		1	BH21-1.0	EM2110602028	19/05/2021	-	2	#3 Light Medium Clay		-	#2 Grayish Brown (2.5Y 5/2)	-	-	-	-	15.8	- 0.4	5.6
		2	BH21-2.0	EM2110602029	19/05/2021	-	2	#1 Sandy Clay Loam		_	#2 Grayish Brown (2.5Y 5/2)	-	-	-	_	26.5	- 0.2	2.2
BH22	B-cl-n-0.4	0.5	BH22-0.5	EM2110602030	21/05/2021	_	2	#3 Light Medium Clay	_ _	 	#13 Grayish Brown (10YR 5/2)	_	_	_	_	9.4	- 1.8	3.6
522	D CI II 0.4	1	BH22-1.0	EM2110602031	21/05/2021	_	2	#3 Light Medium Clay		-	#17 Brown (10YR 5/3)	_	 	_	 	18.1	- 1.6	6.7
		1				-	2			-			 	-	-			+
	2 1 2 2	2	BH22-2.0	EM2110602032	21/05/2021	-	2	#3 Light Medium Clay		 	#2 Grayish Brown (2.5Y 5/2)	-	-	-	-	15.3	- 1.2	5.9
BH24	B-cl-y-0.4	0.5	BH24-0.5	EM2110602033	19/05/2021	-	2	#1 Sandy Clay Loam		<u> </u>	#13 Grayish Brown (10YR 5/2)	-	-	-	-	14.1	- 2.0	7.1
		1	BH24-1.0	EM2110602034	19/05/2021	-	2	#18 Medium Clay		-	#4 Dark Grayish Brown (2.5Y 4/2)	-	-	-	-	19.4	- 1.6	10.3
		2	BH24-2.0	EM2110602035	19/05/2021	-	3	#3 Light Medium Clay		-	#19 Gray (2.5Y 6/1)	-	-	-	-	29.5	- 0.9	7.3
BH25	G-sd-n-0.4	0.1	BH25-0.1	EM2109285062	19/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602036	19/05/2021	-	2	#20 Silty Loam		T -	#21 Very Dark Brown (10YR 2/2)	-	-	-	-	3.7	- 4.8	1.7
		0.5	BH25-0.5	EM2109285063	19/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602037	19/05/2021	-	2	#3 Light Medium Clay		_	#4 Dark Grayish Brown (2.5Y 4/2)	-	-	-	-	16.4	- 0.8	0.8
		1	BH25-1.0	EM2109285064	19/05/2021	_	-	-		 	-	-	_	_	_	-		-
		1	B1123-1.0	EM2110602038	19/05/2021		2	#9 Light Clay		 	#2 Grayish Brown (2.5Y 5/2)			_		29.4	<u> </u>	6.6
		2	DU25 2 0			-		<u> </u>		-	#2 Grayish Brown (2.51 5/2)	-	-	-	-		- 1.1	
		2	BH25-2.0	EM2109285065	19/05/2021	-	-	-		-	- (2	-	-	-	-	-		-
				EM2110602039	19/05/2021	-	2	#5 Sandy Loam		-	#2 Grayish Brown (2.5Y 5/2)	-	-	-	-	22.7	- 0.6	3.7
BH26	B-cl-y-0.4	0.5	BH26-0.5	EM2110602040	20/05/2021	-	2	#5 Sandy Loam		-	#14 Dark Grayish Brown (10YR 4/2)	-	-	-	-	8.6	- 0.8	1.0
		1	BH26-1.0	EM2110602041	20/05/2021	-	2	#3 Light Medium Clay		-	#2 Grayish Brown (2.5Y 5/2)	-	20.6	51.9	1.8	25.8	- 2.7	6.8
		2	BH26-2.0	EM2110602042	20/05/2021	-	2	#9 Light Clay		-	#8 Light Olive Brown (2.5Y 5/3)	-	18.1	49.5	1.6	30.8	- 1.7	4.6
BH28	G-cl-n-<0.3	0.1	BH28-0.1	EM2109607034	24/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602043	24/05/2021	-	-	-		_	-	-	-	-	-	-		-
		0.5	BH28-0.5	EM2109607035	24/05/2021	-	_	_		 -	_	-	-	_	_	_		-
		0.5	5.1.20 0.3	EM2110602044	24/05/2021	_	2	#3 Light Medium Clay		 -	#22 Dark Gray (2.5Y 4/1)	-	_	_	_	12.6	- 1.9	3.5
		1	BH28-1.0	EM2109607036	24/05/2021		2	#3 Light Mediani Clay		┨——	#22 Dark Gray (2.51 4/1)		 	_	_	12.0	1.9	3.5
		1	BH28-1.0			-	-	- "2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		 	- 145 De 1 Con (40VD 4/4)	-	-	-	-	- 12.5		- 1.2
				EM2110602045	24/05/2021	-	2	#3 Light Medium Clay		<u> </u>	#15 Dark Gray (10YR 4/1)	-	-	-	-	13.5	- 1.6	4.2
		2	BH28-2.0	EM2109607037	24/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602046	24/05/2021	-	3	#7 Clay Loam		-	#16 Olive Brown (2.5Y 4/3)	-	-	-	-	13.3	- 1.4	4.5
		3	BH28-3.0	EM2109607038	24/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602047	24/05/2021	-	-	-		-	-	-	-	-	-	-		-
BH29	B-sd-n-0.4	0.1	BH29-0.1	EM2109285053	19/05/2021	-	-	-		-	-	-	-	-	-	-		-
		0.5	BH29-0.5	EM2109285054	19/05/2021	-	-	-		-	-	-	-	-	-	-		-
		1	BH29-1.0	EM2109285055	19/05/2021	-	-	-		-	-	-	-	-	-	-		-
		2	BH29-2.0	EM2109285056	19/05/2021	_	_	_		 -	_	-	-	_	_	_		-
		2	BH29-3.0	EM2109285057	19/05/2021		_	<u> </u>		-	_	-	_	_	_	 		_
ВН30	C d v 0 4	0.1	BH30-0.1	EM2109392001	20/05/2021	-	_	-		- 		_	_	_		_		
впэи	G-cl-y-0.4		_			-			 	-	-			-	-	-	+ +	-
		0.5	BH30-0.5	EM2109392002	20/05/2021	-	-	-		 	-	-	-	-	-	-		-
		1	BH30-1.0	EM2109392003	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
		2	BH30-2.0	EM2109392004	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
		3	BH30-3.0	EM2109392005	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
BH32	G-cl-y-0.4	0.1	BH32-0.1	EM2109392021	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602048	20/05/2021	-	2	#5 Sandy Loam		-	#23 Very Dark Gray (2.5Y 3/1)	-	-	-	-	12.0	- 1.4	0.6
		0.5	BH32-0.5	EM2109392022	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602049	20/05/2021	-	2	#5 Sandy Loam		<u> </u>	#4 Dark Grayish Brown (2.5Y 4/2)	-	_	-	-	21.0	- 0.8	0.6
		1	BH32-1.0	EM2109392023	20/05/2021	-	-	-		<u> </u>	-	-	-	_	_	-		_
		-	51.02 1.0	EM2110602050	20/05/2021	_	2	#7 Clay Loam		 	#16 Olive Brown (2.5Y 4/3)	_	13.3	55.0	1.7	30.0	- 1.5	6.1
		2	BH32-2.0	EM2109392024		1		#7 Clay Loaili	 	-	#10 Olive Blown (2.51 4/3)		1	33.0	1.7		1.5	0.1
		l ²	БП32-2.0		20/05/2021	-	-	- HO Light Class		-	- +2 Crevish Braves /2 EV E/2)	-	10.6		1.0	-		7.6
				EM2110602051	20/05/2021	-		#9 Light Clay		 	#2 Grayish Brown (2.5Y 5/2)	-	10.6	54.2	1.9	33.3	- 1.5	7.6
		3	BH32-3.0	EM2109392025	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
вн33	G-sd-y-0.4	0.1	BH33-0.1	EM2109392026	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602052	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
		0.5	BH33-0.5	EM2109392027	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
				EM2110602053	20/05/2021	-	2	#5 Sandy Loam		-	#4 Dark Grayish Brown (2.5Y 4/2)	-	-	-	-	8.4	- 1.2	0.7
						-	-	-		-	-	-	-	-	-	-		-
1		1	BH33-1.0	EM2109392028	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
1				EM2110602054	20/05/2021	-	2	#3 Light Medium Clay		<u> </u>	#13 Grayish Brown (10YR 5/2)	-	_	_	_	21.6	- 0.6	8.0
1		2	BH33-2.0	EM2109392029	20/05/2021	-	-			 		_	-			-	- 0.0	- 8.0
		1	Di133-2.0			 	2	#7 Clay Loam	 		#24 Gray (10VP E/1)		1		 			
		2	D1122 2 2	EM2110602055	20/05/2021	-	2	#7 Clay Loam		-	#24 Gray (10YR 5/1)	-	-	-	-	21.9	- 0.7	10.4
		3	BH33-3.0	EM2109392030	20/05/2021	-	-	-		-	-	-	-	-	-	-		-
BH34	G-sd-y->0.5	0.1	BH34-0.1	EM2109607024	24/05/2021	-	-	-		-	-	-	-	-	-	-		-
		0.5	BH34-0.5	EM2109607025	24/05/2021	-	-	-		-	-	-	-	-	-	-		-
			DU24 4 0	EM2109607026	24/05/2021	-	-	-		-	-	-	-	-	-	-		-
		1	BH34-1.0	EIVIZ109607026	24/03/2021													
		2	BH34-1.0 BH34-2.0	EM2109607027	24/05/2021	-	-	-		-	-	-	-	-	-	-		-





							Soil I	Properties	Parti	icle Size								Inorganics		_	
						% Moisture	Emerson Class Number	Texture	<2mm Fraction	>2mm Fraction	Analysed Material	Color (Munsell)	Conductivity (1:5 aqueous extract)	Exchangeable Calcium Percent_	Exchangeable Magnesium Percent_	Exchangeable Potassium Percent_	Exchangeable Sodium Percent	Extraneous Material	Exchangeable Calcium	Exchangeable Magnesium	
						%	-	-	G	G	%	-	μs/cm	%	%	%	%	%	meq/100g	meq/100	0
						1			0.005	0.005	0.1		10	0.2	0.2	0.2	0.1	0.1	0.1	0.1	
																			,		
Location Code		Depth Avg	Field ID	Sample Code	Date				11		п					1	1				_
внз6	B-cl-n-0.4	0.1	BH36-0.1	EM2109607006	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		0.5	BH36-0.5	EM2109607007 EM2110602056	24/05/2021 24/05/2021	-	2	#3 Light Medium Clay	<u> </u>	-	-	+25 Very Dark Gray (10YR 3/1)	-	-	-	-	11.7	-	3.1	7.4	_
		1	BH36-1.0	EM2109607008	24/05/2021	-	-	+3 Light Mediam Clay	-	-	-		-	-	-	-	-	_	-	-	
				EM2110602057	24/05/2021	-	2	#9 Light Clay	-	-	-	#26 Gray (2.5Y 5/1)	-	-	-	-	13.9	-	2.0	6.9	_
		2	BH36-2.0	EM2109607009	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				EM2110602058	24/05/2021	-	2	#3 Light Medium Clay	-	-	-	#8 Light Olive Brown (2.5Y 5/3)	-	-	-	-	18.2	-	1.6	6.4	_
		3	ВН36-3.0	EM2109607010	24/05/2021	-	-	#0.1:-b+.Cl	-	-	-	- 40 Light Olive Presses (2.57.5./2)	-	-	-	-	10.1	-	- 1.0	- 4.0	_
ВН39	G-cl-n-0.4	0.1	BH39-0.1	EM2110602059 EM2109285028	24/05/2021 19/05/2021	-		#9 Light Clay -	-	-	-	#8 Light Olive Brown (2.5Y 5/3)	-	-	-	-	16.1	-	1.0	4.0	_
B1133	G-CI-II-0.4	0.5	BH39-0.5	EM2109285029	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	_	-	_
		1	BH39-1.0	EM2109285030	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		2	BH39-2.0	EM2109285031	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ВН40	G-sd-n-<0.3	0.1	BH40-0.1	EM2109285015	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		0.5	BH40-0.5	EM2109285016	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		1	BH40-1.0 BH40-2.0	EM2109285017 EM2109285018	19/05/2021 19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		3	BH40-3.0	EM2109285019	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
BH41	B-sd-n-0.4	0.1	BH41-0.1	EM2109285006	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	_	-	_
		0.5	BH41-0.5	EM2109285007	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				EM2110602060	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		1	BH41-1.0	EM2109285008	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		2	BH41-2.0	EM2110602061 EM2109285009	19/05/2021 19/05/2021	-	-	-	-	-	-	- -	-	-	-	-	-	-	-	-	_
		3	BH41-3.0	EM2109285010	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
				EM2110602062	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
BH42	G-cl-n-0.4	0.1	BH42-0.1	EM2109607001	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		0.5	BH42-0.5	EM2109607002	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		1 2	BH42-1.0 BH42-2.0	EM2109607003 EM2109607004	24/05/2021 24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		3	BH42-3.0	EM2109607005	24/05/2021	-	<u> </u>	-	-	-	_	-	_	-	-	_	_		-	_	_
ВН43	G-cl-n-0.4	0.1	BH43-0.1	EM2109498034	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		0.5	BH43-0.5	EM2109498035	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		1	BH43-1.0	EM2109498036	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		2	BH43-2.0	EM2109498037	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
BH44	G-cl-n-<0.3	0.1	BH43-3.0 BH44-0.1	EM2109498038 EM2109607015	21/05/2021 24/05/2021	-	-	-	<u> </u>	-	-	-	-	-	-	-	-	-	-	-	_
ВП44	G-CI-II-<0.5	0.1	БП44-0.1	EM2110602063	24/05/2021	-	-	-	-	-		-	-	-	-	-	-		-	-	
		0.5	BH44-0.5	EM2109607016	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		1	BH44-1.0	EM2109607017	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
				EM2110602064	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		2	BH44-2.0	EM2109607018	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		2	BHW 3 0	EM2110602065 EM2109607019	24/05/2021 24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
İ		3	BH44-3.0	EM2110602066	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
			-	, 	_ ·/ ·/	II	1	Ī	11	1	11									I	_

Statistics																
Number of Results	5	55	55	1	1	1	55	2	11	11	11	57	1	55	55	55
Minimum Detect	4.4	2	1	200	ND	100	1	43	10	49.5	1.3	3.7	ND	0.2	0.6	0.1
Maximum Concentration	24	3	1	200	<0.005	100	1	290	20.6	63.9	3.5	33.3	<0.1	4.8	10.4	1
Average Concentration *	16	2.1	1				1	166	16	56	1.7	19		1.4	5.1	0.19
95% UCL (Student's-t) *	22.9	2.132	1				1	946.2	17.65	58.23	2.274	20.9		1.616	5.733	0.235
% of Detects	100	100	100	100	0	100	100	100	100	100	82	100	0	100	100	67
% of Non-Detects	0	0	0	0	100	0	0	0	0	0	18	0	100	0	0	33

^{*} A Non Detect Multiplier of 0.5 has been applied.

Soil Profile Notes:

G: Grey colour

B: Brown colour

cl: Predominantly clay to depth sd: Sand layer encountered at depth

n: No silt layer above clay y: Silt layer above clay



								Acid S	ulphate Soils	- Field			Acid Sulp	hate Soils - A	cidity Trail		Acid Su	ılphate	
	Exchangeable Sodium	CEC	Electrical Conductivity (Lab)	Calcium/Magnesium Ratio	Magnesium/Potassiu m Ratio	рн (Lab)	pH-F (Field pH test)*	рНFох	хо-на	Reaction Ratings*	Reaction Rate	Titratable Actual Acidity (sulfur units)	Titratable Peroxide Acidity (sulfur units)	Titratable Sulfidic Acidity (sulfur units)	Titratable Actual Acidity	Titratable Sulfidic Acidity	CRS Suite - Net Acidity (Acidity Units)	CRS Suite - Net Acidity (Sulfur Units)	ANC Fineness Factor
	meq/100g	meq/100g	μS/cm	No unit	-	pH Unit	PH UNITS	PH UNITS	pH Units	COMMENT	mg/kg	%S	%S	% pyrite S	mole H+/t	mole H+/t	MOL H+/T	% S	-
EQL	0.1	0.1	1	0.2		0.1	0.1	0.1	0.1		1	0.003	0.02	0.02	2	2	10	0.02	0.5

						0.1	0.1	1	0.2		0.1	0.1	0.1	0.1		1	0.003	0.02	0.02		2	10	0.02
Location Co	ode Soil Profile	Denth Avg	Field ID	Sample Code	Date																		
BH01				· · · · · · · · · · · · · · · · · · ·			T .		T		T	F 7	2 5	T		1 2	1	T	ī		$\overline{}$		
BHOI	D-3u-11-0.4	No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No. No.																					
		0.5	Mart Mart																				
			Web-1-1																				
		1	95 May Miller Mi																				
			Main																				
		2	BH01-2.0	Miles Mile																			
				Main Main																			
		3	BH01-3.0		Note Note																		
			51101-3.0	Management Man																			
D1103	D al	0.4	DU02 0 4	Note Note																			
ВН02	B-cl-n-0.4			MILESPORD 1967/811 2																			
		0.5 BH01-0.5 1 BH01-1.0 2 BH01-2.0 3 BH01-3.0 Cl-n-0.4 0.1 BH02-0.1 0.5 BH02-0.5 1 BH02-1.0 DUP07-21052 DUP08-21052 DUP08_21052 DUP09-21052 DUP10_21052 DUP10_21052 DUP06_21052 DUP06_21052 DUP06_21052 DUP06_21052 DUP06_21052					+					-	-	-	-	-	-	-	-	-			-
		1	BH02-1.0	EM2110602007	19/05/2021	5.0	17.5	528	0.3	39.6	7.4	-	-	-	-	-	-	-	-	-	-	-	-
ВН03	B-cl-n-0.4	0.1	BH03-0.1	EM2109498010	21/05/2021	-	-	-	-	-	-	6.2	2.3	-	-	3	-	-	-	-	-	-	-
				EM2110602008	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	16	-	-	-
			DUP07-210521	EM2109498015		_	-	-	_	-	-	6.2	3.0	-	-	3	-	_	-	_	_	1 -	_
	G-cl-n-0.4 G-cl-n->0.5 G-cl-y->0.5 B-sd-n-0.4 G-cl-n-0.4 G-cl-n-0.4 G-cl-n-0.4					-	_	_	_	_	_	1		 -	_		0.03	_		18	+ -	-	_
	G-cl-n->0.5 G-cl-y->0.5 B-sd-n-0.4		DUD09 210521								1	-					1			10		-	
	108 G-cl-n->0.5 1 20 3109 G-cl-y->0.5 0 1111 B-sd-n-0.4 0 112 33 3417 G-cl-n-0.4 0				_	-		-				0.9		-			 	-		-			
	3H08 G-cl-n->0.5 1 2 3H09 G-cl-y->0.5 0 1 3H11 B-sd-n-0.4 0 1 2 3H17 G-cl-n-0.4 0					-	-	-	-	-	-	-		-	-	-	0.060	-	-	36		36	0.06
	0.9 3	0.5				-	-	-	-	-	-	6.2		-	-	2	-	-	-	-	-		-
	G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4 G-cl-y-0.4	1	BH03-1.0	EM2109498012		-	-	-	-	-	-	7.2	5.5	-	-	2	-	-	-	-	-	-	-
	B-sd-n-0.4 B-cl-n-0.4 B-cl-n-0.4 B-cl-n-0.4 D.1 D.5 1	2	BH03-2.0	EM2109498013	21/05/2021	-	-		-	-	-	7.8	5.8		-	2		-	-		-	-	
		3	BH03-3.0	EM2109498014	21/05/2021	-	-	-	-	-	-	7.8	8.0	-	-	4	-	-	-	-	-	-	-
BH08	G-cl-n->0.5	1				2.5	11.9	508	-	-	6.6	-		-	-	-	-	-	-	-	-	1 -	-
	3.3	2								_		<u> </u>		-		_	1	_		_		1 -	
BHOO	G d v >0 F	0.1					+										 					-	
БПОЭ	G-CI-y->0.5	0.1				_	+										1					-	
		1				4.0																	
BH11	B-sd-n-0.4	0.1	BH11-0.1			-	-	1.															
				EM2110602014	21/05/2021	-	-	-	-	-	1												
		0.5	BH11-0.5	EM2109498002	21/05/2021	-	-	-	1														
				EM2110602015	21/05/2021	0.3	6.2	65	1														
		1	BH11-1.0						1														
			51122 210			1.8	+	113	<u> </u>	_	1												
			BU11 2 0			1.0		113	<u> </u>		1.												
		2	BH11-2.0			-		-	-	-	7.4 6.5 4.9 . </td												
						2.3	8.7	150	-	1													
		3	BH11-3.0				-	150 0.5 206 7.7 0.5 4.9 0.5 1.5 0.5															
				EM2110602018	21/05/2021	1.5	1																
BH17	G-cl-n-0.4	0.1	BH17-0.1	EM2109498016	21/05/2021	-	-	100 0.3 206 204 0.4 0.5															
		0.5	BH17-0.5	EM2109498017	22 1968/2003 17	-																	
			0.1 BH01-0.1 EM210928500 0.5 BH01-0.5 EM210928500 EM211060200 1 BH01-1.0 EM210928500 EM211060200 2 BH01-2.0 EM210928500 EM211060200 3 BH01-3.0 EM210928500 EM211060200 0.1 BH02-0.1 EM211060200 0.5 BH02-0.5 EM211060200 DUP07-210521 EM210949801 EM21060200 DUP08-210521 M21-My47278 DUP08-210520 M21-Jn04611 0.5 BH03-0.5 EM210949801 1 BH03-1.0 EM210949801 2 BH03-1.0 EM210949801 2 BH03-2.0 EM210949801 1 BH03-1.0 EM210949801 1 BH03-1.0 EM210949801 1 BH03-1.0 EM210949801 1 BH08-1.0 EM21060200 0.1 BH09-0.1 EM211060201 0.1 BH09-0.1 EM211060201 0.1 BH11-0.1 EM210949800 EM211060201 1 BH11-0.5 EM210949800 EM211060201 1 BH11-0.5 EM210949800 EM211060201 1 BH11-0.5 EM210949800 EM211060201 2 BH11-2.0 EM210949800 EM211060201 2 BH11-2.0 EM210949800 EM211060201 3 BH11-3.0 EM210949800 EM211060201 2 BH17-0.1 EM210949800 EM211060201 3 BH17-0.1 EM210949800 EM211060201 0.1 BH17-0.1 EM210949800 EM211060201 1 BH17-0.1 EM210949800 EM211060201 0.1 BH18-0.1 EM210949800 EM211060201 0.1 BH18-0.1 EM210949800 EM211060201 0.1 BH18-0.1 EM210949800 EM211060201 0.1 BH18-0.1 EM210949801 EM211060202 DUP09-210521 EM210949801 EM211060202 DUP09-210521 EM210949801 EM211060202 DUP09-210520 M21-Jn04610 EM21094800 EM211060202 DUP09-210520 EM210939203 EM211060202 DUP05-210520 EM210939203 EM211060202			0.4	3.2	47	-	-	6.1	_		_	-	_	_	_	-	_	_	<u> </u>	_
		B-sd-n-0.4 B-cl-n-0.4 B-cl-n-0.4 B-cl-n-0.4 B-cl-n-0.4 D.1 D.5 1 D.1	BH17.1.0						1			6.1				2	-					1	
		—	BH17-1.0				1				+	0.1					1	_		_		-	
					19/05/2021		91		-		-		-		-	1	-		-		-		
		2	BH17-2.0						-	-	6.2 4.3 2		-										
				EM2110602021	21/05/2021	1.4	6.1	383	-	-	6.4	5.9 -	-										
		3	BH17-3.0	EM2109498020	21/05/2021	2021 2.3 8.7 150 2021 - - - 2021 1.5 4.8 185 2021 - - - 2021 - - - 2021 0.4 3.2 47 2021 - - - 2021 1.6 10.6 91 2021 - - - 2021 1.4 6.1 383 2021 - - - 2021 1.8 8.3 503	-	-	-	-	6.2	4.2	-	-	2	-	-	-	-			-	
				EM2110602022	21/05/2021	1.8	8.3	503	-	-	6.9	-	-	-	-	-	-	-	-	-	-	-	-
			DUP09-210521	EM2109498021		-	-	-	-	-	-	6.7	4.9	-	-	3	-	-	-	-	-	-	-
						1.8		480	_	-	+	1		-		-	-	_		_	-	1 -	_
			DI ID10-210521	EM2110602021 2 EM2109498020 2 EM2110602022 2 521 EM2109498021 2 EM2110602069 2 521 M21-My47279 2				50	<u> </u>	_				 _		<u> </u>	1					 	
				-							+	1		 		 	-	 		 		 	
						 		-		-				-		-	-	-		-		-	
BH18	G-cl-y-0.4	0.1				-	-	-	-	-	-	1		-	-	3	 -	-	-	-	-	-	-
		0.5				-	-	-	-	-	-	5.4		-	-	2	-	-	-	-	-	<u> </u>	-
		1	BH18-1.0	EM2109285044	19/05/2021	-	-	-	- - 6.6 -<														
		2	BH18-2.0	EM2109285045	19/05/2021	-	-	-	-	-	-	6.5	- -										
		3				-	-	-	-	-	-	₩		-	-	1	-	-	-	-	-	1 -	-
RH19	G-cl-y-0 4	0.1				<u> </u>		_		_		1		1 -		3	1	_		_		1 -	
5.113	S 61-y-0.4		51115-0.1						1		<u> </u>	1		1			-						
1			DU140 0 5			- 						 				-						-	
		0.5	BH19-0.5			_			5.4 3.0 3 3														
						0.4	2.8	77	-	-	6.0												
			DUP05-210520				<u> </u>		-	-		6.1	3.5	-	-	2							
				EM2110602067	20/05/2021	0.5	3.0	85	-	-	6.1	-	-	-	-	-	-	-	-	-		-	
			DUDO6 210E20						-	-		-	-	-	-								
			DOLOG 510250			 -	1																
			D0P06_210320	M21-Mv45986	[20/05//07/		1	103															
	G-cl-y-0.4 0.1 0.5 BH18-0.1 0.5 BH18-1.0 BH18-2.0 BH18-3.0 G-cl-y-0.4 0.1 BH19-0.1 0.5 BH19-0.5 DUP05-210520 DUP06_210520 BH19-1.0	<u> </u>								67	_ E O	1								ll .			
	BH19 G-cl-y-0.4	1		EM2109392033	20/05/2021	-					<u> </u>	6.7					1			-		-	
		1	BH19-1.0	EM2109392033 EM2110602025	20/05/2021 19/05/2021	-		526			<u> </u>	-	-				1			-		-	
	1 2	BH19-1.0	EM2109392033 EM2110602025 EM2109392034	20/05/2021 19/05/2021 20/05/2021	- 1.3 -	6.9	526 -	-	-	7.2	-	-	-	-		-	-	-	-	-	-	-	



-								A cid S	ulmhata Sails E	iold			Asid Culph	nata Sails As	idity Trail		Acid Cul	nhata	
	e Sodium		(Lab)	gnesium	Potassiu		H test)*	Acid 5	ulphate Soils - F	*sgui	o o	tual ır units)	roxide ir units)	lfidic rr units)	le Trail	lfidic	et ity Units)	et ur Units)	s Factor
	Exchangeable	CEC	Electrical Conductivity	Calcium/Mag Ratio	Magnesium/ m Ratio	рн (Lab)	pH-F (Field p	рНFох	хо-на	Reaction Rat	Reaction Rat	Titratable Ac Acidity (sulfu	Titratable Pe Acidity (sulfu	Titratable Su Acidity (sulfu	Titratable Ac Acidity	Titratable Su Acidity	CRS Suite - N Acidity (Acidi	CRS Suite - N Acidity (Sulfu	ANC Finenes
	meq/100g m	neq/100g	μS/cm	No unit	-	pH Unit	PH UNITS	PH UNITS	pH Units CO	OMMENT	mg/kg	%S	%S	% pyrite S	mole H+/t	mole H+/t	MOL H+/T	% S	-
EQL	0.1	0.1	1	0.2		0.1	0.1	0.1	0.1		1	0.003	0.02	0.02	2	2	10	0.02	0.5

Location Cor	de Soil Profile	Depth Avg	Field ID	Sample Code	Date																		
T		2	BH19-3.0	EM2109392035	20/05/2021	_	_	_	_	_	_	7.1	5.7	Τ -		7	_	T -	_	_	T -	_	T _
BH21	G-cl-n-0.4	0.5	BH21-0.5	EM2110602027	19/05/2021	1.0	9.1	66	_	_	5.6	-	-	<u> </u>	_	-	_	 -	_	_	 -	 	_
DITE	G CI-II-0.4	1	BH21-1.0	EM2110602028	19/05/2021	1.1	7.2	83	-	_	5.9	_	-	 -	-	_	_	_	-	-	 -	-	_
		2	BH21-2.0	EM2110602029	19/05/2021	0.9	3.3	358	_	_	6.3	_	_	<u> </u>	_	_	_		-	_	 -	 	_
BH22	B-cl-n-0.4	0.5	BH22-0.5	EM2110602030	21/05/2021	0.6	6.1	54	_	_	5.8	<u> </u>	_		_		_	_	_	_	-	 	_
BITEE	D-CI-11-0.4	1	BH22-1.0	EM2110602031	21/05/2021	1.9	10.3	228	_	_	5.8	<u> </u>	_	_	_	_	_	_	_	_	-	-	_
		2	BH22-2.0	EM2110602032	21/05/2021	1.3	8.5	514	_	_	6.7	_	_	-	_	_	_	_	_	_	-	_	_
BH24	B-cl-y-0.4	0.5	BH24-0.5	EM2110602032	19/05/2021	1.6	11.1	128	-		6.4	 	-	 	-	-	-	-	-	-	 -	 	
BH24	B-CI-y-0.4	1	BH24-1.0	EM2110602034	19/05/2021	2.9	15.0	224	_		6.0	 	_	 	_	 		-	_	-	 	 	-
		2	BH24-2.0	EM2110602035	19/05/2021	3.5	11.8	205	-		6.0	 	-	 	-	-	-	-	-	-	 	 	
BH25	G-sd-n-0.4	0.1	BH25-0.1	EM2109285062	19/05/2021	- 3.5	-	-	_		-	5.9	2.6	 	_	3		-	-	-	 	 	-
БП23	G-3u-11-0.4	0.1	BH25-0.1	EM2110602036	19/05/2021	0.3	7.2	72	_		5.6	5.9	-	 	-	-	-	-	-	-	 -	 	-
		0.5	BH25-0.5	EM2109285063	19/05/2021	- 0.3	-	-	-	-	-	6.2	4.5	-	-	2	-	-	-	-	+ -	 	
		0.5	БП23-0.3	EM2110602037	19/05/2021	0.3	2.0	56	_		5.8	0.2	-	 	_	-			_		 	 	-
		1	BH25-1.0	EM2109285064	19/05/2021	- 0.5	-	-	_		-	6.2	4.9	 	_	1		-	-	-	+	 	_
		l l	B1123-1.0	EM2110602038	19/05/2021	3.3	11.2	293	_	_	6.7	0.2	-	_	_	-	_	-	_	_	_	-	_
		2	BH25-2.0	EM2109285065	19/05/2021	- 3.3	-	-	_		-	6.6	5.5	-	_	1	-	-	-	-	-	-	-
		 	B1123-2.0	EM2110602039	19/05/2021	1.3	5.8	411	_		7.2	- 0.0	-	 	_	-		-	_	-	-	 	_
BH26	B-cl-y-0.4	0.5	BH26-0.5	EM2110602040	20/05/2021	0.2	2.0	64	_	_	7.2	_	_	 -	_	_			_	_	 	 	_
51120	D C. Y O.4	1	BH26-1.0	EM2110602041	20/05/2021	3.4	13.0	234	0.4	29.3	7.5	_	_	 -	_	_	_	_	-	-	 -	-	_
		2	BH26-2.0	EM2110602042	20/05/2021	2.9	9.3	284	0.4	-	8.1	_	-	_	-	_	_	_	-	_	_	<u> </u>	_
BH28	G-cl-n-<0.3	0.1	BH28-0.1	EM2109607034	24/05/2021	-	-	-	-	_	-	5.5	3.9	-	-	4	_	_	-		-	 -	 -
5.1.20	G 61 11 40.5		5.120 0.12	EM2110602043	24/05/2021	-	-	-	_	-	-	-	-	-	-	-	0.02	-	-	14	-	 -	-
		0.5	BH28-0.5	EM2109607035	24/05/2021	-	-	-	_	-	_	5.7	4.0	-	-	4	-	-	-	-	-	 -	-
				EM2110602044	24/05/2021	0.8	6.3	113	-	-	5.9	-	-	-	-	-	0.02	-	-	16	-	 -	-
		1	BH28-1.0	EM2109607036	24/05/2021	-	-	-	-	-	-	5.8	4.1	-	-	2	-	-	-	-	-	<u> </u>	-
				EM2110602045	24/05/2021	0.9	6.7	120	-	-	5.5	-	-	-	-	-	0.03	-	-	17	-	-	-
		2	BH28-2.0	EM2109607037	24/05/2021	-	-	-	-	-	-	5.4	4.2	-	-	1	-	-	-	-	-	-	-
				EM2110602046	24/05/2021	0.9	7.0	115	-	-	5.5	-	-	-	-	-	0.03	-	-	16	-	1 -	-
		3	BH28-3.0	EM2109607038	24/05/2021	-	-	-	-	-	-	4.8	3.4	-	-	1	-	-	-	-	-	-	-
				EM2110602047	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	0.03	-	-	22	-	-	-
BH29	B-sd-n-0.4	0.1	BH29-0.1	EM2109285053	19/05/2021	-	-	-	-	-	-	5.9	2.7	-	-	3	-	-	-	-	-	-	-
		0.5	BH29-0.5	EM2109285054	19/05/2021	-	-	-	-	-	-	6.2	3.7	-	-	3	-	-	-	-	-	-	-
		1	BH29-1.0	EM2109285055	19/05/2021	-	-	-	-	-	-	6.2	4.7	-	-	3	-	-	-	-	-	-	-
		2	BH29-2.0	EM2109285056	19/05/2021	-	-	-	-	-	-	6.2	5.6	-	-	1	-	-	-	-	-	-	-
		3	BH29-3.0	EM2109285057	19/05/2021	-	-	-	-	-	-	6.5	5.8	-	-	2	-	-	-	-	-	-	-
ВН30	G-cl-y-0.4	0.1	BH30-0.1	EM2109392001	20/05/2021	-	-	-	-	•	-	5.4	3.5	-	-	1	-	-	-	-	-	-	-
		0.5	BH30-0.5	EM2109392002	20/05/2021	-	-	-	-	•	-	5.2	3.6	-	-	2	-	-	-	-	-	-	-
		1	BH30-1.0	EM2109392003	20/05/2021	-	-	-	-	-	-	6.0	4.9	-	-	1	-	-	-	-	-		-
		2	BH30-2.0	EM2109392004	20/05/2021	-	-	-	-	-	-	6.8	5.7	-	-	1	-	-	-	_	-		-
		3	BH30-3.0	EM2109392005	20/05/2021	-	-	-	-	-	-	7.1	6.0	-	-	2	-	-	-	-	-	-	-
BH32	G-cl-y-0.4	0.1	BH32-0.1	EM2109392021	20/05/2021	-	-	-	-	-	-	5.2	2.8	-	-	3	-	-	-	-	-	-	-
				EM2110602048	20/05/2021	0.3	2.4	55	-	-	5.4	-	-	-	-	-	-	-	-	-	-	-	-
		0.5	ВН32-0.5	EM2109392022	20/05/2021	-	-	-	-	-	-	6.1	4.3	-	-	2	-	-	-	-	-	-	-
				EM2110602049	20/05/2021	0.4	1.8	50	-	-	6.1	-	-	-	-	-	-	-	-	-	-	-	-
		1	BH32-1.0	EM2109392023	20/05/2021	-	-	-	-	-	-	7.4	5.7	-	-	1	-	-	-	-	-	-	-
				EM2110602050	20/05/2021	3.3	11.1	295	0.2	-	7.4	-	-	-	-	-	-	-	-	-	-	-	-
		2	BH32-2.0	EM2109392024	20/05/2021	- 47	-	-	-	-	-	7.5	5.6	-	-	1 1	-	-	-	-	-	-	-
			DU100 5 5	EM2110602051	20/05/2021	4.7	14.0	310	<0.2	28.1	7.6		-	-	-	-	-	-	-	-	-	-	-
DI:00	0.1.05	3	BH32-3.0	EM2109392025	20/05/2021	-	-	-	-	-	-	7.7	5.7	-	-	1	-	-	-	-	-	-	-
ВН33	G-sd-y-0.4	0.1	BH33-0.1	EM2109392026	20/05/2021	-	-	-	-	-	-	6.0	3.8	-	-	3		-	-	-	-	-	-
		0.5	DU33 O F	EM2110602052	20/05/2021	-	-	-	-	-	-	- 6.0	2 7	-	-	- 2	<0.02	-	-	- 5	-	-	-
		0.5	BH33-0.5	EM2109392027	20/05/2021	- 0.2	2.1	- 21	-	-	- 6.6	6.0	3.7	- 5 1	-	3	- -0.020	<0.020	<0.020	-		-	-
				EM2110602053	20/05/2021	0.2	2.1	31	-	-	6.6	-	-	5.1	-	-	<0.020	<0.020	<0.020	5	<2	-	-
		1	BU22 1 0	EM2109392028	20/05/2021	-	-	-	-	-	-	7 1	- 5.0	+ -	-	2	-	-	-	-	-	-	-
		1	BH33-1.0	EM2109392028 EM2110602054	20/05/2021	2.5	11.7	210	-	-	5.9	7.1	5.0	-	-		<0.02	 	-	- 5	-	-	-
		2	BH33.3.0	EM2109392029	20/05/2021	2.5		210	-	<u>-</u>	 	6.0	4.8	- -	-	1	10.00	-	-	5	-	 	-
		4	BH33-2.0	EM2110602055	20/05/2021	3.2	14.8	- 178	-	-	6.0	5.0	4.8	 -	-	_	<0.02	-	-	12	-	-	-
				EM2109392030	20/05/2021	3.2	14.8		-			6.2	5.0	 		1	<0.02 -	 		12	+	-	+ -
		3	BH33-3 U		<u>- U </u>		-			-	_	5.9	4.1	+ -	-	1	-	-	-	-	-	-	-
RH3/I	G-c4-v->0 E	3	BH33-3.0 BH34-0.1		24/05/2021	_	-	-		-						ı +				_			
ВН34	G-sd-y->0.5	3 0.1 0.5	BH34-0.1	EM2109607024	24/05/2021		-		-		1	1		_	_	Л	_	_				 	
ВН34	G-sd-y->0.5	3 0.1 0.5	BH34-0.1 BH34-0.5	EM2109607024 EM2109607025	24/05/2021	-	-	-	-	-	-	7.5	5.3	-	-	4	-	-	-	-	-	-	-
ВН34	G-sd-y->0.5		BH34-0.1	EM2109607024							1	1				2	-		-	-		-	-

Acid Sulphate

Acid Sulphate Soils - Field

Acid Sulphate Soils - Acidity Trail



							Exchangeable Sodium	CEC	Electrical Conductivity (Lab)	Calcium/Magnesium Ratio	Magnesium/Potassiu m Ratio	рн (Lab)	pH-F (Field pH test)*	рНFох	хо-на	Reaction Ratings*	Reaction Rate	Titratable Actual Acidity (sulfur units)	Titratable Peroxide Acidity (sulfur units)	Titratable Sulfidic Acidity (sulfur units)	Titratable Actual Acidity	Titratable Sulfidic Acidity	CRS Suite - Net Acidity (Acidity Units)	CRS Suite - Net Acidity (Sulfur Units)	ANC Fineness Factor
-							meq/100g	† 	μS/cm	No unit	-	pH Unit	PH UNITS	PH UNITS	+ -	COMMENT	mg/kg	%S	%S		mole H+/t	mole H+/t	MOL H+/T	% S	-
EQL							0.1	0.1	1	0.2		0.1	0.1	0.1	0.1		1	0.003	0.02	0.02	2	2	10	0.02	0.5
Site ID	Location Code	Soil Profile	Depth Avg	Field ID	Sample Code	Date																			
Site ib	ВН36	B-cl-n-0.4	0.1	BH36-0.1	EM2109607006	24/05/2021	_	T -		Ι -	_	_	6.2	4.4			<u> </u>	_	-	_	_	_	_	_ [_
	ВПЗО	B-CI-II-0.4	0.5	BH36-0.5	EM2109607007	24/05/2021	 	-	-	-		-	5.9	4.4	 	-	4	-		_	_			-	
			0.5	51.50 0.5	EM2110602056	24/05/2021	1.4	12.1	138	-	_	6.0	-	-	-	-	-	_	-	-	-	-	_	_	_
			1	BH36-1.0	EM2109607008	24/05/2021	-	-	-	-	-	-	6.0	4.6	-	-	2	-	-	-	-	-	-	-	_
					EM2110602057	24/05/2021	1.5	10.5	553	-	-	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-
			2	BH36-2.0	EM2109607009	24/05/2021	-	-	-	-	-	-	6.5	5.6	-	-	2	-	-	-	-	-	-	-	-
					EM2110602058	24/05/2021	1.8	9.9	892	-	-	6.7	-	-	-	-	-	-	-	-	-	-	-	-	-
			3	вн36-3.0	EM2109607010	24/05/2021	-	-	-	-	-	-	6.7	5.6	-	-	2	-	-	-	-	-	-	-	-
					EM2110602059	24/05/2021	1.0	6.0	671	-	-	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-
	ВН39	G-cl-n-0.4	0.1	BH39-0.1	EM2109285028	19/05/2021	-	-	-	-	-	-	5.1	2.5	-	-	3	-	-	-	-	-	-	-	-
			0.5	BH39-0.5	EM2109285029	19/05/2021	-	-	-	-	-	-	5.5	4.1	-	-	3	-	-	-	-	-	-	-	-
			1 2	BH39-1.0	EM2109285030	19/05/2021	-	-	-	-	-	-	5.3	3.9	-	-	2	-	-	-	-	-	-	-	-
	BU40	C ad n 40.2	0.1	BH39-2.0	EM2109285031	19/05/2021	-	-	-	-	-	-	5.5	4.2	-	-	2	-	-	-	-	-	-	-	<u> </u>
	BH40	G-sd-n-<0.3	0.1	BH40-0.1 BH40-0.5	EM2109285015 EM2109285016	19/05/2021 19/05/2021	-	-	-	-	-	-	7.2 6.9	3.2 5.0	-	-	2	-	-	-	-	-	-	-	-
			1	BH40-1.0	EM2109285017	19/05/2021	 -	-	_	-	_	-	7.9	6.2		-	2	_		_	_		_	_	_
			2	BH40-2.0	EM2109285018	19/05/2021	_	-	_	_	_	_	7.7	6.6	_	_	3	_	_	_	_	_	_	_	_
			3	BH40-3.0	EM2109285019	19/05/2021	-	-	-	-	-	-	7.6	5.6	-	-	2	_	-	-	-	-	-	_	_
	BH41	B-sd-n-0.4	0.1	BH41-0.1	EM2109285006	19/05/2021	-	-	-	-	-	-	7.3	5.5	-	-	1	-	-	-	-	-	-	-	-
			0.5	BH41-0.5	EM2109285007	19/05/2021	-	-	-	-	-	-	8.1	5.0	-	-	1	-	-	-	-	-	-	,	-
					EM2110602060	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	< 0.02	-	-	6	-	-	-	1.5
			1	BH41-1.0	EM2109285008	19/05/2021	-	-	-	-	-	-	6.8	4.1	-	-	3	-	-	-	-	-	-	-	-
					EM2110602061	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	< 0.02	-	-	<2	-	-	-	1.5
			2	BH41-2.0	EM2109285009	19/05/2021	-	-	-	-	-	-	7.5	5.6	-	-	1	-	-	-	-	-	-	-	-
			3	BH41-3.0	EM2109285010	19/05/2021	-	-	-	-	-	-	7.5	5.4	-	-	2	-	-	-	-	-	-	-	-
					EM2110602062	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.02	-	-	<2	-	-	-	1.5
	BH42	G-cl-n-0.4	0.1	BH42-0.1	EM2109607001	24/05/2021	-	-	-	-	-	-	5.7	4.1	-	-	4	-	-	-	-	-	-	-	-
			0.5	BH42-0.5	EM2109607002	24/05/2021	-	-	-	-	-	-	6.2	4.1	-	-	3	-	-	-	-	-	-	-	
			1	BH42-1.0	EM2109607003	24/05/2021	-	-	-	-	-	-	6.4	4.7 4.5	-	-	2	-	-	-	-	-	-	-	-
			2	BH42-2.0 BH42-3.0	EM2109607004 EM2109607005	24/05/2021 24/05/2021	-	-	-	-	-	-	5.6 5.7	4.5	-	-	2	-	-	-	-	-	-	-	-
	ВН43	G-cl-n-0.4	0.1	BH43-0.1	EM2109498034	21/05/2021	-	-	-	-		-	5.5	2.5	-	-	3	-		-		-		-	-
	5,145	J 61 11 0.4	0.5	BH43-0.5	EM2109498035	21/05/2021	 -	-	-	-	-	-	6.4	4.1	-	_	2	_	-	-	-	-	-	-	
			1	BH43-1.0	EM2109498036	21/05/2021	-	-	-	-	-	-	7.0	4.3	-	-	2	-	-	-	-	-	-	-	-
			2	BH43-2.0	EM2109498037	21/05/2021	-	-	-	-	-	-	7.1	5.2	-	-	1	-	-	-	-	-	-	-	-
			3	BH43-3.0	EM2109498038	21/05/2021	-	-	-	-	-	-	7.3	5.6	-	-	1	-	-	-	-	-	-	-	-
	ВН44	G-cl-n-<0.3	0.1	BH44-0.1	EM2109607015	24/05/2021	-	-	-	-	-	-	6.0	4.0	-	-	3	-	-	-	-	-	-	-	-
					EM2110602063	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	16	-	-	-	1.5
			0.5	BH44-0.5	EM2109607016	24/05/2021	-	-	-	-	-	-	6.0	4.2	-	-	2	-	-	-	-	-	-	-	
			1	BH44-1.0	EM2109607017	24/05/2021	-	-	-	-	-	-	5.3	3.7	-	-	2	- 0.02	-	-	- 16	-	-	-	- 1 F
			2	BH44-2.0	EM2110602064 EM2109607018	24/05/2021 24/05/2021	-	-	-	-	-	-	4.9	3.8	-	-	- 2	0.02	-	-	16	-	-	-	1.5
			· ·	DП 44 -2.U	EM2109607018 EM2110602065	24/05/2021	-	-	-	-	_	-	4.9	3.8	-	-		0.02	-	-	- 15	-		-	1.5
			3	BH44-3.0	EM2109607019	24/05/2021	-	-	-	-	-	-	4.7	3.8	-	-	2	- 0.02	-	-	-	-		-	-
			Ť	34	EM2110602066	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	<0.02	_	-	8	-	-	-	1.5
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Statistics																									
Number of Resul	ts						55	55	55	11	5	55	104	104	1	3	101	24	1	1	25	1	1	1	25
Minimum Detect							0.2	1.8	31	0.2	23.2	5.2	4.7	2.3	5.1	2	1	0.02	ND	ND	3	ND	36	0.06	1.5
Maximum Conce							5	17.5	1,120	0.4	39.6	8.3	8.1	8	5.1	4	4	0.07	<0.02	<0.02	43	<2	36	0.06	1.5
Average Concent	ration *						1.7	8.4	253	0.26	29	6.5	6.3	4.5		3	2.1	0.024			15			,	1.5
95% UCL (Studen							1.971	9.337	304.3	0.32	35.08	6.664	6.459	4.658		4.686	2.297	0.0302			18.96			,	1.5
% of Detects							100	100	100	82	100	100	100	100	100	100	100	62	0	0	92	0	100	100	100
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* A Non Detect M									<u> </u>				11		•		<u>. </u>	1	<u> </u>				I <u> </u>		

^{*} A Non Detect Multiplier of 0.5 has been applied.

Soil Profile Notes:

G: Grey colour

B: Brown colour

cl: Predominantly clay to depth sd: Sand layer encountered at depth

n: No silt layer above clay y: Silt layer above clay



	Acid	d Sulphate S	oils - Acid Bas	se Accountin	g			SPO	CAS		Acid	d Sulphate So	oils - Sulfur Tr	ail		Acid Sulphate	Soils - Calc	ium Values		
Net The Control of th	units)	Net Acidity (acidity units)	Liming Rate	a-Net Acidity without ANCE	s-Net Acidity without ANCE	Liming Rate excluding	CRS Suite - Liming Rate	HCI Extractable Sulfur Correction Factor	рн (КСІ)	Titratable Peroxide Acidity	Peroxide Oxidisable Sulfur (acidity units)	KCI Extractable Sulfur	Peroxide Oxidisable Sulfur	Peroxide Sulfur	Acid Reacted Calcium	acidity - Acid Reacted Calcium	Calcium in Peroxide	KCI Extractable Calcium	sulfidic - Acid Reacted Calcium_	
9	%S n	nole H+/t	kg CaCO3/t r	moles H+/t	%w/w S	kg CaCO3/t	KG CACO3/T	FACTOR	pH Units	mole H+/T	mole H+/t	%	%	%	%	mole H+/t	%	%	% S	
0	0.02	10	1	10	0.02		1	1	0.1	2	10	0.02	0.02	0.02	0.02	10	0.02	0.02	0.02	

	de Soil Profile	Depth Avg	Field ID	Sample Code	Date																		
				_ `		Т .					<u> </u>												
BH01	B-sd-n-0.4	0.1	BH01-0.1	EM2109285001	19/05/2021	-	-	-	-		-	-	-	-	-	-	-	-	-		-	+ -	-
		0.5	BH01-0.5	EM2109285002	19/05/2021	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-		-
				EM2110602001	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1	BH01-1.0	EM2109285003	19/05/2021	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602002	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2	BH01-2.0	EM2109285004		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602003		 		_	+			_	_	_	_	_	_	-		_	-	+ -	_
		2	BH01-3.0																		+	+	
		3	ВПОТ-3.0					-		-			-	-			-	-	-		-	-	-
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BH02	B-cl-n-0.4	0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		0.5	BH02-0.5	EM2110602006	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1	BH02-1.0	EM2110602007	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ВН03	B-cl-n-0.4	0.1	BH03-0.1	EM2109498010	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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			DUP08_210520	M21-Jn04611	21/05/2021	-	-	-	-	-	-	2.7	2.0	4.9	-	-	-	-	-	-	-		-
		0.5	BH03-0.5	EM2109498011	21/05/2021	-	-	-	-	<u> </u>	-	-	-	-	-	-	-	-	-	-	-	-	-
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BH11	B-sd-n-0.4	0.1	BH11-0.1	EM2109498001	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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		3	BH11-3.0	EM2109498005	21/05/2021	-	-	-	_	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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BH18	G-cl-y-0.4		DUP09-210521 DUP10-210521 DUP10_210520 BH18-0.1 BH18-0.5	EM2110602021 EM2109498020 EM2110602022 EM2109498021 EM2110602069 M21-My47279 M21-Jn04612 EM2109285042 EM2109285043	21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 19/05/2021 19/05/2021	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - -	- - - - - - - -	- - - - - -	- - - - - - -	- - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - - -	- - - - - - -	- - - - - - - -	- - - - -	- - - - - - - -
BH18	G-cl-y-0.4		DUP10-210521 DUP10-210521 DUP10_210520 BH18-0.1 BH18-0.5 BH18-1.0	EM2110602021 EM2109498020 EM2110602022 EM2109498021 EM2110602069 M21-My47279 M21-Jn04612 EM2109285042 EM2109285043 EM2109285044	21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 19/05/2021 19/05/2021 19/05/2021	- - - - - - - -	- - - - - - -	- - - - - - -	- - - - - - - -	- - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - -	- - - - - - - - -	- - - - - - - -	- - - - - - -	- - - - - -	- - - - - - -	- - - - - - -	- - - - - - - -	- - - - -	- - - - - - - -
BH18	G-cl-y-0.4		DUP10-210521 DUP10-210521 DUP10_210520 BH18-0.1 BH18-0.5 BH18-1.0 BH18-2.0	EM2110602021 EM2109498020 EM2110602022 EM2109498021 EM2110602069 M21-My47279 M21-Jn04612 EM2109285042 EM2109285043 EM2109285044 EM2109285045	21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 19/05/2021 19/05/2021 19/05/2021 19/05/2021	- - - - - - - - -	- - - - - - - - -	- - - - - - -	- - - - - - - - -	- - - - - - -	- - - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - -	- - - - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - - - - -	- - - - - - -	- - - - - - - -	- - - - -	- - - - - - - -
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BH18 BH19	G-cl-y-0.4 G-cl-y-0.4		DUP10-210521 DUP10-210521 DUP10_210520 BH18-0.1 BH18-0.5 BH18-1.0 BH18-2.0	EM2110602021 EM2109498020 EM2110602022 EM2110602069 M21-My47279 M21-Jn04612 EM2109285042 EM2109285044 EM2109285044 EM2109285045 EM2109285046 EM2109392031	21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 21/05/2021 19/05/2021 19/05/2021 19/05/2021 19/05/2021 19/05/2021 20/05/2021	- - - - - - - - - -	- - - - - - - - -	- - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - - - -	- - - - -	- - - - - - - - - - - - - -
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	А	cid Sulphate S	oils - Acid Bas	se Accountin	g			SPO	CAS		Acid	Sulphate S	oils - Sulfur Tı	ail		Acid Sulphate	e Soils - Calci	ium Values	
	Net Acidity (sulfur units)	이 Net Acidity (acidity + units)	kg CaCO3/t r	saloa Saloa a-Net Acidity without TH ANCE	s-Net Acidity without A ANCE	8 Liming Rate excluding SANC_1	DS CRS Suite - Liming CRS Suite - Liming CRS Suite - Liming CRS CRS CRS CRS CRS CRS CRS CRS CRS CRS	HCI Extractable Sulfur Correction Factor	pH (KCI)	의 자라 Titratable Peroxide 국 Acidity	ollowide Oxidisable H Sulfur (acidity units)	% KCI Extractable Sulfur	Peroxide Oxidisable Sulfur	% Peroxide Sulfur	% Acid Reacted Calcium	acidity - Acid Reacted ++ Calcium	% Calcium in Peroxide	KCI Extractable Calcium	% sulfidic - Acid Reacted % Calcium_
EQL	0.02	10	1	10	0.02		1	1	0.1	2	10	0.02	0.02	0.02	0.02	10	0.02	0.02	0.02

	le Soil Profile	Depth Avg		Sample Code	Date		<u> </u>	Π	T	Ī	T	T 1	<u> </u>	T	T	<u> </u>	T		T .	T	1		_
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BH21	G-cl-n-0.4	0.5	BH21-0.5	EM2110602027	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-
		1	BH21-1.0	EM2110602028	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
		2	BH21-2.0	EM2110602029	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
BH22	B-cl-n-0.4	0.5	BH22-0.5	EM2110602030	21/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
		1	BH22-1.0	EM2110602031	21/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
		2	BH22-2.0	EM2110602032	21/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
BH24	B-cl-y-0.4	0.5	BH24-0.5	EM2110602033	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
	,	1	BH24-1.0	EM2110602034	19/05/2021	-	-	-	-	-	-		-	-	_	-	-	-	-	-	-	-	_
		2	BH24-2.0	EM2110602035	19/05/2021	_	_	_	_	_	-		_	-	_	-	-	-	_	_	_	_	_
BH25	G-sd-n-0.4	0.1	BH25-0.1	EM2109285062	19/05/2021	_	_	_	 -	_	-		_	_	 -	_	 -	-	_	_	_	_	_
B1123	G-3u-11-0.4	0.1	B1125-0.1	EM2110602036	19/05/2021			_			 			_			+			<u> </u>	_		_
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				EM2110602037	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
		1	BH25-1.0	EM2109285064	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
				EM2110602038	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
		2	BH25-2.0	EM2109285065	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
				EM2110602039	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
BH26	B-cl-y-0.4	0.5	BH26-0.5	EM2110602040	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
		1	BH26-1.0	EM2110602041	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
		2	BH26-2.0	EM2110602042	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
BH28	G-cl-n-<0.3	0.1	BH28-0.1	EM2109607034	24/05/2021	_	_	-	_	-	-		-	-	-	-	-	-	-	-	_	-	_
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		1	BH28-1.0	EM2109607036	24/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
				EM2110602045	24/05/2021	0.04	22	2	22	0.04	2		4.8	-	-	-	-	-	-	-	-	-	_
		2	BH28-2.0	EM2109607037	24/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
				EM2110602046	24/05/2021	0.03	21	2	21	0.03	2		4.9	-	-	-	-	-	-	-	-	-	_
		3	BH28-3.0	EM2109607038	24/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
				EM2110602047	24/05/2021	0.04	27	2	27	0.04	2		4.7	-	-	-	-	-	-	-	-	-	
BH29	B-sd-n-0.4	0.1	BH29-0.1	EM2109285053	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
		0.5	BH29-0.5	EM2109285054	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
		1	BH29-1.0	EM2109285055	19/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
		2	BH29-2.0	EM2109285056	19/05/2021	-	_	_	_	_	-		-	-	_	-	-	-	_	_	-	_	_
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ВН30	G-cl-y-0.4	0.1	BH30-0.1	EM2109392001	20/05/2021		_	_	 -		_		-	_	 _	_	 	_	<u> </u>	_	_	_	_
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		2	BH30-2.0	EM2109392004	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
		3	BH30-3.0	EM2109392005	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
BH32	G-cl-y-0.4	0.1	BH32-0.1	EM2109392021	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
				EM2110602048	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
		0.5	BH32-0.5	EM2109392022	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
				EM2110602049	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
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				EM2110602050	20/05/2021	-	-	-	-	-	-		-	-	1 -	-	-	-	-	-	-	-	_
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ВН33	G-sd-y-0.4	0.1	BH33-0.1	EM2109392026	20/05/2021	-	- 10	- 44	- 10	-0.00				-	-	-	-	-	-	-	-	-	_
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				EM2110602053	20/05/2021	0.02	<10	1	<10	0.02	1		5.4	6	<10	<0.020	< 0.020	<0.020	< 0.020	<10	0.024	0.024	1
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		1	BH33-1.0	EM2109392028	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
				EM2110602054	20/05/2021	< 0.02	11	<1	11	< 0.02	<1		5.6	-	-	-	-	-	-	-	-	-	
		2	BH33-2.0	EM2109392029	20/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	_	-	-	-	
				EM2110602055	20/05/2021	0.03	20	1	20	0.03	1		5.0	-	1 -	-	-	-	-	-	-	_	_
		3	BH33-3.0	EM2109392030	20/05/2021	-	-	-	-	-	-			_	 -	_	 -	-	_	 -	_	_	_
BH34	G-sd-y->0.5	0.1	BH34-0.1	EM2109607024	24/05/2021		 -		 		+ -		 -	 _	 _	 _	 _	_	-	 _	_	<u> </u>	_
134	U-3u-y-/U.3			EM2109607025		_	-	-	 	-	+ -	 	+ -	 	 	 	 	_	<u> </u>	+ -	<u> </u>	 	_
		0.5	BH34-0.5		24/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
		1	BH34-1.0	EM2109607026	24/05/2021	-	-	-	-	-	-	- -	-	-	-	-	-	-	-	-	-	-	_
		2	BH34-2.0	EM2109607027	24/05/2021	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	_
1			BH34-3.0	EM2109607028	24/05/2021			_	_	-	-			-	_	_	-	-	II		1		-



	ı	Acid Sulphate S	Soils - Acid B	ase Accountin	ıg			SPO	CAS		Acid	d Sulphate So	oils - Sulfur Tı	rail		Acid Sulphat	e Soils - Calci	um Values	
	% Net Acidity (sulfur ທ units)	Bolom Net Acidity (acidity ++ units)	kg CaCO3/t	a-Net Acidity without	s-Net Acidity without A ANCE	By Liming Rate excluding ANC_1	CRS Suite - Liming ACO3/L	HCI Extractable Sulfur Correction Factor	pH (KCI)	an Titratable Peroxide ++ Acidity	Peroxide Oxidisable ++ Sulfur (acidity units)	% KCl Extractable Sulfur	Peroxide Oxidisable Sulfur	% Peroxide Sulfur	% Acid Reacted Calcium	al acidity - Acid Reacted ++ Calcium	% Calcium in Peroxide	% KCI Extractable Calcium	% sulfidic - Acid Reacted on Calcium_
EQL	0.02	10	1	10	0.02		1	1	0.1	2	10	0.02	0.02	0.02	0.02	10	0.02	0.02	0.02

	ode Soil Profile	Depth Avg	Field ID	Sample Code	Date	 	T	1	T	ī	ī	11	Т	T	ī	П	Г	I	T	П	T	I	
ВН36	B-cl-n-0.4	0.1	BH36-0.1	EM2109607006	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		0.5	BH36-0.5	EM2109607007	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602056	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1	BH36-1.0	EM2109607008	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602057	24/05/2021	_	_	-	_	-	_	-	-	-	-	-	-	_	_	<u> </u>	-	-	-
		2	BH36-2.0	EM2109607009	24/05/2021	_	-	-	-	_	_	_	-	_	-	_	_	_	_	 -	-	-	_
		-	51130-2.0	EM2110602058	24/05/2021	_	<u> </u>	_	1	_	_		_	1					+	+		_	_
			DU26 2 0				-	-	-	-		-		-	-	-	-	-	-	- -	-	-	
		3	ВН36-3.0	EM2109607010	24/05/2021	-	-		-	-	-		-	-	-	-	-	-	-	 	-	-	-
				EM2110602059	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<u> </u>	-	-	-
ВН39	G-cl-n-0.4	0.1	BH39-0.1	EM2109285028	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<u> </u>	-	-	-
		0.5	BH39-0.5	EM2109285029	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1	BH39-1.0	EM2109285030	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2	BH39-2.0	EM2109285031	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH40	G-sd-n-<0.3	0.1	BH40-0.1	EM2109285015	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		0.5	BH40-0.5	EM2109285016	19/05/2021	-	-	-	-	-	_	-	-	-	-	-	-	-	-	_	-	-	-
		1	BH40-1.0	EM2109285017	19/05/2021	-	_	_	-	_	_	_	-	_	_	_	_	_	_	 -	-	-	_
		2	BH40-2.0	EM2109285018	19/05/2021	_	-	_	-	-	_		-		_		_	-	-	 -	_	_	_
		2	BH40-3.0	EM2109285019		_	<u> </u>		<u> </u>	_		-		-		-		-	+	 	-		
D1144	D . d . 0.4	3	_		19/05/2021	-	-	-	-	-	-		-	-	-		-	-	-	 	-	-	-
BH41	B-sd-n-0.4	0.1	BH41-0.1	EM2109285006	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
		0.5	BH41-0.5	EM2109285007	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<u> </u>	-	-	-
				EM2110602060	19/05/2021	0.02	12	<1	12	0.02	<1	-	-	5.5	-	-	-	-	-	-	-	-	-
		1	BH41-1.0	EM2109285008	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602061	19/05/2021	< 0.02	<10	<1	<10	< 0.02	<1	-	-	6.1	-	-	-	-	-	-	-	-	-
		2	BH41-2.0	EM2109285009	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		3	BH41-3.0	EM2109285010	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602062	19/05/2021	< 0.02	<10	<1	<10	< 0.02	<1	_	-	6.1	-	-	_	-	-	_	-	-	_
BH42	G-cl-n-0.4	0.1	BH42-0.1	EM2109607001	24/05/2021	-	-	_	-	-	_	_	-	-	-	_	_	-	_		-	-	_
51142	G ci ii 0.4	0.5	BH42-0.5	EM2109607002	24/05/2021	_	 -	 	<u> </u>	_		<u> </u>	 -	 -	_		_	_	_	 	_	_	_
		1	BH42-1.0	EM2109607003	24/05/2021	_		 		_	_		 	<u> </u>	_			_	_	1	_	_	
		1 2	BH42-2.0	EM2109607004		-	+	-	- -	-	-		-	-		<u> </u>	-	-	-	-	-	-	-
		2			24/05/2021		+		-	-	-		 	-	-	-	-	-	-	 	-	-	
		3	BH42-3.0	EM2109607005	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH43	G-cl-n-0.4	0.1	BH43-0.1	EM2109498034	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		0.5	BH43-0.5	EM2109498035	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1	BH43-1.0	EM2109498036	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		2	BH43-2.0	EM2109498037	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		3	BH43-3.0	EM2109498038	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH44	G-cl-n-<0.3	0.1	BH44-0.1	EM2109607015	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602063	24/05/2021	0.04	24	2	24	0.04	2	_	-	5.0	-	_	-	-	_	_	-	-	_
		0.5	BH44-0.5	EM2109607016	24/05/2021	-	-	-	-	-	-	<u> </u>	-	-	-	_	_	_	_	 -	_	_	_
		1	BH44-1.0	EM2109607017	24/05/2021	_	<u> </u>		1				+	 		╂				-			
		1	DU44-1.0			- 0.04	- 22			- 0.04	-	-	-	4.0	-	-	-	-	-	-	-	-	-
			DU165 2 2	EM2110602064	24/05/2021	0.04	23	 	23	0.04	2	-	-	4.8	-	-	-	-	-	 -	-	-	-
		2	BH44-2.0	EM2109607018	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602065	24/05/2021	0.03	19	1	19	0.03	1	-	-	4.9	-	-	-	-	-	-	-	-	-
		3	BH44-3.0	EM2109607019	24/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				EM2110602066	24/05/2021	0.03	18	1	18	0.03	1	-	-	4.8	-	-	-	-	-	-	-	-	-

Statistics																			
Number of Results	24	24	24	24	24	24	1	1	25	1	1	1	1	1	1	1	1	1	1
Minimum Detect	0.02	10	1	10	0.02	1	2.7	2	4.5	6	ND	ND	ND	ND	ND	ND	0.024	0.024	ND
Maximum Concentration	0.08	50	4	50	0.08	4	2.7	2	6.1	6	<10	<0.02	<0.02	<0.02	<0.02	<10	0.024	0.024	<0.02
Average Concentration *	0.032	20	1.5	20	0.032	1.5			5.1										1
95% UCL (Student's-t) *	0.0381	24.11	1.857	24.11	0.0381	1.857			5.267										1
% of Detects	75	83	71	83	75	71	100	100	100	100	0	0	0	0	0	0	100	100	0
% of Non-Detects	25	17	29	17	25	29	0	0	0	0	100	100	100	100	100	100	0	0	100
	•																		

^{*} A Non Detect Multiplier of 0.5 has been applied.

Soil Profile Notes:

G: Grey colour

B: Brown colour

cl: Predominantly clay to depth sd: Sand layer encountered at depth

n: No silt layer above clay y: Silt layer above clay



	Acid Sulphate	Soils - Magn	esium Values	S	Acid Sulph	nate Soils -
Acid Reacted Magnesium	Acid Reacted Magnesium (acidity units)	KCI Extractable Magnesium	Magnesium in Peroxide	Acid Reacted Magnesium (sulfur units)	Chromium Reducible Sulfur	Chromium Reducible Sulphur (acidity units)
% Mg	mole H+/t	%	%	%S	%S	mole H+/t
0.02	10	0.02	0.02	0.02	0.005	3

8+00.0 5 8+00.0 5 (AM.100280000 2) 19/05/2021	r South	BH01	de Soil Profile B-sd-n-0.4	Depth Avg	Field ID BH01-0.1	Sample Code EM2109285001	Date 19/05/2021	T -	Ι.		_		<u> </u>	T -
1 BHOL-1.0 BHOL-	Journ	Bilot	D-3u-11-0.4					-	-	-	-	-	-	-
1				0.5	BH01-0.5	————		 	-	- -	- -	-	<u> </u>	
BH02 L 2 BH02 L 2					51124 4 2			-	-	-	-	-	-	
Bellet				1	BH01-1.0			-	-	-	-	-	-	
BH09								-	-	-	-	-	-	<u> </u>
BH02				2	BH01-2.0			-	-	-	-	-	-	<u> </u>
BH02 Bst=0.4						EM2110602003	19/05/2021	-	-	-	-	-	-	<u> </u>
Bit Bit				3	BH01-3.0	EM2109285005	19/05/2021	-	-	-	-	-	-	
8402 8 84m0.4 0.1 8402.0.1 EN210020000 19/05/2021						EM2110602004	19/05/2021	-	-	-	-	-	-	
0.5 8892.0.5 8491106/2020 19/65/2021		BH02	B-cl-n-0.4	0.1	BH02-0.1	 		_	_	_	_	_	_	<u> </u>
BH093		51102	D CI 11 0.4							_		<u> </u>	_	
### BH09				0.5				+	-	-	-	-	-	
Depth Dept				1				-	-	-	-	-	-	
Direct 10 10 10 10 10 10 10 1		ВНОЗ	B-cl-n-0.4	0.1	BH03-0.1			-	-	-	-	-	-	
DUPBS_10521 DUPBS_10520 DUPBS_10520 DUPBS_10520 DUPBS_10520 M21_MMS_10520 DUPS_10520 M21_MMS_10520 DUPS_10520 M21_MMS_10520 DUPS_10520 M21_MMS_10520 DUPS_10520 DUPS_105200 DUPS_105200 DUPS_105200 DUPS_105200 DUPS_105200 DUPS_105200 DUPS_								-	-	-	-	-	0.010	< 1
DURPS_10521 M21-M942178 21/05/2021					DUP07-210521	EM2109498015	21/05/2021	-	-	-	-	-	-	
Description						EM2110602068	21/05/2021	-	-	-	-	-	0.017	1
DUMDS 2105-20 M21-M06511 21/05/2021 - - 0.000					DUP08-210521	M21-My47278	21/05/2021	-	-	-	-	-	-	
0.5 8H03-0.5 EM2109488012 21/05/2021					DUP08 210520			-	-	-	_	-	< 0.005	<
1				0.5				_	<u> </u>	_		<u> </u>	_	
BH08				1				 	<u> </u>			_	l -	-
BH08 G-th=0.05 1				1				-	-	-		<u> </u>	-	-
BH08 Gcl+>0.5 1 BH08-1.0 EM2110602010 19/05/2021				2				-	-	-	-	-	-	<u> </u>
BH09 Gcl.y=0.5 0.1 BH09-1.0 EM2110620211 1.05/20211				3				-	-	-	-	-	-	<u> </u>
BH09		ВН08	G-cl-n->0.5	1	BH08-1.0	EM2110602009	19/05/2021	-	-	-	-	-	-	
BH11 B-5d-n-0.4 0.1 BH11-0.1 EM210949801 21/05/2021				2	BH08-2.0	EM2110602010	19/05/2021	-	-	-	-	-	-	
BH11 B-5d-n-0.4 0.1 BH11-0.1 EM210949801 21/05/2021		ВН09	G-cl-v->0.5	0.1	BH09-0.1	EM2110602011	21/05/2021	-	-	-	-	-	-	
BH11			,	1				_	_	_	_	_		.
EM110602015 21/05/2021 - 0.01		DU11	D ad n O 4	0.1					_				-	\vdash
December December		BHII	B-Sa-n-0.4	0.1	BH11-0.1			-	-	-	-	-		
EM2110602015 21/05/2021 0.007								-	-	-	-	-	0.011	<.
BH11-1.0				0.5	BH11-0.5	EM2109498002		-	-	-	-	-	-	<u> </u>
EM2110602016 21/05/2021 -						EM2110602015	21/05/2021	-	-	-	-	-	0.007	< 2
EM2110602016 21/05/2021 -				1	BH11-1.0	EM2109498003		-	-	-	-	-	-	
BH11-2.0 EM2109498004 21/05/2021						FM2110602016		_	_	_	_	_	0.011	<1
EM2110602017 21/05/2021 - - - 0.010				2	DU11 2 0			_	_	_	_	_	0.011	
BH17				2	БП11-2.0			+	-	-			0.010	
EM2110602018 21/05/2021 -				_				-	-	-	-	-	0.010	<1
BH17 BH18 G-cl-y-0.4 O.1 BH17-0.1 EM2109498016 21/05/2021				3	BH11-3.0			-	-	-	-	-	-	
0.5 BH17-0.5 EM2109498017 21/05/2021								-	-	-	-	-	0.010	<′.
EM2110602019 21/05/2021 - - - - - - - -		BH17	G-cl-n-0.4	0.1	BH17-0.1	EM2109498016	21/05/2021	-	-	-	-	-	-	<u> </u>
1				0.5	BH17-0.5	EM2109498017	21/05/2021	-	-	-	-	-	-	
1						EM2110602019	21/05/2021	-	-	-	-	-	-	
EM2110602020 21/05/2021				1	BH17-1.0			-	-	-	_	_	-	Η.
BH18 G-cl-y-0.4 BH18-1.0 EM2109489019 21/05/2021				-	51127 210			<u> </u>		_		<u> </u>	l	
BH18 G-cl-y-0.4 BH18-1.0 EM2109285042 19/05/2021				1	DU17.2.0			 	_		_			\vdash
BH17-3.0 EM2109498020 21/05/2021				2	BH17-2.0			-	-	-	-	-	-	
EM2110602022 21/05/2021 - - - - - - - - -								-	-	-	-	-	-	<u> </u>
DUP09-210521				3	BH17-3.0	EM2109498020	21/05/2021	-	-	-	-	-	-	<u> </u>
EM2110602069 21/05/2021						EM2110602022	21/05/2021	-	-	-	-	-	-	
DUP10-210521 M21-My47279 21/05/2021 - - - - - - - - -					DUP09-210521	EM2109498021	21/05/2021	-	-	-	-	-	-	
DUP10-210521 M21-My47279 21/05/2021 - - - - - - - - -						EM2110602069	21/05/2021	-	-	-	-	-	-	<u> </u>
DUP10_210520 M21-Jn04612 21/05/2021 - - - - - - - - -					DUP10-210521			_	_	_	_	_	_	<u> </u>
BH18 G-cl-y-0.4 0.1 BH18-0.1 EM2109285042 19/05/2021						-								\vdash
D.5 BH18-0.5 EM2109285043 19/05/2021 - - - - - - - - -		D1140		0.4				-	-	-	<u> </u>	-	<u> </u>	
1		BH18	G-cl-y-0.4					-	-	-	-	-	-	<u> </u>
BH19 G-cl-y-0.4 O.1 BH19-0.1 EM2109285045 19/05/2021 - - - - - - - - -				0.5				-	-	-	-	-	-	<u> </u>
BH19 G-cl-y-0.4 BH19 G-cl-y-0.4 DUP05-210520 DUP06_210520 BH19-1.0 BH19-1.0 EM2109285046 BH209392031 BH205/2021 BH2				1	BH18-1.0	EM2109285044	19/05/2021	-	-	-	-	-	-	<u> </u>
BH19 G-cl-y-0.4 0.1 BH19-0.1 EM2109392031 20/05/2021				2	BH18-2.0	EM2109285045	19/05/2021	-	-	-	-	-	-	
BH19 G-cl-y-0.4 0.1 BH19-0.1 EM2109392031 20/05/2021				3	BH18-3.0	EM2109285046		-	-	-	-	-	-	
EM2110602023 19/05/2021		BH19	G-cl-v-0.4	0.1				-	-	-	-	-	-	
0.5 BH19-0.5 EM2109392032 20/05/2021			3., 5.4					 -	<u> </u>	_			_	<u> </u>
EM2110602024 19/05/2021				0.5	DU10 0 F			+	 	 	-	 	 	
DUP05-210520				0.5	PH13-0.2			 	 	-	-	 	-	
EM2110602067 20/05/2021								-	-	-	-	-	-	<u> </u>
DUP06_210520					DUP05-210520			-	-	-	-	-	-	<u> </u>
M21-My45986 20/05/2021						EM2110602067	20/05/2021	-	-		-	-	-	
M21-My45986 20/05/2021					DUP06_210520	M21-Jn04610	20/05/2021	-	-	-	-	-	-	
1 BH19-1.0 EM2109392033 20/05/2021 EM2110602025 19/05/2021					_			-	-	_	_	_	_	
EM2110602025 19/05/2021				1	RH10-1 ∩	<u> </u>		 -	 -	_		1	l -	
				1	21112-110			+	 	 	-		 	
I I I I I I I I I I I I I I I I I I I								 -	 	-	-	<u> </u>	-	
2 BH19-2.0 EM2109392034 20/05/2021				2	BH19-2.0			-	-	-	-	-	-	

PS124554



4	Acid Sulphate	Soils - Magn	esium Value	5	Acid Sulph	nate Soils -
% Acid Reacted Magnesium	Acid Reacted Magnesium (acidity units)	KCI Extractable Magnesium	Magnesium in Peroxide	Acid Reacted % Magnesium (sulfur units)	& Chromium Reducible ഗ Sulfur	Chromium Reducible H Sulphur (acidity units)
∕o ivig	IIIUIE HT/L	/0	/0	/03	/03	IIIUIE H+/t
0.02	10	0.02	0.02	0.02	0.005	3

	ation Code So	oil Profile	Depth Avg	Field ID	Sample Code	Date							
			3	BH19-3.0	EM2109392035	20/05/2021	-	-	-	-	-	-	
BH21	.1 G	6-cl-n-0.4	0.5	BH21-0.5	EM2110602027	19/05/2021	-	-	-	-	-	-	
			1	BH21-1.0	EM2110602028	19/05/2021	-	-	-	-	-	-	
			2	BH21-2.0	EM2110602029	19/05/2021	-	-	-	-	-	-	
BH22	2 R	3-cl-n-0.4	0.5	BH22-0.5	EM2110602030	21/05/2021	_	_	_	_	-	_	\vdash
	-		1	BH22-1.0	EM2110602031	21/05/2021	_	_	_	_	-		+
			2	BH22-2.0	EM2110602032	21/05/2021	 	_	_	_	_		+
BH24		B-cl-y-0.4	0.5	BH24-0.5	EM2110602032	19/05/2021	_	1	_				\vdash
ВП24	4	5-CI-y-U.4	0.5				-	-	-	-	-	<u> </u>	⊢
			1	BH24-1.0	EM2110602034	19/05/2021	-	-	-	-	-		╀
	_		2	BH24-2.0	EM2110602035	19/05/2021	-	-	-	-	-	-	╀
BH25	.5 G	G-sd-n-0.4	0.1	BH25-0.1	EM2109285062	19/05/2021	-	-	-	-	-	-	╄
					EM2110602036	19/05/2021	-	-	-	-	-	-	╄
			0.5	BH25-0.5	EM2109285063	19/05/2021	-	-	-	-	-	-	╙
					EM2110602037	19/05/2021	-	-	-	-	-	-	L
			1	BH25-1.0	EM2109285064	19/05/2021	-	-	-	-	-	-	
					EM2110602038	19/05/2021	-	-	-	-	-	-	
			2	BH25-2.0	EM2109285065	19/05/2021	-	-	-	-	-	-	Г
					EM2110602039	19/05/2021	-	-	-	-	-	-	Г
BH26	26 B	3-cl-y-0.4	0.5	BH26-0.5	EM2110602040	20/05/2021	-	-	-	-	-	-	Т
		,	1	BH26-1.0	EM2110602041	20/05/2021	-	_	-	_	-	_	\vdash
			2	BH26-2.0	EM2110602042	20/05/2021	_	_	_	_	-	_	T
BH28	2	G-cl-n-<0.3	0.1	BH28-0.1	EM2109607034	24/05/2021		-		-	-	_	+
рпис	۰ ا	3-CI-N-<0.5	0.1	БП20-0.1	EM2110602043		+ -	-	-			0.021	⊢
			0.5	DU 20 0 F		24/05/2021	-	-	-	-	-	0.021	╀
			0.5	BH28-0.5	EM2109607035	24/05/2021	-	-	-	-	-	-	╀
					EM2110602044	24/05/2021	-	-	-	-	-	<0.005	╄
			1	BH28-1.0	EM2109607036	24/05/2021	-	-	-	-	-	-	┺
					EM2110602045	24/05/2021	-	-	-	-	-	0.007	上
			2	BH28-2.0	EM2109607037	24/05/2021	-	-	-	-	-	-	
					EM2110602046	24/05/2021	-	-	-	-	-	0.008	
			3	BH28-3.0	EM2109607038	24/05/2021	-	-	-	-	-	-	Г
					EM2110602047	24/05/2021	-	-	-	-	-	0.008	Т
BH29	29 B	3-sd-n-0.4	0.1	BH29-0.1	EM2109285053	19/05/2021	-	-	-	-	-	-	T
			0.5	BH29-0.5	EM2109285054	19/05/2021	-	_	_	-	-	_	T
			1	BH29-1.0	EM2109285055	19/05/2021	_	_	_	_	-	_	\vdash
			2	BH29-2.0	EM2109285056	19/05/2021	 	_	_	_	_	_	╁
			2	BH29-3.0	EM2109285057	19/05/2021		_	_	_	_		╁
BUSC		C al O 4	0.1	BH30-0.1			+ -	-	-	-	-	<u> </u>	╀
ВН30	ا ا	G-cl-y-0.4			EM2109392001	20/05/2021	-	-	-				╀
			0.5	BH30-0.5	EM2109392002	20/05/2021	-	-	-	-	-		╀
			1	BH30-1.0	EM2109392003	20/05/2021	-	-	-	-	-	-	╀
			2	BH30-2.0	EM2109392004	20/05/2021	-	-	-	-	-	-	╙
			3	BH30-3.0	EM2109392005	20/05/2021	-	-	-	-	-	-	上
BH32	,2 G	6-cl-y-0.4	0.1	BH32-0.1	EM2109392021	20/05/2021	-	-	-	-	-	-	
					EM2110602048	20/05/2021	-	-	-	-	-	-	Ĺ
1			0.5	BH32-0.5	EM2109392022	20/05/2021	-	-	-	-	-	-	Γ
					EM2110602049	20/05/2021	-	-	-	-	-	-	Γ
			1	BH32-1.0	EM2109392023	20/05/2021	-	-	-	-	-	-	T
				1	EM2110602050	20/05/2021	-	_	_	-	-	-	T
			2	BH32-2.0	EM2109392024	20/05/2021	_	_	_	_	-	_	+
				5.132-2.0	EM2110602051	20/05/2021	-			-	-	_	+
			2	BH33 3 0			+ -	 	 	-		<u> </u>	╁
	-	2 - 1 - 2 -	3	BH32-3.0	EM2109392025	20/05/2021	 -	-	-	-	-	-	+
ВН33	,3 G	G-sd-y-0.4	0.1	BH33-0.1	EM2109392026	20/05/2021	-	-	-	-	-	-	╀
					EM2110602052	20/05/2021	-	-	-	-	-	0.008	╄
			0.5	ВН33-0.5	EM2109392027	20/05/2021	-	-	-	-	-	-	L
					EM2110602053	20/05/2021	< 0.020	<10	< 0.020	< 0.020	< 0.020	0.014	L
							-	-	-	-	-	-	Ĺ
			1	BH33-1.0	EM2109392028	20/05/2021	-	-	-	-	-	-	Γ
	•				EM2110602054	20/05/2021	-	-	-	-	-	0.009	Τ
			2	BH33-2.0	EM2109392029	20/05/2021	-	-	-	-	-	-	Τ
			14			20/05/2021	-	_	_	_	-	0.014	+
			2		E V ZTT060Z055	, ,	1	1	1	1			1
			2	BH33-3 U	EM2110602055		_	_	_	_	_	_	Т
рцзи	4	S.ed.y >0 F	3	BH33-3.0	EM2109392030	20/05/2021	-	-	-	-	-	-	L
ВН34	4 G	G-sd-y->0.5	3 0.1	BH34-0.1	EM2109392030 EM2109607024	20/05/2021 24/05/2021	-	-	-	-	-	-	
ВН34	4 G	G-sd-y->0.5	3 0.1 0.5	BH34-0.1 BH34-0.5	EM2109392030 EM2109607024 EM2109607025	20/05/2021 24/05/2021 24/05/2021	-	-		-	-	- - -	
ВН34	4 G	G-sd-y->0.5		BH34-0.1	EM2109392030 EM2109607024	20/05/2021 24/05/2021	- - -		- - -	- - -	- - -	- - - -	



	Acid Sulphate	Soils - Magn	esium Values	S	Acid Sulph	nate Soils -
Acid Reacted Magnesium	Acid Reacted Magnesium (acidity units)	KCI Extractable Magnesium	Magnesium in Peroxide	Acid Reacted Magnesium (sulfur units)	Chromium Reducible Sulfur	Chromium Reducible Sulphur (acidity units)
% Mg	mole H+/t	%	%	%S	%S	mole H+/t
0.02	10	0.02	0.02	0.02	0.005	3

 Location Code	Soil Profile	Depth Avg	Field ID	Sample Code	Date							
BH36	B-cl-n-0.4	0.1	BH36-0.1	EM2109607006	24/05/2021	-	-	-	-	-	-	-
		0.5	BH36-0.5	EM2109607007	24/05/2021	-	-	-	-	-	-	-
				EM2110602056	24/05/2021	-	-	-	-	-	-	-
		1	BH36-1.0	EM2109607008	24/05/2021	-	-	-	-	-	-	-
				EM2110602057	24/05/2021	-	-	-	-	-	-	-
		2	BH36-2.0	EM2109607009	24/05/2021	-	-	-	-	-	-	-
				EM2110602058	24/05/2021	-	-	-	-	-	-	-
		3	BH36-3.0	EM2109607010	24/05/2021	-	-	-	-	-	-	-
				EM2110602059	24/05/2021	-	-	-	-	-	-	-
ВН39	G-cl-n-0.4	0.1	BH39-0.1	EM2109285028	19/05/2021	-	-	-	-	-	-	-
		0.5	BH39-0.5	EM2109285029	19/05/2021	-	-	-	-	-	-	-
		1	BH39-1.0	EM2109285030	19/05/2021	-	-	-	-	-	-	-
		2	BH39-2.0	EM2109285031	19/05/2021	-	-	-	-	-	-	-
BH40	G-sd-n-<0.3	0.1	BH40-0.1	EM2109285015	19/05/2021	-	-	-	-	-	-	-
		0.5	BH40-0.5	EM2109285016	19/05/2021	-	-	-	-	-	-	-
		1	BH40-1.0	EM2109285017	19/05/2021	-	-	-	-	-	-	-
		2	BH40-2.0	EM2109285018	19/05/2021	-	-	-	-	-	-	-
		3	BH40-3.0	EM2109285019	19/05/2021	-	-	-	-	-	-	-
BH41	B-sd-n-0.4	0.1	BH41-0.1	EM2109285006	19/05/2021	-	-	-	-	-	-	-
		0.5	BH41-0.5	EM2109285007	19/05/2021	-	-	-	-	-	-	-
				EM2110602060	19/05/2021	-	-	-	-	-	0.010	<10
		1	BH41-1.0	EM2109285008	19/05/2021	-	-	-	-	-	-	-
				EM2110602061	19/05/2021	-	-	-	-	-	< 0.005	<10
		2	BH41-2.0	EM2109285009	19/05/2021	-	-	-	-	-	-	-
		3	BH41-3.0	EM2109285010	19/05/2021	-	-	-	-	-	-	-
				EM2110602062	19/05/2021	-	-	-	-	-	0.008	<10
BH42	G-cl-n-0.4	0.1	BH42-0.1	EM2109607001	24/05/2021	-	-	-	-	-	-	-
		0.5	BH42-0.5	EM2109607002	24/05/2021	-	-	-	-	-	-	-
		1	BH42-1.0	EM2109607003	24/05/2021	-	-	-	-	-	-	-
		2	BH42-2.0	EM2109607004	24/05/2021	-	-	-	-	-	-	-
		3	BH42-3.0	EM2109607005	24/05/2021	-	-	-	-	-	-	-
BH43	G-cl-n-0.4	0.1	BH43-0.1	EM2109498034	21/05/2021	-	-	-	-	-	-	-
		0.5	BH43-0.5	EM2109498035	21/05/2021	-	-	-	-	-	-	-
		1	BH43-1.0	EM2109498036	21/05/2021	-	-	-	-	-	-	-
		2	BH43-2.0	EM2109498037	21/05/2021	-	-	-	-	-	-	-
		3	BH43-3.0	EM2109498038	21/05/2021	-	-	-	-	-	-	-
BH44	G-cl-n-<0.3	0.1	BH44-0.1	EM2109607015	24/05/2021	-	-	-	-	-	-	-
				EM2110602063	24/05/2021	-	-	-	-	-	0.014	<10
		0.5	BH44-0.5	EM2109607016	24/05/2021	-	-	-	-	-	-	-
		1	BH44-1.0	EM2109607017	24/05/2021	-	-	-	-	-	-	-
				EM2110602064	24/05/2021	-	-	-	-	-	0.011	<10
		2	BH44-2.0	EM2109607018	24/05/2021	-	-	-	-	-	-	-
				EM2110602065	24/05/2021	-	-	-	-	-	0.006	<10
		3	BH44-3.0	EM2109607019	24/05/2021	-	-	-	-	-	-	-
				EM2110602066	24/05/2021	-	-	-	-	-	0.016	<10

Statistics								
Number of Results	1	1	1	1	1	1	24	24
Minimum Detect	N	ND	ND	ND	ND	ND	0.006	10
Maximum Concentration	<0.	0.02	<10	<0.02	<0.02	<0.02	0.021	13
Average Concentration *							0.0099	5.4
95% UCL (Student's-t) *							0.0115	6.116
% of Detects	(0	0	0	0	0	88	8
% of Non-Detects	10	.00	100	100	100	100	12	92

^{*} A Non Detect Multiplier of 0.5 has been applied.

Soil Profile Notes:

G: Grey colour

B: Brown colour

cl: Predominantly clay to depth sd: Sand layer encountered at depth

n: No silt layer above clay y: Silt layer above clay

Inorganics

Soil Properties

Particle Size

Acid Sulphate Soils - Field

Field or Interlab Duplicates

EM2110602 BH19-0.5 Soil 19/05/2021 - 2 1 ¹¹ - - 1 ¹² - 1 ¹⁴ - 16.6 - 0.6 0.7 1.3 0.4 0.4 2.8 77	6.0 6.1 2 6.0	1 () () () () () () () () () (6.0 6.1 2 6.0 - - - - -		1 0.1 0 3.6 1 3.5 3 0 3.6		2 2 0 0 2
Lab Report Number Field D Matrix Type Date	6.0 6.1 2 6.0 - - - - - -	77 6 6 10 77 6 6 10 10 10 10 10 10 10 10 10 10 10 10 10	6.0 6.1 2 6.0 - - - - -	- - - - - - 6.0 6.1 2 6.0 6.8	- - - - - 0 3.6 1 3.5 3 0 3.6		- - - - 2 2 0
EM2110602 Soil 19/05/2021 Soil 19/05	6.1 2 6.0 - - - - - - - -	85 6 10 77 6 	6.1 2 6.0 - - - - - -	- - - - - 6.0 6.1 2 6.0 6.8			- - - - 2 2 0
EM2110602 DUPOS-210520 Soil 20/08/2021 - 2 1 ¹⁰ -	6.1 2 6.0 - - - - - - - -	85 6 10 77 6 	6.1 2 6.0 - - - - - -	- - - - - 6.0 6.1 2 6.0 6.8			- - - - 2 2 0
EM2110602 DUPOS-210520 Soil 20/08/2021 - 2 1 ^{1/3} -	2 6.0 - - - - - - -	10 77 6	2 6.0 - - - - - -	- - - - 6.0 6.1 2 6.0 6.8	- - - 0 3.6 1 3.5 3 0 3.6		- - - - 2 2 0
RPD	2 6.0 - - - - - - -	10 77 6	2 6.0 - - - - - -	- - - 6.0 6.1 2 6.0 6.8	0 3.6 1 3.5 3 0 3.6		- - 2 2 0
EM2110602 BH19-0.5 Soil 19/05/2021 - 2 1 ⁶¹ - - 1 ⁶² - 14.3 - 0.7 1.3 0.4 0.4 2.8 77 80029 DUP05_210520 Soil 20/05/2021 4.4 2 - - - - 43 13 - - - - - - -	- - - - - -	77 (- - - - -	6.0 6.1 2 6.0 6.8	- 0 3.6 1 3.5 3 0 3.6		- - 2 2 0
Section Sect	- - - - - -	- - - - - -	- - - - -	6.0 6.1 2 6.0 6.8	- 0 3.6 1 3.5 3 0 3.6		2 2 0
RPD	- - - - -	- - - -	- - - -	6.0 6.1 2 6.0 6.8	0 3.6 1 3.5 3 0 3.6	3.6 - 3.5 - 3 - 3.6 -	2 2 0 2
EM2109392 BH19-0.5 soil 20/05/2021	- - - -	- - - -		6.1 2 6.0 6.8	1 3.5 3 0 3.6	3.5 - 3 - 3.6 -	2 0 2
EM2109392 DUP05-210520 Soil 20/05/2021 - - - - - - - - -	-	- - -		6.0 6.8	3 0 3.6	3 -	0 2
EM2109392 BH19-0.5 Soil 20/05/2021 - - - - - - - - -	-			6.0	0 3.6	3.6 -	2
Top Top	-	-		6.8			
RPD EM2109498 BH03-0.1 soil 21/05/2021	-	-		_	8 3.3	3.3 4.0	_
EM2109498 BH03-0.1 soil 21/05/2021 - <td< th=""><th></th><th></th><th>-</th><th>12</th><th></th><th></th><th>I II</th></td<>			-	12			I II
EM2109498 DUP07-210521 soil 21/05/2021	-			12	2 9	9 -	-
RPD -		-	-	6.2	2 2.3	2.3 -	3
EM2109498 BH03-0.1 soil 21/05/2021 -	-	-	-	6.2	2 3.0	3.0 -	3
Figure F	-	-	-	0	26	26 -	0
RPD -	-	-	-	6.2	2 2.3	2.3 -	3
EM2110602 BH03-0.1 soil 21/05/2021	-	-	-	6.9	9 2.5	2.5 3.0	-
EM2110602 DUP07-210521 soil 21/05/2021	-	-	-	11	1 8	8 -	-
	-	-	-	-	-		-
	-	-	-	-	-		-
RPD	-	-	-	-	-		-
EM2110602 BH03-0.1 soil 21/05/2021	-	-	-	-	-		-
800029 DUP08_210520 soil 21/05/2021 18 200 <0.005 100 <0.1	-	-	-	-	-		-
RPD	-	-	-	-	-		-
EM2109498 BH17-3.0 soil 21/05/2021	-	-	-	6.2	2 4.2	4.2 -	2
EM2109498 DUP09-210521 soil 21/05/2021	-	-	-	6.7	7 4.9	4.9 -	3
RPD	-	-	-	8	15	- 15	40
EM2109498 BH17-3.0 soil 21/05/2021	-	-	-	6.2	2 4.2	4.2 -	2
797669 DUP10-210521 soil 21/05/2021 17	-	-	-	5.8	8 5.0	5.0 2.0	-
RPD	-	-	-	7	17	17 -	-
EM2110602 BH17-3.0 soil 21/05/2021 - 2 1 ^{#5} 1 ^{#6} - 21.7 - 1.0 5.4 0.1 1.8 8.3 503	6.9	503	6.9	-	-		-
EM2110602 DUP09-210521 soil 21/05/2021 - 2 1 ^{#5} 1 ^{#6} - 21.9 - 1.0 5.2 0.1 1.8 8.0 480	6.6	480	6.6	-	-		-
RPD - 0 0 - 1 - 0 4 0 0 4 5	4		4	-	-		-
	6.9	503	6.9	-	_		-
800029 DUP10_210520 soil 21/05/2021 17 2 290 32	-		-	_	-		-
RPD - 0	l II	_	_	_	_		-

Comments

#1 Sandy Loam #2 Dark Gray (10YR 4/1) #3 Light Clay #4 Olive Brown (2.5Y 4/3)

#5 Clay Loam #6 Light Olive Brown (2.5Y 5/3)

^{*}RPDs have only been considered where a concentration is greater than 1 times the EQL.

^{**}Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: (1 - 10 x EQL); 30 (10 - 20 x EQL); 30 (> 20 x EQL))

^{***}Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory



				Acid Sulp	hate Soils -	Acid S	ulphate		Α	cid Sulphate	Soils - Acid B	ase Accountir	g			SPOCAS		Acid Sulpl	hate Soils -
				Titratable Actual Acidity (sulfur units)	Titratable Actual Acidity	CRS Suite - Net Acidity (Acidity Units)	CRS Suite - Net Acidity (Sulfur Units)	ANC Fineness Factor	Net Acidity (sulfur units)	Net Acidity (acidity units)	Liming Rate	a-Net Acidity without ANCE	s-Net Acidity without ANCE	Liming Rate excluding ANC _1	CRS Suite - Liming Rate	HCI Extractable Sulfur Correction Factor	рн (ксі)	Chromium Reducible Sulfur	Chromium Reducible Sulphur (acidity units)
				%S	mole H+/t	MOL H+/T	% S	-	%S	mole H+/t	kg CaCO3/t	moles H+/t	%w/w S	kg CaCO3/t	KG CACO3/T	FACTOR	pH Units	%S	mole H+/t
EQL				0.003	2	10	0.02	0.5	0.02	10	1	10	0.02		1	1	0.1	0.005	3
Lab Report Number	Field ID	Matrix Type	Date																
EM2110602	BH19-0.5	soil	19/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EM2110602	DUP05-210520	soil	20/05/2021	-	-	-	-	-	-	-	-	_	-	-	-	-	-	-	-
RPD	1	1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EM2110602	BH19-0.5	soil	19/05/2021	_	_	-	_	_	_	_	-	_	-	_	-	_	_	_	-
800029	DUP06_210520	soil	20/05/2021	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
RPD	12 0. 00_110010	120	1-0, 00, 1011	-	-	-	-	-	-	-	-	-	_	-	-	-	_	-	-
EM2109392	BH19-0.5	soil	20/05/2021	-	-	-	-	-	-	-	-	_	-	-	-	-	-	-	-
EM2109392	DUP05-210520	soil	20/05/2021	_	-	_	-	_	_	-	-	_	-	-	_	-	_	_	-
RPD	2 0. 00 22020		-0/00/-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EM2109392	BH19-0.5	soil	20/05/2021	-	-	-	-	-	-	-	-	_	-	-	-	-	-	-	-
797539	DUP06_210520	soil	20/05/2021	-	-	-	-	_	-	_	-	_	-	-	-	-	_	_	-
RPD				-	-	-	-	_	-	_	-	_	-	-	-	-	-	-	-
EM2109498	BH03-0.1	soil	21/05/2021	-	-	-	-	_	-	-	-	-	-	-	-	-	-	-	-
EM2109498	DUP07-210521	soil	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD			,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EM2109498	BH03-0.1	soil	21/05/2021	-	-	-	-	_	-	-	-	-	-	-	-	-	-	-	-
797669	DUP08-210521	soil	21/05/2021	_	-	-	_	_	-	-	-	_	-	-	-	-	_	_	-
RPD	20.00 ==00==		,,	_	-	_	_	_	-	-	-	_	-	-	-	_	_	_	-
EM2110602	BH03-0.1	soil	21/05/2021	0.02	16	-	-	1.5	0.04	22	2	22	0.04	2	-	-	5.0	0.010	<10
EM2110602	DUP07-210521	soil	21/05/2021	0.03	18	_	_	1.5	0.04	29	2	29	0.04	2	-	-	4.7	0.017	10
RPD			,	40	12	-	-	0	0	27	0	27	0	0	-	-	6	52	0
EM2110602	BH03-0.1	soil	21/05/2021	0.02	16	-	-	1.5	0.04	22	2	22	0.04	2	-	-	5.0	0.010	<10
800029	DUP08_210520	soil	21/05/2021	0.060	36	36	0.06	1.5	-	-	-	-	-	-	2.7	2.0	4.9	< 0.005	<3
RPD				100	77	-	-	0	-	-	-	-	-	-	-	-	2	67	0
EM2109498	BH17-3.0	soil	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EM2109498	DUP09-210521	soil	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EM2109498	BH17-3.0	soil	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
797669	DUP10-210521	soil	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD		•		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EM2110602	BH17-3.0	soil	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EM2110602	DUP09-210521	soil	21/05/2021	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
RPD	JOI 03-210321	Jon	21/03/2021	-			-		-	-	 				-	-	-	-	-
	BH17-3.0	coil	21 /05 /2021	 					l		+						1		
EM2110602 800029	DUP10_210520	soil soil	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DOLTO_510250	SOII	21/05/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	_	-	-	-	-	-	-	-	_	-	-	_	-	-

Comments

#1 Sandy Loam #2 Dark Gray (10YR 4/1) #3 Light Clay #4 Olive Brown (2.5Y 4/3) #5 Clay Loam

#6 Light Olive Brown (2.5Y 5/3)

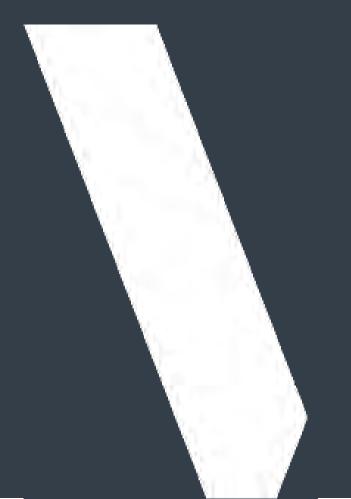
^{*}RPDs have only been considered where a concentration is greater than 1 times the EQL.

^{**}Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier ran

^{***}Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any

APPENDIX E

LABORATORY CERTIFICATES AND CHAIN OF CUSTODY DOCUMENTATION





SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2109285

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact : MR SHANE GILIAM Contact : Graeme Jablonskas

Address : Level 15, 28 Freshwater Place Address : 4 Westall Rd Springvale VIC Australia

3171

 Telephone
 : +61 03 9861 1111
 Telephone
 : +6138549 9609

 Facsimile
 : +61 03 9861 1144
 Facsimile
 : +61-3-8549 9626

Project : PS124554 Page : 1 of 4

SOUTHBANK VIC, AUSTRALIA 3006

 Order number
 : -- Quote number
 : EM2021PARBRIVIC0004 (ME/167/21)

 C-O-C number
 : -- QC Level
 : NEPM 2013 B3 & ALS QC Standard

Site : ----

Sampler : EVAN LISHMUND

Dates

Date Samples Received : 19-May-2021 17:15 Issue Date : 20-May-2021 Client Requested Due : 27-May-2021 Scheduled Reporting Date : 27-May-2021

Date

Delivery Details

 Mode of Delivery
 : Carrier
 Security Seal
 : Not Available

 No. of coolers/boxes
 : 4.8°C - Ice present

Receipt Detail : No. of samples received / analysed : 65 / 33

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 direct any queries related to sample condition / numbering / breakages to Client Services.
- Sample Disposal Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Analytical work for this work order will be conducted at ALS Springvale.
- 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 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.

Issue Date : 20-May-2021

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2 of 4 EM2109285 Amendment 0 Work Order Client : WSP Australia Pty Ltd



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 Sampling date / time Sample ID ID time 5 EM2109285-001 19-May-2021 08:30 BH01-0.1 EM2109285-002 19-May-2021 08:30 BH01-0.5 EM2109285-003 19-May-2021 08:30 BH01-1.0 EM2109285-004 19-May-2021 08:30 BH01-2.0 EM2109285-005 19-May-2021 09:15 BH41-0.1 EM2109285-006 19-May-2021 09:15 BH41-0.5 EM2109285-007 19-May-2021 09:15 BH41-1.0 EM2109285-008 19-May-2021 09:15 BH41-1.0 EM2109285-009 19-May-2021 09:15 BH41-3.0 EM2109285-010 19-May-2021 09:40 BH02-0.1 ✓ EM2109285-011 19-May-2021 09:40 BH02-0.5 ✓ EM2109285-013 19-May-2021 09:40 BH02-1.0 ✓ EM2109285-014 19-May-2021 09:40 BH02-1.0 ✓ EM2109285-014 19-May-2021 09:40 BH02-2.0 ✓	Υ	A03
EM2109285-002 19-May-2021 08:30 BH01-0.5 EM2109285-003 19-May-2021 08:30 BH01-1.0 EM2109285-004 19-May-2021 08:30 BH01-2.0 EM2109285-005 19-May-2021 08:30 BH01-3.0 EM2109285-006 19-May-2021 09:15 BH41-0.1 EM2109285-007 19-May-2021 09:15 BH41-0.5 EM2109285-008 19-May-2021 09:15 BH41-1.0 EM2109285-009 19-May-2021 09:15 BH41-2.0 EM2109285-010 19-May-2021 09:15 BH41-3.0 EM2109285-011 19-May-2021 09:40 BH02-0.1 ✓ EM2109285-012 19-May-2021 09:40 BH02-0.5 ✓ EM2109285-013 19-May-2021 09:40 BH02-1.0 ✓	No analysis req	SOIL - EA037 ASS Field Scree
EM2109285-003 19-May-2021 08:30 BH01-1.0 EM2109285-004 19-May-2021 08:30 BH01-2.0 EM2109285-005 19-May-2021 08:30 BH01-3.0 EM2109285-006 19-May-2021 09:15 BH41-0.1 EM2109285-007 19-May-2021 09:15 BH41-0.5 EM2109285-008 19-May-2021 09:15 BH41-1.0 EM2109285-009 19-May-2021 09:15 BH41-2.0 EM2109285-010 19-May-2021 09:15 BH41-3.0 EM2109285-011 19-May-2021 09:40 BH02-0.1 ✓ EM2109285-012 19-May-2021 09:40 BH02-0.5 ✓ EM2109285-013 19-May-2021 09:40 BH02-1.0 ✓		✓
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EM2109285-010 19-May-2021 09:15 BH41-3.0 EM2109285-011 19-May-2021 09:40 BH02-0.1 ✓ EM2109285-012 19-May-2021 09:40 BH02-0.5 ✓ EM2109285-013 19-May-2021 09:40 BH02-1.0 ✓		✓
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EM2109285-012 19-May-2021 09:40 BH02-0.5 ✓ EM2109285-013 19-May-2021 09:40 BH02-1.0 ✓		✓
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EM2109285-014 19-May-2021 09:40 BH02-2.0 ✓		
EM2109285-015 19-May-2021 10:40 BH40-0.1		✓
EM2109285-016 19-May-2021 10:40 BH40-0.5		✓
EM2109285-017 19-May-2021 10:40 BH40-1.0		✓
EM2109285-018 19-May-2021 10:40 BH40-2.0		✓
EM2109285-019 19-May-2021 10:40 BH40-3.0		✓
EM2109285-020 19-May-2021 12:00 BH05-0.1 ✓		
EM2109285-021 19-May-2021 12:00 BH05-0.5 ✓		
EM2109285-022 19-May-2021 12:00 BH05-1.0 ✓		
EM2109285-023 19-May-2021 12:00 BH05-2.0 ✓		
EM2109285-024 19-May-2021 12:30 BH04-0.1 ✓		
EM2109285-025 19-May-2021 12:30 BH04-0.5 ✓		
EM2109285-026 19-May-2021 12:30 BH04-1.0 ✓		
EM2109285-027 19-May-2021 12:30 BH04-2.0 ✓		
EM2109285-028 19-May-2021 12:50 BH39-0.1		✓
EM2109285-029 19-May-2021 12:50 BH39-0.5		✓
EM2109285-030 19-May-2021 12:50 BH39-1.0		✓
EM2109285-031 19-May-2021 12:50 BH39-2.0		✓
EM2109285-032 19-May-2021 13:10 BH08-0.1 ✓		
EM2109285-033 19-May-2021 13:10 BH08-1.0 ✓		
EM2109285-034 19-May-2021 13:10 BH08-2.0 ✓		
EM2109285-035 19-May-2021 13:50 BH12-0.5 ✔		

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eening Analysis

Issue Date : 20-May-2021

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			(On Hold) SOIL No analysis requested	SOIL - EA037 ASS Field Screening Analysis
EM2109285-036	19-May-2021 13:50	BH12-1.0	✓	
EM2109285-037	19-May-2021 13:50	BH12-2.0	✓	
EM2109285-038	19-May-2021 14:15	BH13-0.1	✓	
EM2109285-039	19-May-2021 14:15	BH13-1.0	✓	
EM2109285-040	19-May-2021 14:15	BH13-2.0	✓	
EM2109285-041	19-May-2021 14:15	BH13-3.0	✓	
EM2109285-042	19-May-2021 14:40	BH18-0.1		✓
EM2109285-043	19-May-2021 14:40	BH18-0.5		✓
EM2109285-044	19-May-2021 14:40	BH18-1.0		✓
EM2109285-045	19-May-2021 14:40	BH18-2.0		✓
EM2109285-046	19-May-2021 14:40	BH18-3.0		✓
EM2109285-047	19-May-2021 00:00	DUP1-210519	✓	
EM2109285-048	19-May-2021 00:00	DUP2-210519	✓	
EM2109285-049	19-May-2021 15:00	BH24-0.1	✓	
EM2109285-050	19-May-2021 15:00	BH24-0.5	✓	
EM2109285-051	19-May-2021 15:00	BH24-1.0	✓	
EM2109285-052	19-May-2021 15:00	BH24-2.0	✓	
EM2109285-053	19-May-2021 15:30	BH29-0.1		✓
EM2109285-054	19-May-2021 15:30	BH29-0.5		✓
EM2109285-055	19-May-2021 15:30	BH29-1.0		✓
EM2109285-056	19-May-2021 15:30	BH29-2.0		✓
EM2109285-057	19-May-2021 15:30	BH29-3.0		✓
EM2109285-058	19-May-2021 15:50	BH23-0.1	✓	
EM2109285-059	19-May-2021 15:50	BH23-0.5	✓	
EM2109285-060	19-May-2021 15:50	BH23-1.0	✓	
EM2109285-061	19-May-2021 15:50	BH23-2.0	1	
EM2109285-062	19-May-2021 16:10	BH25-0.1		✓
EM2109285-063	19-May-2021 16:10	BH25-0.5		✓
EM2109285-064	19-May-2021 16:10	BH25-1.0		✓
EM2109285-065	19-May-2021 16:10	BH25-2.0		✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Issue Date : 20-May-2021

Page

: 4 of 4 : EM2109285 Amendment 0 Work Order Client : WSP Australia Pty Ltd



Requested Deliverables

ALL	INVOICES	
-----	----------	--

- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
EVAN LISHMUND		
 *AU Certificate of Analysis - NATA (COA) 	Email	evan.lishmund@wsp.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	evan.lishmund@wsp.com
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	evan.lishmund@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	evan.lishmund@wsp.com
- Chain of Custody (CoC) (COC)	Email	evan.lishmund@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	evan.lishmund@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	evan.lishmund@wsp.com
SHANE GILIAM		
 *AU Certificate of Analysis - NATA (COA) 	Email	shane.giliam@wsp.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	shane.giliam@wsp.com
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	shane.giliam@wsp.com
 A4 - AU Sample Receipt Notification - Environmental HT (SRN) 	Email	shane.giliam@wsp.com
- Chain of Custody (CoC) (COC)	Email	shane.giliam@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	shane.giliam@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	shane.giliam@wsp.com

DADELAIDE 21 Burma Road Pooraka SA 5095 Ph. 08 8359 0890 E: adelaide@alsglobal.com CHAIN OF CUSTODY

DMACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

DNEWCASTLE 6/685 Maitand Rd Mayfield West NSW 2804 DSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Pht. 02 4014 2500 E: samples sydney@aleglobal com Ph. 02 8/784 8555 E: samples sydney@aleglobal com LINOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

Received: 1915 (T.15 Carrier: COLVI av Work Order Reference ST EM2109285 **Environmental Division** Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. LIWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com OTOWNSVILLE 14-15 Desma Court Boble QLD 4818 Ph: 07 4796 0600 E: townsville environmental@alsglobal.com Additional Information ⁻elephone: + 61-3-8549 9600 RECEIVED BY: °C Seal: Y DATE/TIME: Melbourne 7 Icebrieks ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). Jemp: C/note RELINQUISHED BY: 6 7 Othersonm DATE/TIME: CPERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsgl COC SEQUENCE NUMBER coc 1 2 3 4 (Circle) OF: 1 2 3 4 RECEIVED BY: DATE/TIME: (x0x) Hd Standard TAT may be longer for some tests e.g.. \(\text{\tinntert{\texi\tinte\tancet{\text{\tett{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tin}\tinte\tancet{\text{\text{\text{\text{\text{\text{\text{\texi}\tint{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tin}\tint{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tin}\tint{\text{\text{\text{\texi}\tint{\text{\tin}\tinter{\text{\texit{\text{\ti}\tint{\text{\text{\texit{\texi}\tint{\text{\tet Dilbers on <u>ئ</u> : د ₩ Standard TAT (List due date): ☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mait@alsglobal.com 17 SX 25 RELINQUISHED BY: CONTAINERS 19/3/21 7 DATE/TIME; (refer to TOTAL ALS QUOTE NO. ME-167-16 TURNAROUND REQUIREMENTS: codes below) 255 TYPE & PRESERVATIVE SAMPLER MOBILE: OY 16 871 073 CONTACT PH: 0437 0C7 721 + 747 EDD FORMAT (or default): Email Reports to (will default to PM if no other addresses are listed): Pハ て だない XIATAM ~ 19-5 69:40 108:30 19-5/09:15 19-5 10:40 Email Involce to (will default to PM if no other addresses are listed): accounts DATE / TIME 3+5-COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ALS Laboratory: please tick → PROJECT MANAGER: STANE CILLAN SAMPLER: ENAW LISTIMUSALS PROJECT: OFFICER SOUTH ORDER NUMBER: PS124584 QHOL- 2.5 SAMPLE ID P440 10.1 8740 1 0.5 340L - 1.0 BHOL - 0.5 BHO1 - 2.0 BH01 - 3.0 8441-2.0 BHOL - 6.1 BX41-0.5 BAM - 3.0 8 Hal - 1:0 1.0-19HB 8401 - 0.5 BHH1 - 1.0 1.6-1 Chanamanta COC emailed to ALS? YES 18 HON CLIENT: WSP OFFICE: ₽ P 9 Ø, ٥ Ñ , N 4 00 ガ - 4 S T

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved Plastic; AG = Aminer Drasserved; AP = VOA Vial Sodium Bisuphate Preserved; VS = VOA Vial Sulfuric Preserved; VS = VOA Vial Sulfuric Preserved; VS = VOA Vial Sulfuric Preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldahyde Preserved Positie; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottle; AC = CA Plastic Preserved Bottles; ST = Sterile Bottle; AC = VOA VIAI Preserved Bottles; BT = Sterile Bottles; AC = VOA VIAI Preserved Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; BT = CA Plastic Bag for Acid Sulphate Solis; BT = CA Plastic Bag for Acid Sulphate Solis; BT = CA Plastic Bag for Acid Sulphate Solis; BT = CA Plastic Bag for Acid Sulphate Solis B

CHAIN OF CUSTODY

DGLADSTONE 46 Callemondah Drive Clinton QLD 4680 Phr. 07 7471 5600 E. gladstone@alsglobal.com ALS Laboratory: please tick →

DADELAIDE 2; Burma Road Pooraka SA 5095 DIMOKKY 78 Harbour Road Mackey QL
Ph. 08 8389 0890 E; adelaine@alsgoteat.com
Ph. 07 4844 0177 E; marckay@alsgoteat.com
Ph. 07 8444 0177 E; marckay broad springale vito 3171
Ph. 07 8444 0177 E; marckay broad springale vito 3171
Ph. 07 8444 0177 E; marckay broad springale vito 3171
Ph. 07 8444 0177 E; marckay broad springale vito 3171
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Ph. 08 8444 0177 E; marckay broad springale vito 3171
Ph. 08 8444 0177 E; marckay broad springale v

OMACKAY 78 Harbour Road Mackay OLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

OMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph. 02 6372 6735 E: mudgee.mail@alsglobal.com

A Standard TAT (List due date):

TURNAROUND REQUIREMENTS:

CLIENT: WSP

□NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E. nowra@alsglobal.com

OTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph. 07 4796 0600 E: townsville, envaronmental@alsglobal.com

DNEWCASTLE 5/595 Mailand Rd Mayfield West NSW 2304 DSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph. 02 4014 2500 E. samples, newcastle@alsglobal.com Ph. 02 8784 8556 E. samples, sydney@alsglobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com DPERTH 10 Hod Way Malaga WA 6090 Ph. 08 9209 7655 E: samples.perth@alsglobal.com

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information RECEIVED BY: DATE/TIME: ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). RELINQUISHED BY: e 7 Othercourse DATE/TIME: 6 7 COC SEQUENCE NUMBER 3 4 5 3 4 5 (Circle) RECEIVED BY: coc 1 2 OF: 1 2 DATE/TIME: (xay) Hd Non Standard or urgent TAT (List due date): Emerson Class Olgyerson 35 RELINQUISHED BY: CONTAINERS لہ JATOT DATE/TIME: (refer to (Standard TAT may be longer for some tests e.g... Uttra Trace Organics) codes below) TYPE & PRESERVATIVE SAMPLER MOBILE: OFEE 891 033 35 CONTACT PH: CX34 003 439 ۷ SAR ALS QUOTE NO.: EDD FORMAT (or default): XIATAM 12,50 ah:01 / 5-61 11.33 'n on: (1 + 5 - b) Email Invoice to (will default to PM if no other addresses are listed): accounts DATE / TIME ٢. 15-61 Email Reports to (will default to PM if no other addresses are listed): 19-5 'n COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL = PROJECT MANAGER: SHAME CICLOS PLAN LIFERIO PROJECT: UFFILER SOUTH SAMPLE ID ORDER NUMBER: PS124554 - 2.0 Dr.4 - 1.0 13M43 - 2-0 DM40 - 3.00 Dhos - 0.5 BH05 - 1.0 GHOY - B.1 BHOH . DE 8x40 - 1.0 BH05 - 0.1 CHOK- 2. Pho4 - 20 9M39-2-6 Bn31 - 0.1 8439 - D.S BN31-1.3 COC emailed to ALS? YES PMOS SAMPLER: 9 ħ OFFICE: g 4 8 90 X Ŋ 4 23 35 8 22 6 Š Ñ

Water Container Codes: P = Unpreserved Plastic: N = Nitric Preserved Plastic: ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/CD Preserved; Preserved Plastic: AS = Not Vial Sufficient Preserved Plastic: N = VOA Vial Sufficient Preserved; NS = VOA Vial Sufficient Preserved; NS = VOA Vial Sufficient Preserved Plastic: HS = HCl preserved Plastic: HS = HCl preserved Speciation bottle; SP = Sufficient Preserved Plastic: F = Formaldehyde Preserved Bottles: ST = Sterile Bottles: ASS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bag.

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DADELAIDE 21 Burma Road Pooraka SA 5095 Ph. 08 8359 0890 E: adelaide@alsglobal.com

コBRISEANE 32 Shand Street Stafford QLのMBJ#3CURNE 2-4 Westall Road Springvale VIC 3171 Ph. 07 3243 7222 E. samples binsbane**優番級j0を組むか0600 E**. samples melbourne優alsglobal.com □GLADSTONE 46 Caltemondah Drive Clinton QLD 4680 Ph. 07 7471 5600 E: gladstone@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph; 07 4944 0177 E; mackay@atsglobat.com

ONOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

OTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph. 07 4796 0600 E: townsville-environmental@alsglobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph. 02 4225 3125 E: portkembla@alsglobal.com

ONEWCASTLE 5/566 Manitand Rd Mayfield West NSW 2304 GSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph. 02 4014 2500 E. samples, newcastle@elsgobal.com Ph. 02 8734 8565 E. samples, sydrey@alsgobal.com ⊡PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

RECEIVED BY: RELINQUISHED BY: Random Samples
Other confidence 6 7 6 7 COC SEQUENCE NUMBER 3 4 5 RECEIVED BY: OF: 1 2 coc 1 2 Non Standard or urgent TAT (List due date): Standard TAT (List due date): RELINQUISHED BY: Ŧ TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g... Ultra Trace Organics) 033 SAMPLER MOBILE: O426 84 ALS QUOTE NO. CONTACT PH:

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EDD FORMAT (or default):

Email Invoice to (will default to PM if no other addresses are listed): accounts

Email Reports to (will default to PM if no other addresses are listed):

COC emailed to ALS? YES

PROJECT MANAGER: JEAR CICLAN

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Comments on likely conteminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). PN (Gox) Emerin Gui 35 CONTAINERS 7 JATOT (refer to TYPE & PRESERVATIVE CODES below) 50 يذ 2 XIATAM 5 3:3-13:50 14:15 19:51 13:10 DATE / TIME 19-5 19-5 19-51 COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: - 210519 DUP! - 210519 ; q SAMPLE ID 9 B H13 - 4.0 3418-20 Bx108-2.0 ć BALK - 3.0 BHOK-4.0 8418-0.5 BHIR - 10 BMIL- 1-2 BH12 - 2-0 9月13 1 0.1 8717 - CINS RHIE Shn -BH13 -2000 PB D 九 Ř 84 **6**80 8 36 45 43 **5**7 \$ £ 88 33 3 7

Water Container Codes: P = Unpreserved Plastic; N= Nitric Preserved Plastic; ORC = Nitric Preserved Plastic; ORC = Nitric Preserved Plastic; AS = Sodium Hydroxide Preserved Plastic; AS = Amber Glass: H = HCl preserved Plastic; AS = Amber Glass: H = HCl preserved Plastic; HS = HCl preserved Plastic; Preserved Plastic; F = Formaldehyde Prosen Val Activities of the Activity Preserved Plastic; AS = Plastic Ballinia Preserved Plastic; AS = Plastic Ballinia Plastic; F = Formaldehyde Prosenved Bottle; E = EDTA Preserved Bottle; ASS = Plastic Ballinia Plastic; AS = Plastic Ballinia Plastic;

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DADELAIDE 21 Burma Road Pooraka SA 5095
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Pin 07 4444 0173 E; mackay@jasgibbal com
Part 07 2447 072 E; samples on safurd of catalog analysis of catalog analysis on safurd of catalog analysis of catalog ⊐GLADSTONE 46 Callemondah Drive Clinton CLD 4680 Ph: 07 7471 5600 E: gladskone@alsglobal.com

GMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph; 02 6372 6735 E: mudgee.mail@aisglobal.com

DMACKAY 78 Herbour Road Mackay QLD 4740 Ph: 07 4944 0177 E. mackay@alsglobal.com

⊒NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@aisglobal.com

DTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville, environmental@alsglobal.com

QWOLLONGONG 99 Kerny Street Wollengong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

DNEWCASTLE 5/695 Mailand Rd Mayfield West NSW 2804 DSYDNEY 277-299 Woodpark Road Smithfield NSW 2164 Ph. 02 4014 2500 E. samples newcastle@alsglobal.com Ph. 02 8/794 8655 E. samples sydney@alsglobal.com □PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information RECEIVED BY: DATE/TIME: ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)
Where Metals are required, specify Total (untitlered bottle required) or Dissolved (field filtered bottle required). RELINQUISHED BY: 7 Repromisables DATE/TIME: 3 4 5 6 7 9 COC SEQUENCE NUMBER 3 4 5 (Circle) RECEIVED BY: coc 1 2 OF: 1 2 DATE/TIME: (xay) Hg Non Standard or urgent TAT (List due date): Emerion Cless Oispersion Exchanguable Soliver of Standard TAT (List due date): RELINQUISHED BY: соиталиека Ş JATOT DATE/TIME: (refer to Standard TAT may be longer for some tests e.g.. Jitra Trace Organics) codes below) TURNAROUND REQUIREMENTS: TYPE & PRESERVATIVE P L JAK ALS QUOTE NO.: EDD FORMAT (or default): SAMPLER MOBILE: XIATAM **~** CONTACT PH: 18:30 -5/16:10 19-05 15.2c 15:50 Email Invoice to (will default to PM if no other addresses are listed): accounts DATE / TIME 19.05 Email Reports to (will default to PM if no other addresses are listed): 19.5 COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: 5 BHLJ - 2.0 BH15-0-1 0. BH15-0.5 SAMPLE ID BH24-2.0 8429-30 DAL7 - 0.1 DH13 - 0.5 BH27- 1:0 6. 2 - PIND BA29-0.5 BN29-10 BA24 - 1.0 BA29-0.1 グ・ロ・ナイゼロ J424 - 5.1 BMIE COC emailed to ALS? YES PROJECT MANAGER: ORDER NUMBER: WSP PROJECT: SAMPLER: CLIENT: OFFICE: ZB ⊡ B 43 d 62 83 7 \mathcal{N} \$ 8 \mathcal{J} 3 8 S 9

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Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/GJ Preserved; S = Sodium Hydroxide Preserved; AS = Amber Glass Unpreserved Plastic; AS = VOA Vial Sulfuric Preserved; VS = VOA Vial Sulfuric Preserved; VS = VOA Vial Sulfuric Preserved; VS = VOA Vial Sulfuric Preserved; VS = VOA Vial Sulfuric Preserved Plastic; F = Formaldehyde Preserved Plastic; H = HCI preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: WSP

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ALS Laboratory: please tick → CUSTODY

UBRISBANE 32 Shand Street Stafford QLOMBLEROURNE 2-4 Westall Road Sormgyale VIC 3171 Pr. 07 3243 7222 E: samples brisbane@dh**sgi0baffdfn0**600 E: samples melbourne@alsglooal.com OCLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph; 07 7471 5600 E. gladstone@alsglobal.com CADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 6359 0890 E: adelaide@atsglobal.com

□MUDGEE 27 Sydney Road Mudgee NSW 2950 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

★ Standard TAT (List due date)

TURNAROUND REQUIREMENTS:

DMACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

LINOWRA 4/13 Geary Place North Nowra NSW 2541 Ph. 024423 2063 £: nowra@alsglobal.com

OTOWNSVILLE 14-15 Desma Court Boble QLD 4818 Ph; 07 4796 0600 E. tawnsville, environmental@alsglobal.com

GWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E⁻ portkembla@alsglobal.com

LINEWCASTLE 8/656 Maitend Rd Mayfield West NSW 2204 CBYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph. 02 4014 2500 E. samples, newcastle@alsgjobal com Ph. 02 6784 8555 E. samples sydney@alsgjobal com □PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples perth@alsglobal.com

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information RECEIVED BY: DATE/TIME: ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). 6 7 Random Sample Tel RELINQUISHED BY: DATE/TIME: coc 1 2 3 4 5 6 7 COC SEQUENCE NUMBER 4 (Circle) OF: 1 2 3 RECEIVED BY: DATE/TIME: ☐ Non Standard or urgent TAT (List due date): (xas) Hd CONTANERINE RATION RELINQUISHED BY: TOTAL CONTAINERS DATE/TIME: (refer to (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) codes below) TYPE & PRESERVATIVE 255 سلا 5g0 ALS QUOTE NO.: EDD FORMAT (or default): SAMPLER MOBILE: XIATAM ٤ CONTACT PH: 07.91 / 5-61 Email Invoice to (will default to PM if no other addresses are listed): accounts DATE / TIME Email Reports to (will default to PM if no other addresses are listed): COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: SAMPLE ID Ó ن COC emailed to ALS? YES BHILL PROJECT MANAGER: ORDER NUMBER: PROJECT: SAMPLER: AB ID OFFICE: S

Water Container Codes: P = Unpreserved Plastic: N = Nitric Preserved Plastic: ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/CH Preserved Plastic; AS = Ambor Glass Unpreserved; AP - Airfreight Unpreserved; AP = Mirright Unpreserved; AP = Mirright Unpreserved; AP = Mirright Unpreserved; AP = Mirright Unpreserved AP = Mirright Unpreserved AP = Mirright Unpreserved AP = Mirright Unpreserved AP = Mirright Unpreserved AP = Mirright Unpreserved AP = Mirright Unpreserved Mirright AP = Mirrig

Received: 1915 (T.15 Carrier: Coprier Melbourne
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Work Office Reference Environmental Division Comments on likely contaminant leveis, dilutions, or samples requiring specific QC analysis etc. DWOLLONGONG 99 Kenny Street Wolfongong NSW 2500 Ph: 02 4225 3125 E. portkembla@alsglobal.com Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AS = VOA Vial Solitions Preserved; VS = VOA Vial Solitions Preserved; VS = VOA Vial Solitions Preserved; VS = VOA Vial Solitions Preserved; VS = VOA Vial Solitions Preserved; VS = VOA Vial Solitions Preserved Vial SG = Sulturic Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Bodilies; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bag. DTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph. 07 4796 0800 E. townswile environmental@alsglobat.com Additional Information DNEWOASTLE 61986 Maitland Rd Mayfield West NSW 2304 _DSYDNEY 2777.289 Woodperk Road Smithfield NSW 2164 Ph. 02 4014 2500 E; samples newzastle@alsglobal com Ph. 02 8784 8556 E, samples sydney@asglobal.com Telephone : + 61-3-8549 9600 RECEIVED BY: DATE/TIME: °C Seal: Y Teebricks | ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered bothe required) or Dissolved (field filtered botte required). Lombic & C/note; RELINQUISHED BY: 1 6 7 Other contrains "INOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E. nowra@alsglobal.com OPERTH 10 Hod Way Malaga WA 8090 Ph. 08 9209 7655 E: samples.perth@alsglobal.com DATE/TIME: 2 9 COC SEQUENCE NUMBER 3 4 5 OF: 1 2 3 4 RECEIVED BY: coc 1 2 DATE/TIME: (xox) Hd (Standard TAT may be longer for some tests e.g. \tag \text{Non Standard or urgent TAT (List due date):} Diller **ائر بر** ¥ Standard TAT (List due date): □MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com DMACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com RELINQUISHED BY: 17 SZ TOTAL CONTAINERS 19/1/26 OBRISBANE 32 Shand Street Stafford OLBANBARDURNE 2-4 Westall Road Springvale VIC 3171 Ph: 07 3243 7222 E: semples brisbane@ahapba83skeho600 E: samples moltourne@alsglobel.com DATE/TIME (refer to ALS QUOTE NO .: ME-167-21 TURNAROUND REQUIREMENTS: codes below) 735 TYPE & PRESERVATIVE GCLADSTONE 46 Callemondan Drive Clinton QLD 4680 Ph. 07 7471 5600 E: gladstone@alsglobal.com SAMPLER MOBILE: O416 891 073 CONTACT PH: 04(37 007 271 CIADELAIDE 21 Burma Road Pooraka SA 5095 Ph. 08 9359 0890 E: adelaide@alsglobal.com 440 EDD FORMAT (or default): Email Reports to (will default to PM if no other addresses are listed): PM + CVan XIATAM 1 1948 108:30 19-5 6 69:40 Email Invoice to (will default to PM if no other addresses are listed); accounts 51:10 19-5 (10:40 DATE / TIME 15-61 COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CHAIN OF CUSTODY ALS Laboratory: please tick → PROJECT MANAGER: SHANE CILLIDIN EVAN LISHMUND PROJECT: OFFICER SOUTH ORDER NUMBER: PS124584 SAMPLE ID BHOL- 2.3 B440 -0.1 8440 1 6.5 BHOL - 1. 5 1 3.0 BHOT - 0.5 BH01 - 2.0 BH41-2.0 8 Hal - 1.5 BH41-0.5 Brith - 3.0 BHO2 -0.1 BH01 - 0.5 BM41-0-1 BAH1 - 1:0 Enumonary 1.6- 10HB COC emailed to ALS? YES BHOI CLIENT: WSP SAMPLER: OFFICE: <u>₽</u> 9 <u>0</u> 4 8 $\tilde{\omega}$ <u></u> 0 Š S <u>_</u> σ

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ALS Laboratory: please tick → CHAIN OF CUSTODY

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OFFICE:

OADELAIDE 21 Burma Road Pooraka SA 5095 Pr; 08 8359 0890 E: adelaide@alsglobal.com

GBRISBANE 32 Shand Street Stafford Od**DARGEROURNE** 2-4 Westall Road Springvale VIC 3171 Ph. 07 3243 7222 E: samples brisband@AbgNBd.sban0600 E: samples molbourne@alsglobal.com DSLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E. gladstone@alsglobal.com

OMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph. 02 6372 6735 E: mudgee.mail@alsglobal.com

□MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

DNEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com DNOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal com

DTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph. 07 4796 0600 E: townsville environmental@alsglobal.com DSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph; 02 8784 8555 E. samples, sydney@aisglobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph. 02 4225 3125 E. portkembla@alsglobal.com

OPERTH 10 Hod Way Malaga WA 6090 Ph. 08 9209 7655 E: samples.perth@alsglobal.com

RECEIVED BY: DATE/TIME: RELINQUISHED BY: DATE/TIME: 3 4 5 6 7 2 9 COC SEQUENCE NUMBER 40 (Circle) RECEIVED BY: coc 1 2 0F: 1 2 DATE/TIME: Non Standard or urgent TAT (List due date): 쟨 Standard TAT (List due date) RELINGUISHED BY: DATE/TIME: (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) TURNAROUND REQUIREMENTS: SAMPLER MOBILE: OYEL BY1 033 CONTACT PH: 0434 003 739 ALS QUOTE NO.: EDD FORMAT (or default):

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite

Email Invoice to (will default to PM if no other addresses are listed): accounts

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Email Reports to (will default to PM if no other addresses are listed):

COC emailed to ALS? YES

PROJECT MANAGER: SHANG CICIPIN

PROJECT: OFFICER SOUTH

ORDER NUMBER: PS,124554

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Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field (x oy) Hd class Emerso-ر م CONTAINERS لے (refer to codes below) TYPE & PRESERVATIVE E ۷ SAR XIATAM Ś 12:50 12.30 .C. 21 ah; 01 | 5-61 on: (1) 5- b) DATE / TIME 19-5 7 % 19-5 SAMPLE ID 2.0 DHOH - 1.0 12m40 - 2-0 DH05 - 0.5 BH05 - 1.0 8404 - B.1 BM40 - 3.00 BHOH - DE BA40 - 10 DHOH - 20 BH05 - 0.1 BN31 - 0.1 Bu39 - 0.5 9M39-2-0 BHO8- 5.1 BN29-1.3 GMOS K 8 AB ID 8 3 X 4 8 32 J 90 53 22 6 Ñ 3

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved DRC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfielght Unpreserved; AV = Airfielght Unpreserved Vial Sulfuric Preserved Vial

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CLIENT:

ALS Laboratory: please tick →

DBRIBBANE 32 Shand Street Stafford Olds/NEDBOURNE 2.4 Wostall Road Springwate VIG 3171
Pht 0732437222 E: samples Insteame@abspl68dswef000 E: samples melosume@abspl6adsmcom
DGLADSTONE 44 Callemonther Drive Cinton QLD 4680
DGLADSTONE 44 Callemonther Drive Cinton QLD 4680
PGLADSTONE 52 System Front Manager and Manager a CIADELAIDE 21 Burma Road Pooraka SA 5095 Ph. 08 8359 0890 E. adelaide@alsgebal.com

TURNAROUND REQUIREMENTS:

CIMACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

OMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph; 02 6372 6735 E: mudgee.mail@alsglobal.com

QWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E. portkembla@alsglobal.com DTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph. 07 4796 0600 E: townsvile, environmental@alsglobal.com

DNEWCASTLE £/685 Natitand Rd Mayfield West NSW 2304 DSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph; 02 4014 2500 E: samples newcastle@alsglobal.com Ph; 02 8784 8556 E: samples sydney@alsglobal.com CINOWRA 4/13 Geary Place North Nowra NSW 2541 Ph; 024423 2063 E: nowa@alsglobal.com □PERTH 10 Hod Way Malaga WA 6090 Ph; 08 9209 7655 E·samples.perth@alsglobal.com Standard TAT (List due date):

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information RECEIVED BY: DATE/TIME: ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field RELINQUISHED BY: DATE/TIME: 3 4 5 6 7 9 filtered bottle required). COC SEQUENCE NUMBER s (Circle) OF: 1 2 3 4 RECEIVED BY: DATE/TIME: coc 1 2 (xon) Ng Non Standard or urgent TAT (List due date): Sychange organico. RELINQUISHED BY: 32 CONTAINERS 7 JATOT ANERINEGRMATION DATE/TIME: (refer to (Standard TAT may be longer for some tests e.g... Ultra Trace Organics) codes below) 750 TYPE & PRESERVATIVE 033 يد SAMPLER MOBILE: 0426 84 2 ALS QUOTE NO.: EDD FORMAT (or default): XINTAM 5 CONTACT PH: 3:3 14:15 19-5 13:50 21:21 | 13:10 Email Invoice to (will default to PM if no other addresses are listed): accounts DATE / TIME 19-5 19-5 Email Reports to (will default to PM if no other addresses are listed): COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: PROJECT MANAGER: JYANE GILLAM CLAR CIRRADO DUCE - 21 05 19 OFFICER SOUTH DUP! - 210519 SAMPLE ID 4:0 8 HIJ - 4.0 ORDER NUMBER: PSILY 554 BH08-2.0 رب د 8418 b. BHIX - 7.0 BALK - 3.0 BH08-4.0 8-12- C.S BHIR - 10 BHIL - 200 3月13 10.1 BRIL - PS BAIL- 1-3 BH13 -3 HI3 -COC emalled to ALS? YES PROJECT: SAMPLER: 力 LAB ID 480 OFFICE: 8 3 34 \$ 47 43 44 Z Ł 89 89 Ŧ

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; N = Nitric Preserved Plastic; N = Nitric Preserved Plastic; N = Not Vial Sodium Bisuphate Preserved Plastic; N = WOA Vial Sodium Bisuphate Preserved Vial Sodium Bisuphate Preserved Vial Sodium Bisuphate Preserved Vial Sodium Bisuphate Preserved Vial Sodium Bisuphate Preserved Vial Sodium Bisuphate Preserved Plastic; H = HCI preserved Plastic; HS = HCI preserved Plastic; F = Suffuric Preserved Plastic; F = Formaldehyde Preserved Big.

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口BRISBANE 22 Shand Stree: Stafford Ol**3AがBXBO**URNE 2-4 Wessall Road Springvale VIC 3171 Ph: 07 3243 7222 E: samples, brisbane@**4Bgj6bafbWn**9800 E. samples,melbourne@alaglobal.com □ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal com

DSLADSTONE 46 Callemondah Drive Cilinon QLD 4680 DMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph. 07 7471 5600 E. gladstone@alsglobal.com Ph. 02 6372 6735 E. mudgee mail@alsglobal.com

DMACKAY 78 Harbour Road Mackay OLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

★ Standard TAT (List due date):

TURNAROUND REQUIREMENTS:

CLIENT: WSP

DNEWCASTLE 5588 Maitand Rd Mayfield West NSW 2394 DSYDNEY 277-299 Woodpark Road Smithfield NSW 2164 Ph. 02 4014 2500 E. samples, newcastle@alsglobal.com Ph. 02 8784 8558 E. samples sydney@alsglobal.com DNOWRA 4/13 Geary Place North Nowra NSV/ 2541 Ph: 024423 2063 E. nowra@alsglobal.com

GTOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph; 07 4796 0600 E: townswile environmental@alsglobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph; 02 4225 3125 E portkembla@alsglabal.com

ร์อลไม่รับอาณาจกิดเมระโดงแก่ (ตามกา DPERTH 10 Hod Way Malaga WA 6090 Ph; 08 9209 7655 E: samples,perth@alsglobal.com

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PROJECT	PROJECT MANAGER:	CONTACT PH:	ij	-				<u>#</u>	2 3 4 5 6	7	Other comment Feet 11 Feet 1		
SAMPLER:	Ä.	SAMPLER MOBILE:	10BILE:		RELINQUISHED BY:	D BY:		RECEIVED BY:	ED BY:	RELINQUI	RELINQUISHED BY:	RECEIVED BY:	
COC ema	COC emailed to ALS? YES	EDD FORMAT (or default):	₹T (or def.	ault):	1								
Email Rep	Email Reports to (will default to PM if no other addresses are listed):	sses are listed):			DATE/TIME:			DATE/TIME:	ME:	DATE/TIME:		DATE/TIME:	
Email Inv	Email Invoice to (will default to PM if no other addresses are listed): accounts	ses are listed): accounts							:				
COMMEN	COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:	IISPOSAL:											
	OLEU CAMANA OLEU CAMANA	ENALISM NVATERIWN		CONTAINED INFORM	RMATION	w w	ALYSIS REQU There Metals at	JIRED inclu re required,	iding SUITES (NB. Supplies) specify Total (untilter	uite Codes mus ed bottle requir	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field	Additional Information	
							7		filtered bottle requ	lired).	-		
	SAMPLEID	DATE / TIME	ХІЯТАМ	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL CONTAINERS	Enerton New Chargito Sectonopubbi Cacibol (an) Hg	-Privibal (xay) Ha	(·		Comments on likely contaminant levels, dilutions, or samples requiring specific OC analysis etc.	. Q
64)	DH24 - 5.1	19-05/15.20	~	JAK - ASS		2							
B	DAL4-0.5												
Ñ	BA24 - 1.0	>	>	\		ر.	-						
8	BH24-2.0												
\$3	BH29-0.1	19-05 15:30						^					
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th	BH29-7.2							\					
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$ \mathscr{F} $	BH27 1.0				·								
ē	BHLJ - 2,0												
62	BH15-0.1	01:91 3-61										1.00	
G	PH15-0.5							\					
£	0.1 - 21NB							\					
					TOTAL	75							
Water Cont	Water Containar Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxida/Cd Preserved; S = Sodium Hydroxida Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfieight Unpreserved Plastic	ic Preserved Plastic; ORC = Nitr	ic Preserve	od ORC; SH = Sodium Hydroxide/Cd F	reserved; S = Sodio	um Hydroxide	Preserved Plas	tic; AG = A	mber Glass Unpresen	ed; AP - Airfre	ght Unpreserved Plastic		Τ

OADELAIDE 21 Burms Road Pooraka SA 5096 Ph: 08 8359 0890 E: adelaide@alsglobal.com CHAIN OF CUSTODY ALS Laboratory: please tick →

CLIENT: WSP

OFFICE:

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph. 02 4225 3125 E. portkempla@alsqlobal.com DTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph; 07 4786 0600 E; townsville environmental@alsglobal.com ONEWCASTLE 5585 Maitland Ra Mayfield West NSW 2304 OSYDNEY 277,289 Woodpan Road Smithfield NSW 2164 Ph. 02 4014 2500 E. samples newcasile@alapfobal.com Ph. 02 8734 8555 E. samples sydney@alapfobal.com ⊡NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com CPERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples perth@atglobal. Standard TAT (List due date): DMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph; 02 6372 6735 E: mudgee.mail@alsglobal.com DMACKAY 78 Harbour Road Mackay QLD 4740 Pn: 07 4944 0177 E: mackay@alsglobal.com UBRISBANE 22 Shand Street Station Old NUBBOURNE 2-4 Weshalf Road Springwale VIG 3171
DILV 07 2012 Establish Stratement Shang Station Station Composition Station RNAROUND REQUIREMENTS:

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Water Container Codes: P = Utpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved RP - Affreight Unpreserved Plastic; AC = VOA Vial Sulfuric Preserved Anna RP - Affreight Unpreserved Plastic; AC = VOA Vial Sulfuric Preserved Plastic; H = HCI preserved Plastic; HS = HCI preserved Bodies; T = Storile Bottle; E = EDTA Preserved Bodies; ST = Storile Bottle; ASS = Plastic Bod for Acid Sulphate Solis; B = Unpreserved Bag. Additional Information RECEIVED BY: DATE/TIME: ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field RELINQUISHED BY: OF: 1 2 3 4 5 6 7 Other com DATE/TIME: COC 1 2 3 4 5 6 7 filtered bottle required). COC SEQUENCE NUMBER RECEIVED BY: DATE/TIME: (xay) Ha RELINQUISHED BY: CONTAINERS JATOT DATE/TIME: (refer to TYPE & PRESERVATIVE COdes below) 3 سلا ALS QUOTE NO.: 2 80 EDD FORMAT (or default): SAMPLER MOBILE: XIRTAM ب CONTACT PH: Email Invoice to (will defauit to PM if no other addresses are listed); accounts 07:91 / 5-61 DATE / TIME Email Reports to (will default to PM if no other addresses are listed): COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: BH28-20 SAMPLE ID COC emailed to ALS? YES PROJECT MANAGER: ORDER NUMBER: PROJECT: SAMPLER: 8 LABID



CERTIFICATE OF ANALYSIS

Work Order : EM2109285

: WSP Australia Pty Ltd

Contact : MR SHANE GILIAM

Address : Level 15, 28 Freshwater Place

SOUTHBANK VIC. AUSTRALIA 3006

Telephone : +61 03 9861 1111

: PS124554 **Project**

Order number

Client

C-O-C number

Sampler : EVAN LISHMUND

Site

Quote number : ME/167/21

No. of samples received : 65 No. of samples analysed : 33 Page : 1 of 9

> Laboratory : Environmental Division Melbourne

Contact : Graeme Jablonskas

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +6138549 9609

: 19-May-2021 17:15 **Date Analysis Commenced** : 24-May-2021

Date Samples Received

Issue Date : 25-May-2021 15:31

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

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

Nikki Stepniewski Senior Inorganic Instrument Chemist Melbourne Inorganics, Springvale, VIC Page : 2 of 9

Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554

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

~ = Indicates an estimated value.

• ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme

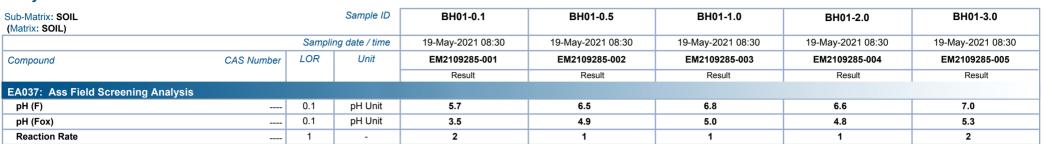
EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.



Page : 3 of 9
Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554

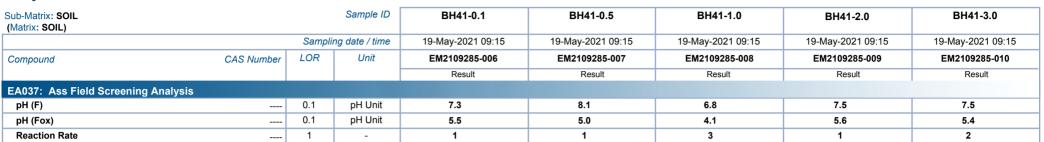




Page : 4 of 9
Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554

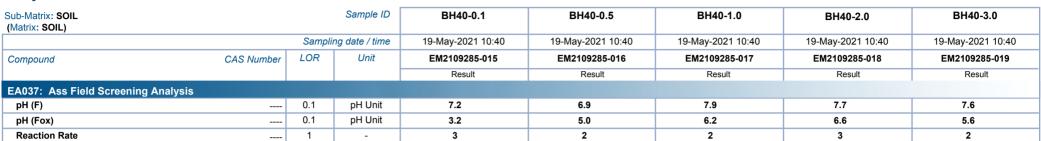




Page : 5 of 9
Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554

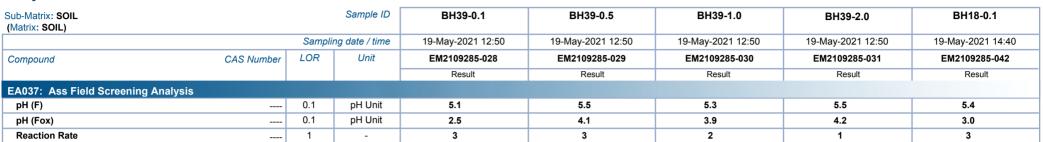




Page : 6 of 9
Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554

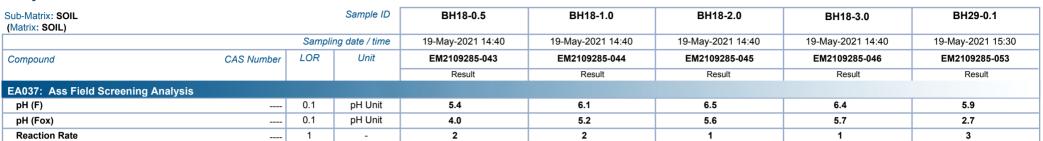




Page : 7 of 9
Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554

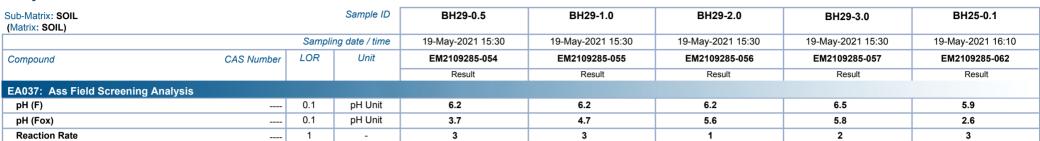




Page : 8 of 9
Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554

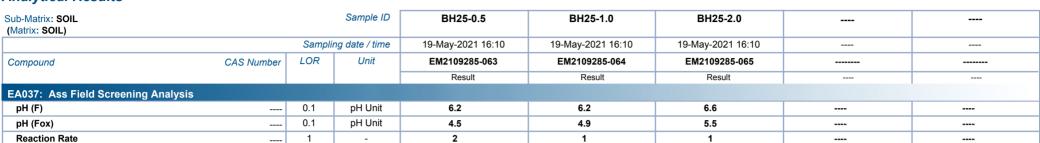




Page : 9 of 9 Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554







QUALITY CONTROL REPORT

Work Order : **EM2109285**

: WSP Australia Pty Ltd

Contact : MR SHANE GILIAM

Address : Level 15, 28 Freshwater Place

SOUTHBANK VIC, AUSTRALIA 3006

Telephone : +61 03 9861 1111

Project : PS124554

Order number : ----

C-O-C number : ----

Sampler : EVAN LISHMUND

Site · ____

Quote number : ME/167/21

No. of samples received : 65
No. of samples analysed : 33

Page : 1 of 3

Laboratory : Environmental Division Melbourne

Contact : Graeme Jablonskas

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +6138549 9609
Date Samples Received : 19-May-2021
Date Analysis Commenced : 24-May-2021
Issue Date : 25-May-2021

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

Client

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

Nikki Stepniewski Senior Inorganic Instrument Chemist Melbourne Inorganics, Springvale, VIC

Page : 2 of 3 Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554



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

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 L	Duplicate (DUP) Report		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA037: Ass Field S	creening Analysis (C	C Lot: 3693235)							
EM2109285-001	BH01-0.1	EA037: Reaction Rate		1	-	2	2	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	5.7	5.8	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	3.5	3.5	0.0	0% - 20%
EM2109285-010	BH41-3.0	EA037: Reaction Rate		1	-	2	2	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	7.5	7.5	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	5.4	5.4	0.0	0% - 20%
EA037: Ass Field S	creening Analysis (C	C Lot: 3693236)							
EM2109285-043	BH18-0.5	EA037: Reaction Rate		1	-	2	2	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	5.4	5.4	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	4.0	4.1	0.0	0% - 20%
EM2109285-062	BH25-0.1	EA037: Reaction Rate		1	-	3	3	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	5.9	5.9	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	2.6	2.7	0.0	0% - 20%

Page : 3 of 3

EM2109285 Work Order

Project PS124554

Client · WSP Australia Pty Ltd



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.

• No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.

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.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EM2109285** Page : 1 of 4

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

 Contact
 : MR SHANE GILIAM
 Telephone
 : +6138549 9609

 Project
 : PS124554
 Date Samples Received
 : 19-May-2021

 Site
 : --- Issue Date
 : 25-May-2021

Sampler : EVAN LISHMUND No. of samples received : 65
Order number :---- No. of samples analysed : 33

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.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers: Analysis Holding Time Compliance

NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

• NO Quality Control Sample Frequency Outliers exist.

Page : 2 of 4
Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554



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 <u>VOC in soils</u> 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: **x** = Holding time breach ; ✓ = Within holding time

Matrix: SOIL					Evaluation	: × = Holding time	breach ; ✓ = Withi	n holding tim
Method		Sample Date	E	xtraction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis								
Snap Lock Bag - frozen (EA037)								
BH01-0.1,	BH01-0.5,	19-May-2021	24-May-2021	15-Nov-2021	✓	25-May-2021	15-Nov-2021	✓
BH01-1.0,	BH01-2.0,							
BH01-3.0,	BH41-0.1,							
BH41-0.5,	BH41-1.0,							
BH41-2.0,	BH41-3.0,							
BH40-0.1,	BH40-0.5,							
BH40-1.0,	BH40-2.0,							
BH40-3.0,	BH39-0.1,							
BH39-0.5,	BH39-1.0,							
BH39-2.0,	BH18-0.1,							
BH18-0.5,	BH18-1.0,							
BH18-2.0,	BH18-3.0,							
BH29-0.1,	BH29-0.5,							
BH29-1.0,	BH29-2.0,							
BH29-3.0,	BH25-0.1,							
BH25-0.5,	BH25-1.0,							
BH25-2.0								

Page : 3 of 4
Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554



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.

Wattist COIL				Lvaldatio	ii. Quality Oc	ontrol frequency fr	duality Control in equality within opcomoducin.
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	OC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	4	33	12.12	10.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 4 of 4 Work Order : EM2109285

Client : WSP Australia Pty Ltd

Project : PS124554



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
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Preparation Methods	Method	Matrix	Method Descriptions
Drying only	* EN020D	SOIL	In house



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2109392

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact : MR SHANE GILIAM Contact : Graeme Jablonskas

Address : Level 15, 28 Freshwater Place Address : 4 Westall Rd Springvale VIC Australia

3171

 Telephone
 : +61 03 9861 1111
 Telephone
 : +6138549 9609

 Facsimile
 : +61 03 9861 1144
 Facsimile
 : +61-3-8549 9626

Project : PS124554 Page : 1 of 3

SOUTHBANK VIC, AUSTRALIA 3006

 Order number
 : PS124554
 Quote number
 : EM2021PARBRIVIC0004 (ME/167/21)

 C-O-C number
 : --- QC Level
 : NEPM 2013 B3 & ALS QC Standard

Site : Officer South

Sampler : EL

Dates

Date

Delivery Details

 Mode of Delivery
 : Client Drop Off
 Security Seal
 : Not Available

 No. of coolers/boxes
 : 3
 Temperature
 : 5.0°C - Ice present

Receipt Detail : No. of samples received / analysed : 45 / 21

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 direct any queries related to sample condition / numbering / breakages to Client Services.
- Sample Disposal Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Analytical work for this work order will be conducted at ALS Springvale.
- 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 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.

Issue Date : 21-May-2021

Page

: 2 of 3 : EM2109392 Amendment 0 Work Order Client : WSP Australia Pty Ltd



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) SOIL sis req	A037 d Scre
Laboratory sample	Sampling date /	Sample ID	On Hold) SOII Vo analysis red	SOIL - EA037 ASS Field Scre
EM2109392-001	20-May-2021 00:00	BH30-0.1	<u> </u>	1
EM2109392-002	20-May-2021 00:00	BH30-0.5		1
EM2109392-003	20-May-2021 00:00	BH30-1.0		1
EM2109392-004	20-May-2021 00:00	BH30-2.0		1
EM2109392-005	20-May-2021 00:00	BH30-3.0		✓
EM2109392-006	20-May-2021 00:00	BH20-0.1	✓	
EM2109392-007	20-May-2021 00:00	BH20-0.5	✓	
EM2109392-008	20-May-2021 00:00	BH20-1.0	✓	
EM2109392-009	20-May-2021 00:00	BH20-2.0	✓	
EM2109392-010	20-May-2021 00:00	BH20-3.0	✓	
EM2109392-011	20-May-2021 00:00	DUP03-210520	✓	
EM2109392-013	20-May-2021 00:00	BH26-0.1	✓	
EM2109392-014	20-May-2021 00:00	BH26-0.5	✓	
EM2109392-015	20-May-2021 00:00	BH26-1.0	✓	
EM2109392-016	20-May-2021 00:00	BH26-2.0	✓	
EM2109392-017	20-May-2021 00:00	BH27-0.1	✓	
EM2109392-018	20-May-2021 00:00	BH27-0.5	✓	
EM2109392-019	20-May-2021 00:00	BH27-1.0	✓	
EM2109392-020	20-May-2021 00:00	BH27-2.0	✓	
EM2109392-021	20-May-2021 00:00	BH32-0.1		✓
EM2109392-022	20-May-2021 00:00	BH32-0.5		✓
EM2109392-023	20-May-2021 00:00	BH32-1.0		✓
EM2109392-024	20-May-2021 00:00	BH32-2.0		✓
EM2109392-025	20-May-2021 00:00	BH32-3.0		✓
EM2109392-026	20-May-2021 00:00	BH33-0.1		✓
EM2109392-027	20-May-2021 00:00	BH33-0.5		✓
EM2109392-028	20-May-2021 00:00	BH33-1.0		✓
EM2109392-029	20-May-2021 00:00	BH33-2.0		✓
EM2109392-030	20-May-2021 00:00	BH33-3.0		✓
EM2109392-031	20-May-2021 00:00	BH19-0.1		✓
EM2109392-032	20-May-2021 00:00	BH19-0.5		✓
EM2109392-033	20-May-2021 00:00	BH19-1.0		✓
EM2109392-034	20-May-2021 00:00	BH19-2.0		✓
EM2109392-035	20-May-2021 00:00	BH19-3.0		✓
EM2109392-036	20-May-2021 00:00	BH16-0.1	✓	

analysis requested	L - EA037	Field Screening Analysis

Issue Date : 21-May-2021

Page

3 of 3 EM2109392 Amendment 0 Work Order Client : WSP Australia Pty Ltd



			(On Hold) SOIL No analysis requested	SOIL - EA037 ASS Field Screening Analysis
EM2109392-037	20-May-2021 00:00	BH16-0.5	✓	
EM2109392-038	20-May-2021 00:00	BH16-1.0	✓	
EM2109392-039	20-May-2021 00:00	BH16-2.0	✓	
EM2109392-040	20-May-2021 00:00	BH16-3.0	✓	
EM2109392-041	20-May-2021 00:00	DUP05-210520		✓
EM2109392-043	20-May-2021 00:00	BH21-0.1	✓	
EM2109392-044	20-May-2021 00:00	BH21-0.5	✓	
EM2109392-045	20-May-2021 00:00	BH21-1.0	✓	
EM2109392-046	20-May-2021 00:00	BH21-2.0	✓	
EM2109392-047	20-May-2021 00:00	BH21-3.0	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts PayableAU		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
EVAN LISHMUND		
 *AU Certificate of Analysis - NATA (COA) 	Email	evan.lishmund@wsp.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	evan.lishmund@wsp.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	evan.lishmund@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	evan.lishmund@wsp.com
- Chain of Custody (CoC) (COC)	Email	evan.lishmund@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	evan.lishmund@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	evan.lishmund@wsp.com
SHANE GILIAM		
 *AU Certificate of Analysis - NATA (COA) 	Email	shane.giliam@wsp.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	shane.giliam@wsp.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	shane.giliam@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	shane.giliam@wsp.com
- Chain of Custody (CoC) (COC)	Email	shane.giliam@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	shane.giliam@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	shane.giliam@wsp.com



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Ph: 07 3243 7222 E: samples.brissone@#bgib8afbbbre600 E: samples melbourne@alsglobal.com

OMUDGEE 27 Sydney Road Mudgee NSW 2850

Ph: 02 4014 2500 E; samples newcastle@alsglobal.com

□NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2083 E: nowra@alsglobal.com

□PERTH 10 Hod Way Malaga WA 6090

Ph: 02 8784 6555 E: samples.sydney@alsglobal.com

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UWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 F: portkembla@alsolobal.com

	rorimenta: A	LS Laboratory: ☐GLADSTON Ph: 07 7471 5	IE 46 Callen i600 E. glads	nondah Drive Clinton QLD 4680 GMUD stone@alsglobal.com Ph: 02	GEE 27 Sydney Ro 6372 6735 E: mudg	ad Mudgee NSV ee.mail@alsglob	V 2850 bal com	OPERTH 10 Ph: 08 9209 7	Hod Way Malaga W 7655 E: samples pert	h@alsglobal.com	Ph: 02 4225 3	ONG 99 Kenny Street Wollongong NSW 2500 1125 E: portkembla@alsglobal.com
LIENT:	WSP			AROUND REQUIREMENTS :		d TAT (List o	due date):			FOR LABORATO		
FFICE:			Ultra Tra	rd TAT may be longer for some tests e.c.	LI NOIT 312	andard or urg	ent TAT (List du	e date):	UENCE NUMBER	Custody Seal intendic Free lost Intizen icel	ricke presenji	porter in
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	JMBER: 18124554							OF: 1 2				
	MANAGER: SHANE L			137 003 771 0426 841 973	RELINQUIS	HED BY			BY: O	RELINQUISHED BY:	a. Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa Santa	RECEIVED BY:
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	led to AL\$? YES	EDD FORM			DATE/TIME					DATE/TIME:		DATE/TIME:
		ther addresses are listed): 5\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<u> </u>	<u> </u>	20-0		17:30	DATE/TIME:	30			
	rs/special Handling/Stor				1, 2		·					
		A CONTRACTOR OF THE PARTY OF TH	9K 3.42						price)	uite Codes must be listed to		Additional Information
AUS USE	MATRIX	AMRIE DETALS	•	CONTAINER INF	ORMATION.		Where Metals	are required, spe	cify T otal (unfilter filtered bottle requ	ed bottle required) or Disso iired).	lved (field	Additional information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL	(20x) Hq					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH30 - 0.1	20-5 08:30	S	JAR + ASS		2	1					onmental Division ourne
2	BH30 - 0.5						/				181	wy Order Reference
			-				/		-		E	M2109392 -
2	BH30 - 1.0		_				ļ ,			 		_
4	BN30 - 20						/					
5	BN30 - 3.0						/					
6	Br120 - 31	20-5/09:20										
7	BH20 - 0.5										Toloph	none: +61-3-8549 9600
8	BH20 - 1.0										, erebi	,
9	BH20 - 2.0										-	
(0	Bn10 - 7.0											
11	D1603 - 5102.	ζ 5										
12	DJ804 - 2105	70										Front to Eurofful
13	BH16 - 0.1	20-5 09:50					Reco	eived:[]	1511:3	OCarrier: (17	unt_	
14	BH26 - 0.5		-				C/nc Tem	ote:	C Seal:	10 1		
15	BH16 - 1.0						(1)	O. Z iq / Icobrick	s / NA		<u> </u>	
16	BH26 - 2-0				· · · · · · · · · · · · · · · · · · ·				<u></u>	ALS		
					TOTAL	32						



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Ph. 07 3243 7222 E. samples brisbane@alsgiobal.com

⊔MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph; 02 6372 6735 E: mudgee.mail@alsglobal.com □GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 F: diadstone@alsolobal.com

DNEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 | DSYDNEY 277-288 Woodpark Road Smithfield NSW 2164 | Ph 102 4014 2500 E. samples newcastle@alsglobal.com | Ph 102 8784 8555 E. samples aydney@alsglobal.com | Ph 102 8784 8555 E. samples aydney@alsglobal.com □NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com DPERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7656 E: samples.perth@alsglobal.com

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□WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

please tick →				Local and a construction of the particular state of the s	
CLIENT: WSP	TURNAROUND REQUIREMENTS:	★ Standard TAT (List due date):		FOR CABORATORY USE ONLY.	(Circle)
OFFICE:	(Standard TAT may be longer for some tests e.g Ultra Trace Organics)	g Non Standard or urgent TAT (Lis		Custody/Seal intect/4 in the custody Seal intect/4 in the custody Seal interest (1) in the custody	Yes No E NA
PROJECT: OFFICER SOUTH	ALS QUOTE NO.:		COC SEQUENCE NUMBE (Circle)	receipt()	
ORDER NUMBER: PSIZ4554			COC 1 2 3 4 5 6	7 Random Sample Temperature on Rece	or by Charles
PROJECT MANAGER:	CONTACT PH:		OF: 1 2 3 4 5 6	7 Other comment :	
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default):				
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME:
Email Invoice to (will default to PM if no other addresses a	re listed): accounts				
	2041				

ALS USE	SAMPLE DET	AILS (W)			CONTAINER INFORMATION			specify Tot	price)	bottle requi	st be listed to attract suite	Additional Information
LAB ID	SAMPLE ID	DATE	/TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	pH (Fox)					Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
17	B427-0.1	20-5	10:15	S	JAR + ASS	2_						
8	BM27-0.5											
9	BH22-1.3											
LC	BH27-2.0											
ار	BH32 - 0.1	20-5	10:50				1					
17	BN32 - 0.5						/					
13	17432 -1.0							 				
4	BN92 - 2.0											
1	BU32 -3,0						<i>'</i>					
15	BH37 - 6.1	20-5	11:20									
17 18 19	BN33 - 0.5									,		
18	BN37 - 1.0						/				_	
19	BH33 - 2.0						/					
50	BH33 - 3.0						/					
51	BH19 - D. 1	20-5	1 12:40				1					
57	BN19-0.5	20-6	12:40				/					
					TOTAL	72						

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved Plastic; F = Formaldehyde Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Plastic; HS = HCl preserved Plastic; H



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JGLADSTONE 46 Callemondab Drive Clinton OLD 4680 ☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com Ph; 07 7471 5600 E; gladstone@alsglobal.com

Ph: 02 4014 2500 E: samples newcastie@alsolobal.com CINOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

□PERTH 10 Hod Way Malaga, WA 6090 Ph: 08 9209 7655 F: samples perth@alagipbal.com

DINEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 DSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E; samples.sydney@alsglobal.com LITOWNSVILLE 14-15 Desma Court Boble QLD 4818 Ph: 07 4798 0600 E: townsville.environmental@alsglobal.com

TWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

	please tick -3									The state of the s	
CLIENT:	WSP			AROUND REQUIREMENTS:		d TAT (List o	-			FOR LABORATORY USED Custody Sealing 7 Energies/(myza, ice brides present a company) 7 Random Sagpie Temperature of	NLY (Gircle)
OFFICE:	As every part to the transport		Ultra Tra	d TAT may be.longer for some tests e.g. <u>ce Organics)</u>	□ Non St	andard or urg	ent TAT (List d	ue date):	QUENCE NUMBE	Custody/Sealinted/2	region and the second s
	officer south		ALS Q	UOTE NO.:					(Circle)	receipt?	To shring the state of the stat
	IMBER: PS124554	CONTACT P	1.					OF: 1 2	3 4 5 6	7 Rencompagnation of the comments of the comme	
SAMPLER:	MANAGER:	SAMPLER M			RELINQUISHED BY:		RECEIVED		RELINQUISHED BY:	RECEIVED BY:	
	ed to ALS? YES	EDD FORMA		fault):							
	orts to (will default to PM if no other address				DATE/TIME	:		DATE/TIME	:	DATE/TIME:	DATE/TIME:
Email Invo	ice to (will default to PM if no other addresse	es are listed): accounts									
COMMENT	S/SPECIAL HANDLING/STORAGE OR DIS	SPOSAL:									
ALS) USE	SAMPLE DE MATRIX SOLID(S)	TAILS *** WATER (W)		CONTÂNERINFO	RMATION				price)	uite Codes must be listed to attract suite red bottle required) or Dissolved (field uired).	Additional Information
LAB ID	SAMPLE ID	DATE /TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL CONTAINERS	PH (For)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
37	BH19-1.0	20-5/12:40	5	JAR + ASI		۷	/				
34	BH19-20						1				
35	BH19 - 3.0						/				
36	BH16 -0.1	20-1/14:10									
37	BM16 - 0.5										
38 3a	BH10 - 1-0										·
Sa	DM16 -5.0										
40	BN18 - 3.0										
41	MP05-210820	20-5/12:40									
41	Dulo6-210520	20-5/12:40									Forward to Euroffins
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46	BH2 -2.0										
41	BN21-3.0										
		and the second s			· · · · · · · · · · · · · · · · · · ·						
					TOTAL	70					

ALS Laboratory: please tick → CUSTODY CHAIN OF

CLIENT: WSP

ÜBRISBANE 32 Shand Street Stafford Qi**SDARIJEDURNE** 2-4 Westall Roeo Springwie VIO 3171 Ph: 07 3243 7222 E. samptes: brisbane@**ilsgji084/stAr**9600 E. samptes: melbourne@alsgjobal.com □GLADSTONE 48 Callemondan Drive Clinton QLD 4680 Ph. 07 7471 5600 E. gladstone@elsglobal.com DADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

TURNAROUND REQUIREMENTS:

□MUDGEE 27 Sydney Road Mudgee NSW 2850 Phr 02 6372 6735 E: mudgee.maii@aisglobal.com

OMACKAY 78 Harbour Road Mackay QLD 4740 Ph. 07 4944 0177 E. mackay@alsglobal com

□NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@atsqlobal.com ☐ TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville environmental@alsglobal com

DNEWICASTLE 5.686 Martiand Rd Mayfield West NSW 2204 DSYDNEY 277-269 Woodpark Road Smithfield NSW 2x64 Pp. 02 4014 2500 E. samples, newcastle@alegiobal.com Ph. 02 8784 8556 E. samples sydney@alegiobal.com □PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples:perth@alsg)

Black S. Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information Environmental Division Telephone: ~ 61-3-8549 9600 15 x 4 RECEIVED BY: DATE/TIME: Melbourne ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite جه price) . Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). Received: 1015 (1.30 Carrier: C1 ton) RELINQUISHED BY: DATE/TIME: COC SEQUENCE NUMBER Telmp: T. O C. Scal. CDC 1 2 3 4 5 DATE/TIME: RECEIVED BY: OF: 1 2 3 Standard TAT may be longer for some tests e.g.. Non Standard or urgent TAT (List due date): C/hote: (roy) Hg 举 Standard TAT (List due date) 70-02 RELINQUISHED BY: 5 35 TOTAL CONTAINERS DATE/TIME: TOTAL (refer to ۲ codes below) ALS QUOTE NO .: ME - 167 A55 TYPE & PRESERVATIVE SAMPLER MOBILE: OLILO 841 973 CONTACT PH: 0437 003 731 ٤ といっと 300 EDD FORMAT (or default): ٢ XIRTAN 4 Email Reports to (will default to PM if no other addresses are listed): Shanc 20-51 39:20 08:30 20-5 09:50 Email Invoice to (will default to PM if no other addresses are listed); accounts DATE / TIME 20-5 COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: PROJECT MANAGER: SHANE CILINEM OFFICER SOUTH ELAN LISHMAND DP03-210520 DJ634 - 21 0570 ORDER NUMBER: 73,24554 0-1 - 974B Dr. 2014 BA16 - 1.0 BH20 - 2.0 3.0 8H20 - 0.5 BAZE - 0.5 BH20 - 1.0 BATE - 0.1 8MJO - 2.0 Buts - J. a BH30 - 0.5 BH30 - 1.0 BH30 - 0.1 Phys . COC emailed to ALS? YES PROJECT: SAMPLER: LAB ID OFFICE: 0

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Water Container Codes: P = Unpreserved Plastic, N = Nitric Preserved Plastic, ORC = Nitric Preserved DRC: SH = Sodium Hydroxide Preserved: S = Sodium Hydroxide Preserved Plastic, AG = Amber Glass Unpreserved Plastic, N = VOA Vial Sulfuric Preserved; AV = VOA Vial Sulfuric Preserved; AV = VOA Vial Sulfuric Preserved Plastic; F = Formaldehyde Preserved Plastic; H = HCI preserved Bottles; ST = Steffie Bottles, SS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; B = Unpreserved Bottles; ST = Steffie Bottles, ASS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bottles; B =

CHAIN OF CUSTODY ALS Laboratory: please tick →

CLIENT: WSP

OFFICE:

SAMPLER:

<u>P</u>

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DBRISBANE 32 Shand Street Stefford Qu**©u40.33**QURNE 2-4 Westall Road Springvale VIC 3177. Ph. 07 3243 7222 E: samples brisbane@afbgjl08.**acbtw**0600 E: samples melbourne@afsgjl08.acbtw0600 E: ÜGLAØSTONE 45 Callemondah Drive Clinton QLD 4880 Phr 07 7471 5600 E; gladstone@alsglobal.com QADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

©MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph-02 6372 6735 E: mudgee.mail@alsglobal.com

塔 Standard TAT (List due date):

TURNAROUND REQUIREMENTS:

OTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph. 07 4798 0600 E: townsville.environmental@alegiobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkemble@alsglobal.com

DNEWGASTLE 5/R85 Majiland Rd Mayfield West NS/V 2304 - IISYDNEY 277-289 Woodpark Road Smithfield NS/V 2164 Ph. 02 4014 2500 E. samples newcastle@alsglobal.com Ph. 02 6754 8555 E. samples sydray@alsglobal.com ÜNOWRA 4/13 Geary Place North Nowra NSW 2541 Ph; 024423 2063 E: nowra@alsglobal.com ☐PERTH 10 Hod Way Malaga WA 6090 Pn: 08 9209 7655 E: samples.perth@alsglobal.com

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information RECEIVED BY: DATE/TIME: ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered hottle required) or Dissolved (field filtered bottle required). RELINQUISHED BY: DATE/TIME: COC SEQUENCE NUMBER RECEIVED BY: DATE/TIME: coc 1 2 0F: 1 2 Non Standard or urgent TAT (List due date): (my) Hd RELINQUISHED BY: TOTAL CONTAINERS 2 DATE/TIME: (refer to Standard TAT may be longer for some tests e.g.. TYPE & PRESERVATIVE codes below) A55 ٠ 3AR Ultra Trace Organics) ALS QUOTE NO.: EDD FORMAT (or default): SAMPLER MOBILE: XIATAM Ś CONTACT PH: (10:15 05.0 20-5/11:30 Email Invoice to (will default to PM if no other addresses are listed): accounts DATE / TIME 2 Email Reports to (will default to PM if no other addresses are listed): 20-5 COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: PROJECT: OFFICER JOUTH SAMPLE ID 7.0 ORDER NUMBER: P3124554 1342 - 2.0 e 2'e BH33 - 3.0 BA23 - 2.3 012 2CHC CH32 - 6.1 Ş BA31- 1.0 BH32 - D.1 BH32 - 3.5 1.0-42HB BH24-1.0 BM17 -0.5 ķ 6473 -COC emailed to ALS? YES PH 32 PH33 PROJECT MANAGER:

Water Container Codes: P = Unpreserved Plastic: N = Nitric Preserved DRC, SH = Sodium Hydroxide/Cd Preserved Plastic: AG = Amber Glass Unpreserved; AP - Antringibit Unpreserved; AV = Minitor Preserved; AV = Autringibit Unpreserved; AV = Autringibit Preserved Plastic: AV = Autringibit Unpreserved Plastic: F = Formaldehyde Preserved Sodium Studphate Preserved Bottles; ST = Steptile Bettles, AS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bag.

7

TOTAL

20-5 12:40 20-5-5

BH19 - D. 1

BX19-0.5

CUSTODY CHAIN OF

ALS Laboratory: please tick →

OFFICE

DADELAIDE 21 Burma Road Pooraka SA 5095 Ph; 08 8359 0890 E. adelaide@alsgiobal.com

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OTOWNSVILLE 14-15 Desma Court Bohle OLD 4818 Ph; 07 4796 0600 E: townsville environmental@alsglobal.com

EWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

□PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E. samples:perth@alsglobal.com

DNEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2804 OSYDNEY 277-289 Whodipark Road Smithfield NSW 2164 Ph. 02 4014 2500 E. samples newcastle@alsglobal.com Ph. 02 6784 8555 E. samples sydney@alsglobal.com

to Charles Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information RECEIVED BY: DATE/TIME: TOSE OF ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). RELINQUISHED BY: DATE/TIME: 9 9 COC SEQUENCE NUMBER 3 4 5 OF: 1 2 3 4 (Circle) RECEIVED BY: coc 1 2 DATE/TIME: ☐ Non Standard or urgent TAT (List due date): (yay) Hq Standard TAT (List due date): 2 RELINQUISHED BY: JATOT DATE/TIME: TOTAL (refer to (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) codes below) TURNAROUND REQUIREMENTS: TYPE & PRESERVATIVE ASS ٠ SE PE ALS QUOTE NO.: EDD FORMAT (or default): SAMPLER MOBILE: XIATAM CONTACT PH: 10.5 17.40 20-5/12:40 A: 21/5-02 20-5/14:30 Email Invoice to (will default to PM if no other addresses are listed): accounts DATE / TIME Email Reports to (will default to PM if no other addresses are listed): COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: NPOS-210820 Dulo6 - 210520 PROJECT: OFFICER SOUTH BN71-30 8 My -2-3 SAMPLE ID ORDER NUMBER: PS 124 554 BH2 - 0.5 のいしなける BH10-1.0 4,4 Bra 1 0.1 BH19 - 3.0 1.0- 9HB 8 MIG - 3.0 0.1 - CHE BH19-20 BM16 - 0.5 COC emailed to ALS? YES ØZ. PROJECT MANAGER: CLIENT: WSP SAMPLER: かつ LAB ID

5

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Socium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved Plastic; N = VCA Vial Socium Bisuphrate Preserved Vial Sulfuric Preserved Vial Sulfuric Preserved Vial Sulfuric Preserved Vial SC = Sulfuric Preserved Vial SC = Sulfuric Preserved Vial SC = Sulfuric Preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Vial SC = Sulfuric Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulptriate Solis; B = Unpreserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulptriate Solis; B = Unpreserved Bottles; ST = Sterile B



CERTIFICATE OF ANALYSIS

Work Order : EM2109392

: WSP Australia Pty Ltd

Contact : MR SHANE GILIAM

Address : Level 15, 28 Freshwater Place

SOUTHBANK VIC, AUSTRALIA 3006

Telephone : +61 03 9861 1111

Project : PS124554
Order number : PS124554

C-O-C number : ---

Client

Sampler : EL

Site : Officer South
Quote number : ME/167/21

No. of samples received : 45
No. of samples analysed : 21

Page : 1 of 7

Laboratory : Environmental Division Melbourne

Contact : Graeme Jablonskas

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +6138549 9609

Date Samples Received : 20-May-2021 17:30

Date Analysis Commenced : 25-May-2021

Issue Date : 25-May-2021 15:30

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

Dilani Fernando Senior Inorganic Chemist Melbourne Inorganics, Springvale, VIC

Page : 2 of 7

Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554

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

~ = Indicates an estimated value.

• ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme

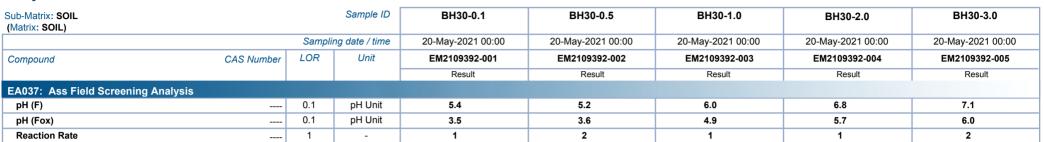
EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.



Page : 3 of 7
Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554





Page : 4 of 7
Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554

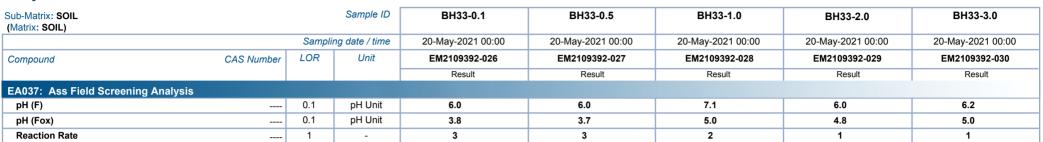




Page : 5 of 7
Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554

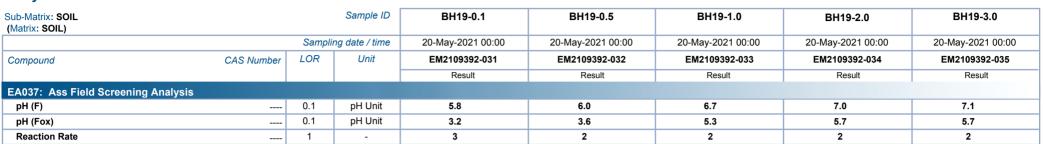




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Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554





Page : 7 of 7 : EM2109392

Work Order

: WSP Australia Pty Ltd Client

PS124554 Project







QUALITY CONTROL REPORT

Work Order : EM2109392

: WSP Australia Pty Ltd

Contact : MR SHANE GILIAM

Address : Level 15, 28 Freshwater Place

SOUTHBANK VIC, AUSTRALIA 3006

Telephone : +61 03 9861 1111

Project : PS124554 Order number : PS124554

C-O-C number : ----Sampler : EL

Site : Officer South
Quote number : ME/167/21

No. of samples received : 45 No. of samples analysed : 21 Page : 1 of 3

Laboratory : Environmental Division Melbourne

Contact : Graeme Jablonskas

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +6138549 9609
Date Samples Received : 20-May-2021
Date Analysis Commenced : 25-May-2021
Issue Date : 25-May-2021

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

Client

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

Dilani Fernando Senior Inorganic Chemist Melbourne Inorganics, Springvale, VIC

Page : 2 of 3 Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554



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

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 D	Ouplicate (DUP) Report		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA037: Ass Field So	creening Analysis (QC Lot:	3693252)							
EM2109392-001	BH30-0.1	EA037: Reaction Rate		1	-	1	1	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	5.4	5.4	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	3.5	3.5	0.0	0% - 20%
EM2109392-025	BH32-3.0	EA037: Reaction Rate		1	-	1	1	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	7.7	7.6	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	5.7	5.8	0.0	0% - 20%
EA037: Ass Field So	creening Analysis (QC Lot:	3693253)							
EM2109392-041	DUP05-210520	EA037: Reaction Rate		1	-	2	2	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	6.1	6.0	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	3.5	3.6	0.0	0% - 20%

Page : 3 of 3 Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554



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.

• No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.

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.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EM2109392** Page : 1 of 4

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact: MR SHANE GILIAMTelephone: +6138549 9609Project: PS124554Date Samples Received: 20-May-2021Site: Officer SouthIssue Date: 25-May-2021

Sampler : EL No. of samples received : 45
Order number : PS124554 No. of samples analysed : 21

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.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers: Analysis Holding Time Compliance

NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

• NO Quality Control Sample Frequency Outliers exist.

Page : 2 of 4
Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554



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 <u>VOC in soils</u> 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: x = Holding time breach ; ✓ = Within holding time.

							D. 00.0,	
Method	thod						Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis								
Snap Lock Bag - frozen on receipt at A	LS (EA037)							
BH30-0.1,	BH30-0.5,	20-May-2021	25-May-2021	16-Nov-2021	✓	25-May-2021	16-Nov-2021	✓
BH30-1.0,	BH30-2.0,							
BH30-3.0,	BH32-0.1,							
BH32-0.5,	BH32-1.0,							
BH32-2.0,	BH32-3.0,							
BH33-0.1,	BH33-0.5,							
BH33-1.0,	BH33-2.0,							
BH33-3.0,	BH19-0.1,							
BH19-0.5,	BH19-1.0,							
BH19-2.0,	BH19-3.0,							
DUP05-210520								

Page : 3 of 4
Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554



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: SOII

Evaluation: x = Quality Control frequency not within specification; √ = Quality Control frequency within specification.

Width X. GOIL				Lvaldatioi	i. • Quality Oc	introl inequency in	of Willin Specification, - Quality Control frequency Willin Specification.
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	OC	Reaular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	3	28	10.71	10.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 4 of 4 Work Order : EM2109392

Client : WSP Australia Pty Ltd

Project : PS124554



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
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Preparation Methods	Method	Matrix	Method Descriptions
Drying only	* EN020D	SOIL	In house



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2109498

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact : MR SHANE GILIAM Contact : Graeme Jablonskas

Address : Level 15, 28 Freshwater Place Address : 4 Westall Rd Springvale VIC Australia

3171

 Telephone
 : +61 03 9861 1111
 Telephone
 : +6138549 9609

 Facsimile
 : +61 03 9861 1144
 Facsimile
 : +61-3-8549 9626

Project : PS124554 Page : 1 of 4

SOUTHBANK VIC, AUSTRALIA 3006

 Order number
 : ====
 Quote number
 : EM2021PARBRIVIC0004 (ME/167/21)

 C-O-C number
 : ====
 QC Level
 : NEPM 2013 B3 & ALS QC Standard

Site : Officer South

Sampler : EL

Dates

Date

Delivery Details

 Mode of Delivery
 : Client Drop Off
 Security Seal
 : Not Available

 No. of coolers/boxes
 : 4
 Temperature
 : 6.7°C - Ice present

Receipt Detail : No. of samples received / analysed : 61 / 22

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 direct any queries related to sample condition / numbering / breakages to Client Services.
- Sample Disposal Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Analytical work for this work order will be conducted at ALS Springvale.
- 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 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.

Issue Date : 21-May-2021

Page

2 of 4 EM2109498 Amendment 0 Work Order Client : WSP Australia Pty Ltd



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			On Hold) SOIL	No analysis reqi SOIL - EA037 ASS Field Scree
Laboratory sample ID	Sampling date / time	Sample ID	O) H	No and SOIL - ASS F
EM2109498-001	21-May-2021 00:00	BH11-0.1		✓
EM2109498-002	21-May-2021 00:00	BH11-0.5		✓
EM2109498-003	21-May-2021 00:00	BH11-1.0		✓
EM2109498-004	21-May-2021 00:00	BH11-2.0		✓
EM2109498-005	21-May-2021 00:00	BH11-3.0		✓
EM2109498-006	21-May-2021 00:00	BH09-0.1	✓	•
EM2109498-007	21-May-2021 00:00	BH09-0.5	✓	
EM2109498-008	21-May-2021 00:00	BH09-1.0	✓	•
EM2109498-009	21-May-2021 00:00	BH09-2.0	✓	
EM2109498-010	21-May-2021 00:00	BH03-0.1		✓
EM2109498-011	21-May-2021 00:00	BH03-0.5		✓
EM2109498-012	21-May-2021 00:00	BH03-1.0		✓
EM2109498-013	21-May-2021 00:00	BH03-2.0		✓
EM2109498-014	21-May-2021 00:00	BH03-3.0		✓
EM2109498-015	21-May-2021 00:00	DUP07-210521		✓
EM2109498-016	21-May-2021 00:00	BH17-0.1		✓
EM2109498-017	21-May-2021 00:00	BH17-0.5		✓
EM2109498-018	21-May-2021 00:00	BH17-1.0		✓
EM2109498-019	21-May-2021 00:00	BH17-2.0		✓
EM2109498-020	21-May-2021 00:00	BH17-3.0		✓
EM2109498-021	21-May-2021 00:00	DUP09-210521		✓
EM2109498-022	21-May-2021 00:00	BH22-0.1	✓	
EM2109498-023	21-May-2021 00:00	BH22-0.5	✓	•
EM2109498-024	21-May-2021 00:00	BH22-1.0	✓	•
EM2109498-025	21-May-2021 00:00	BH22-2.0	✓	•
EM2109498-026	21-May-2021 00:00	BH14-0.1	✓	·
EM2109498-027	21-May-2021 00:00	BH14-0.5	✓	•
EM2109498-028	21-May-2021 00:00	BH14-1.0	✓	,
EM2109498-029	21-May-2021 00:00	BH14-2.0	✓	•
EM2109498-030	21-May-2021 00:00	BH06-0.1	✓	,
EM2109498-031	21-May-2021 00:00	BH06-0.5	✓	,
EM2109498-032	21-May-2021 00:00	BH06-1.0	✓	,
EM2109498-033	21-May-2021 00:00	BH06-2.0	✓	,
EM2109498-034	21-May-2021 00:00	BH43-0.1		✓
EM2109498-035	21-May-2021 00:00	BH43-0.5		✓

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eening Analysis

Issue Date : 21-May-2021

Page

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			(On Hold) SOIL No analysis requested	SOIL - EA037 ASS Field Screening Analysis
EM2109498-036	21-May-2021 00:00	BH43-1.0		✓
EM2109498-037	21-May-2021 00:00	BH43-2.0		✓
EM2109498-038	21-May-2021 00:00	BH43-3.0		1
EM2109498-039	21-May-2021 00:00	BH07-0.1	✓	
EM2109498-040	21-May-2021 00:00	BH07-0.5	✓	
EM2109498-041	21-May-2021 00:00	BH07-1.0	✓	
EM2109498-042	21-May-2021 00:00	BH07-2.0	✓	
EM2109498-043	21-May-2021 00:00	BH07-3.0	1	
EM2109498-044	21-May-2021 00:00	BH10-0.1	✓	
EM2109498-045	21-May-2021 00:00	BH10-0.5	✓	
EM2109498-046	21-May-2021 00:00	BH10-1.0	✓	
EM2109498-047	21-May-2021 00:00	BH10-2.0	✓	
EM2109498-048	21-May-2021 00:00	BH15-0.1	✓	
EM2109498-049	21-May-2021 00:00	BH15-0.5	✓	
EM2109498-050	21-May-2021 00:00	BH15-1.0	✓	
EM2109498-051	21-May-2021 00:00	BH15-2.0	✓	
EM2109498-052	21-May-2021 00:00	BH45-0.1	✓	
EM2109498-053	21-May-2021 00:00	BH45-0.5	✓	
EM2109498-054	21-May-2021 00:00	BH45-1.0	✓	
EM2109498-055	21-May-2021 00:00	BH45-2.0	✓	
EM2109498-056	21-May-2021 00:00	BH45-3.0	✓	
EM2109498-057	21-May-2021 00:00	BH38-0.1	✓	
EM2109498-058	21-May-2021 00:00	BH38-0.5	✓	
EM2109498-059	21-May-2021 00:00	BH38-1.0	✓	
EM2109498-060	21-May-2021 00:00	BH38-2.0	✓	
EM2109498-061	21-May-2021 00:00	BH38-3.0	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

: 21-May-2021 Issue Date

Page

: 4 of 4 : EM2109498 Amendment 0 Work Order Client : WSP Australia Pty Ltd



Requested Deliverables

Accounts PayableAU		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
EVAN LISHMUND		
- *AU Certificate of Analysis - NATA (COA)	Email	evan.lishmund@wsp.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	evan.lishmund@wsp.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	evan.lishmund@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	evan.lishmund@wsp.com
- Chain of Custody (CoC) (COC)	Email	evan.lishmund@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	evan.lishmund@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	evan.lishmund@wsp.com
SHANE GILIAM		
- *AU Certificate of Analysis - NATA (COA)	Email	shane.giliam@wsp.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	shane.giliam@wsp.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	shane.giliam@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	shane.giliam@wsp.com
- Chain of Custody (CoC) (COC)	Email	shane.giliam@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	shane.giliam@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	shane.giliam@wsp.com



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□ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

Ph: 07 4944 0177 E: mackay@atsglobal.com CIBRISBANE 32 Shand Street Stafford ON MED BOURNE 2-4 Westall Road Springvale VIC 3171

Ph: 07 3243 7222 E: samples.brisbane@stbgl0balsrx9r9600 E: samples melbourne@alsglobal.com LIGLADSTONE 46 Callemondah Drive Clinton QLD 4680

☐MUDGEE 27 Sydney Road Mudgee NSW 2850

☐MACKAY 78 Harbour Road Mackay QLD 4740

CONFINCASTLE 5/585 Mailtand Rd Mayfield West NSW 2304 IDSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph; 02 4014 2500 E: samples.newcastle@alsglobal.com

□NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

□PERTH 10 Hod Way Malaga WA 6090

Ph: 02 8784 8556 E: samples.sydney@alsglobal.com

CITOWNSVILLE 14-15 Desma Court Boble QLD 4818

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500

CLIENT:	please tick	→	TURN	AROUND REQUIREMENTS :	A Stone	TAT () iet	due date):	Fit. 08 9209 7033 E. Salinj	FOR LAB	ORATORYUSE ON	LY/(Circle)	
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LAB ID	SAMPLE ID	DATE /TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL	(m) Hd				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
1	BH 11 - 0-1	21-5 07:50	2	JAR + AIS		2.	1				Received: 21 S35.	
1	BH11 - 0.5						/				('/noto:	Carrier: (1), (1)
3	BH11-1-0										Temp: 67 °C Seal: (Ico) / Icebricks / NA	Carrier: Ck
4	BH11-2.5						/			(Ico / Icebricks / NA	ALS
5	BHU- 3.0						/					17 (100-407)
Ь	BN 39-0-1	21-5 08:30								Environt	mental Division	
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8	B409-1.0									Work C	order Reference	
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10	BH03-01	21-5 08:50]
11	BH07-0.5											<u> </u>
12	JN03 - 1.0						/					<u> </u>
17	13ho3-20						/			Telephone :	+ 61-3-8549 9600	
14	BN07-7.0											
TP	DUPO 14-210521						/				-	
	DUPO 8-2054						1				Forward to Eurofing	
					ATOT							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved Plastic; ORC = Nitric Preserved Plastic; ORC = Nitric Preserved Plastic; ORC = Nitric Preserved Plastic

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Scills; B = Unpreserved Bag.

V = VOA Vial HCI Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG. = Sulfuric Preserved Amber Glass; H = HCI preserved Plastic; HS = HCI preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved



CHAIN OF CUSTODY

ALS Laboratory:

DADELAIDE 21 Burma Road Popraka SA 5095 Ph: 08 8359 0890 E; adelaide@atsglobal.com

DMACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com □BRISBANE 32 Shand Street Stafford Quantation URNE 2-4 Westall Road Springvale VIC 3171
Ph. 77 3243 7222 F. samples prebaneの計論的8.#5成時800 E. samples meibourne@alsglobal.com

DGI ADSTONE 46 Callemondah Drive Clinton OLD 4680 Db: 07 7474 5800 E: gladelpoo@elegishel.com

DMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph; 02 6372 6735 E: mudgee.mail@alsglobal.com

DNEWCASTLE 5/585 Martland Rd Mayfield West NSW 2304 DSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

CINCIWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsolobal.com ☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 F: samples perth@alsglobal.com

Ph: 02 8784 8565 E; samples.sydney@alsglobal.com

BTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4798 0600 E: townsville environmental@alsglobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembls@alsglobel.com

	please tick →												
CLIENT:	WSP			ROUND REQUIREMENTS :		rd TAT (List	due date):			FOR LABORATORY USE OF			
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COMMENT	S/SPECIAL HANDLING/STORAGE OR DIS	SPOSAL:											
ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) SAMPLE®DETAILS CONTAINER*INFORMATION* Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field													
USE	MAJKIX SOLIDI(S)	WALFINITY						filtered	bottle requir	ed).			
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL	(And) Hd				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.		
16	13417-0-1	21-5 10:00	ß	JAR + AFI		2	/						
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(9	BH07-20												
8	Bn17 - 3.0						/		ļ <u>-</u>				
21	DUPO9 - 210521						/						
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22	BH22 - 0.1	21-5/10.20											
23	BHZZ ~ S.S	71-5											
24	BH22 - 1.0						-						
15	B422-200												
16	BH14-011	21-5/11:45	_										
77	BH14-0.5	477											
28	Bun - 1-0.								-		·		
29	BN14-2-P						1						
20	Brick - 04	21-5 (2:05			·								
					TOTAL								



CHAIN OF CUSTODY

ALS Laboratory:

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Ph. 07 4944 0177 E: mackay@alsqlobal.com

□BRISBANE 32 Shand Street Stafford QBD#D350URNE 2-4 Westall Road Springvale VIC 3171
Ph; 07 3243 7222 E. samples.brisbane@afbci08afbt@n680 E. samples melbourne@alsolobal.com

GRADSTONE 46 Callemondah Drive Clinton OLD 4680 Db. 67 7474 5600 E. pladetono@alegional.com

DMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

DNEWCASTLE 5/585 Maritiand Rd Mayfield West NSW 2304 DSYONEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

□NOWRA 4/13 Geary Place North Now/a NSW 2541 Ph: 024423 2063 E: nowra@alsolobal.com

OPERTH 10 Hod Way Malaga WA 6090
Ph: na 9209 7655 F: samples perth@alsglobal.com

TOWNSVILLE 14-15 Desma Court Boble QLD 4818
Ph: 07 4798 0500 E: lownsville.environmental@alsglobal.com

□WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

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LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTA	رك				dilutions, or samples requiring specific QC analysis etc.
			2			็อ็	₹				
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3	BH06-0.5	21-05/12:05	5	JAR + ASS	.,	2					
32	BH06 - 1.3										
33	BHO(-2.0										
34	13443 - 0-1	21-5 12:20					/				
35	BN40 - 0.5						/				
76	BN43 - 10						/				
27	B443 - 200						/				
38	B443 - 3.0										
38 3a	BN07-011	21-5 12:35									
40	Bno7-0.5										
41	BH07-1.0										
42	Bho7 - 200										
42 44 44	B407-3-0										
44	B410 - s.1	21-5 12:55	<u> </u>								
45	BN6 - 0.5										
45 46	By110 - 1.0				************						
					TOTAL						



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Pri: 07 4944 0177 E: mackav@alsolobal.com □BRISBANE 32 Shand Street Stafford CPD#即設OURNE 2-4 Westaff Road Springvale VIC 3171 Ph. 07 3243 7222 E: samples.brisbane@arbgibb#b#b#0600 E: samples.mcibourne@alsglobal.com

□GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee,mail@alsglobal.com

DMACKAY 78 Harbour Road Mackay OLD 4740

Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com DNOWRA 4/13 Geary Place North Nowre NSW 2541 Ph: 024423 2083 E: nowra@alsolobal.com

©PERTH 10 Hod Way Malaga: WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

DNEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 DSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph. 02 8784 8555 E: samples.sydney@alsglobal.com CITOWNSVILLE 14-15 Desma Court Boble QLD 4818 Ph; 07 4796 0600 E: townsville.environmental@alsglobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

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SAMPLER		SAMPLER M			RELINQUIS	SHED BY:		RECEIVE		4 5	V 1 (799)	UISHED BY:		RECEIVED BY:
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LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL CONTAINERS	(xw)Hd							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
47	BH10 - 2:0	21-5 12:58	٦	JAR + ASS		7								
us	BH15 - 8.1	21-5 13:15					1							
49	DN15 - 0.5	-					/							
8	BM15-1.0						1							
6	BH15-2-0						/							
52	BH45-0.1	21-5 13:50												
\mathcal{C}	BH45-0.5													
4	BH41-00													
55	BH45 - 2.0													
Z	BH45 - 70				,									
57	BH36-51	21-5 14:30											Ì	
87	PN78 - 0.5													
19	B438 - 1.0								į					
60	BN28-2.0													
61	BN38-7.0													
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DADELAIDE 21 BLITTRE Reas Poorate 54, 5005 The Reas State George E, adelation Gualder Casal Constitution of the Constitution	DATE /TIME MATERIAL COURS DELOW) 2.1-5 OP. 3.0 2.1-5 OP. 3.0 2.1-5 OP. 3.0	ropar, reserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Preserved; VS = VOA Vial Sulfuric Preserved; AV = Aufreight Unpreserved Vial SG = Sodium SI = Slanie Bottle, ASS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bag.
CHAIN OF STREAM CHAIN OF CUSTODY CLIENT: WSP OFFICE: PROJECT: & Fraction of the addresses are listed): accounts COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: CONTACT PH COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: COUNTACT PH CONTACT	LABID SAMPLEID 1 8411-0.1 2 8411-0.1 3 8411-1.0 4 841-2.0 6 8409-0.5 6 8409-0.5 6 8409-0.5 7 8403-0.1 6 8403-0.1 6 8403-0.1 7 8403-0.5 14 8403-1.0 7 8403-1.0 7 8403-1.0	V= VOA Vial HCI Preserved To Probeserved Plastic. N = Nitric Pl Z = Zino Acetate Preserved Bottle, E = EDTA Preserved Bottles, E = EDTA Preserved Bottles, S

CUSTODY CHAIN OF STATE TO SAME STATE TO SET TO STATE OF SET

CLIENT: WSP

ALS Laboratory: please tick →

⊐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

□ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsclobal.com

DMACKAY 78 Harbour Road Mackay QLD 4740 Pri: 07 4944 0177 E: mackay@alsglobal.com DBRISBANE 32 Shand Street Stafford OtsNABABOURNE 2-4 Westall Road Springvate VIC 3171 Pr. 07 3243 7222 E: samples bristante@bhgisbaβn800 E. samples.metboure@slagiobal.com

DMUDGEE 27 Sydney Road Mudgee NSW 2850 Pr. 02 6372 6735 E. mudgee.mail@alsglopal.com

▼ Standard TAT (List due date):

TURNAROUND REQUIREMENTS:

ONEWCASTLE 5/685 Mailland Rd Mayfield West N3W 2304 OSYDNEY 277/289 Woodpark Road Smithfield NSW 2164 Ph. 02 4014 2500 E; samples newcastle@alsgobal.com Ph. 02 8784 8555 E; samples sydney@asslobal.com DNOWRA 4/13 Geary Place North Nowra NSW 2541 Ph. 024423 2053 E: nowra@atsglobal.com ☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com DTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville environmental@elsglobal.com

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC, SH = Soutum Hydroxida/Cd Preserved; S = Soutum Hydroxida Preserved Flastic; AG = Amber Glass Unpreserved; AP - Airrieight Unpreserved; VS = VOA Vial Sulfurir Preserved; VS = VOA Vial Sulfurir Preserved; VS = VOA Vial Sulfurir Preserved; VS = VOA Vial Sulfurir Preserved Flastic; F = Formaldehyde Preserved Rodiale Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulprate Solis; B = Unpreserved Bag. Forward to Europhy Additional Information RECEIVED BY: DATE/TIME: ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite Where Motals are required, specify Total (unifilered bottle required) or Dissolved (field filtered bottle required). OF: 1 2 3 4 5 6 7 Other company RELINQUISHED BY: DATE/TIME: coc 1 2 3 4 5 6 7 COC SEQUENCE NUMBER RECEIVED BY: DATE/TIME: ☐ Non Standard or urgent TAT (List due date): (tas) Hd RELINQUISHED BY: CONTAINERS Ų JATOT DATE/TIME: (refer to (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) cades below) TYPE & PRESERVATIVE SAMPLER MOBILE: O426 891033 AB ÷ ALS QUOTE NO.: 98 EDD FORMAT (or default): つ **XI9TAM** CONTACT PH: 4-5 10:00 21-5-12 Email Invoice to (will default to PM if no other addresses are listed): accounts 22-51 11:45 DATE / TIME 5071) 5-17 Email Reports to (will default to PM if no other addresses are listed); ゲナン COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: PROJECT MANAGER: SHAPE CICLAM るうかれて てきり PROJECT: OFFICE SOUTH press - Losy Upo - 2/0521 ORDER NUMBER: PS 124554 SAMPLE ID BHUL -O. BAIM - CO. 3414-2.D BALL + 1.0 אים א זיאם BALL 200 Buck - 3.0 8422 - O.1 1.0 - MHD BM14-0.5 BH17-0.5 BHCF - 20 Bun- 1.0 (SHI7 - 0.1) COC emailed to ALS? YES SAMPLER: OFFICE: LABID ϱ 2 ۲ 5

CUSTODY CHAIN OF

※日本は、日本は、大学の日本を表するです。 下入行し、本当

CLIENT: WSP

OFFICE:

DADELAIDE 21 Burma Road Povatia SA 6065 DIAMCKAY 76 Haltour Road Machan Quil Pri: 06 8539 cale of 2 evaluation 20 pri: 06 8530 cale of 2 pri: 07 4544 0477 Erm deckagilational of Pri: 07 4544 0772 E. samples Lifsoane@abplobstachORNE 2-4 Vicesial Road Sampoure VIC 317 Ph. 07 3243 7722 E. samples Lifsoane@abplobstachObs Examples melicourre@abplobst com DADASTONE 4 Cellemontal Drive Clinical Quillon Quillon Quillon 20 4690 DIAMDGE 27 Sympy Road Mudgh DIAMDGE 27 Sympy Road Mudge Lifsoane

CIMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E. mudgee.mail@alsglobal.com OMACKAY 76 Harbour Road Mackay QLD 4740 Ph. 07 4944 0177 E. mackay@alsglobal.com

DNEWCASTLE 5/585 Maliland Rd Mayfreld West NSW 2004 IBSYDNEY 277-289 Woodpark Road Smithfeld NSW 2164 Ph. 02.4014 2500 E. samples newzasile@alsglobal.com Ph. 02.8784 8555 E. samples sydney@alsglobal.com DNOWRA 4/13 Ceary Place North Nowra NSW 2541 Ph; 024423 2063 E: nowra@alsglobal.com

DTOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph; 07 4796 0600 E: townsville, environmental@elsglobal.com

DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E. portkembla@alaglobal.com

□PERTH 10 Hod Way Malaga WA 6090 Ph. 08 9209 7655 E: samples.perth@alsglobal.com

RECEIVED BY: DATE/TIME: Coc 1 2 3 4 6 6 7 Random/Sample Temperature Control of the Control RELINQUISHED BY: DATE/TIME: COC SEQUENCE NUMBER RECEIVED BY: DATE/TIME: (Standard TAT may be longer for some tests e.g.. Non Standard or urgent TAT (List due date): Ultra Trace Organics) Standard TAT (List due date): RELINQUISHED BY: DATE/TIME: TURNAROUND REQUIREMENTS: ALS QUOTE NO.: EDD FORMAT (or default): SAMPLER MOBILE: CONTACT PH: Email Invoice to (will default to PM if no other addresses are listed): accounts Email Reports to (will default to PM if no other addresses are listed): PROJECT MANAGER: SHANK CILEPIN ALS Laboratory: please tick → ENAM LISHIMM PROJECT: OFFICER SOUTH ORDER NUMBER: PS/2-4554

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

COC emailed to ALS? YES

SAMPLER:

ALSE	SSAMELEDERALS:	ALSW WATERIWI		CONTAINERINFORMATIONE	, in		IS REQUIRED Metals are rec	including SU luired, specify filter	ITES (NB. Suite price) Fotal (unfiltered I ed bottle require	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unflitered bottle required) or Dissolved (field filtered bottle required).	suite Additional Information	formation
LAB ID	SAMPLE ID	DATE / TIME	XIЯТАМ ⊢	TYPE & PRESERVATIVE (re	ot refer to	CONTRINERS (XOT) NQ			· .		Comments on likely contaminant levels, diulions, or samples requiring specific QC analysis etc.	aminant levels, uiring specific QC
2	BH06-0.5	71-05/12:35	5	JAR + ASS	7							
5	(3 HOC - 1.2											
3	ghol - 2.0											1
失	18443 - 0.1	21-5 (12:20			-			-				
20	BNW - 0.5					\						
90	BM43 - 1.0				-	`						
7	BH43 . 2.0					`						
36	BH43 - 3.0					\						
7	BHO7-0.1	21-5/11:35										
3	13 Man - 0.5											
3	BH07-1.2	,										
ک	3407-20					-						
3	B407-3.0											
主	BM10 - 2.1	21-5 12:55										
7	BM6 / 6.5											
3	By10-10					-						
	and the second s				TOTAL	_						

Water Container Codes: P = Unpreserved Pisatic: NE Served Pisatic: ORC = Nitro Preserved ORC: SH = Sodium Hydroxide/Cd Preserved Pisatic; AG = Amber Glass Unpreserved Pisatic; AP - Airrieght Unpreserved Pisatic; FE = Formaldehyde Preserved
V = VAOA virial HCI Preserved Pisatic; AB = VAOA virial Pisatic; FE = Formaldehyde Preserved Pisatic; FE = Formaldehyde Preserved Pisatic; FE = Formaldehyde Preserved Pisatic; FE = FOTA Preserved Bottles; SP = Sulfuric Preserved Pisatic; FE = FOTA Preserved Bottles; ST = Sterile Bottle; ASS = Pisatic Bad for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

AND PRESENTATION OF STREET

CLIENT: WSP

OFFICE:

ALS Laboratory: please fick →

JBRISBANE 32 Shand Street Stafford Qu**DARIJE**OURNE 2-4 Westall Road Springvale VIC 31.71-Ph. 07 9243 7222 E: samples, brisbane@abgoba£for#n9600 E: samples melbourne@aleglobal.com DADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E. adetaide@atsglobal.com

JGLADSTONE 46 Callemondah Drive Clinton QLD 4680 Pr. 07 7471 5800 E. gladstone@elsglobal.com

Standard TAT (List due date):

TURNAROUND REQUIREMENTS:

ORDER NUMBER: PSILY 554

PROJECT MANAGER:

SAMPLER:

COC emailed to ALS? YES

DMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph; 02 6372 6735 E: mudgee.mail@alsglobal.com

DMACKAY 78 Harbour Road Mackay QLD 4740 Pb: 07 4944 0177 E. mackay@alsglobal.com

□NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph. 024423 2063 € nowra@alsglobal.com

OTOWNSVILLE 14-15 Desma Court Bohle OLD 4818 Ph. 07 4708 0600 E: townsville.en wronnental@alsglobal.com

DWOLLONGONG 99 Kenny Street Woltongong NSW 2500 Ph. 02 4225 3125 E. portkembla@alsglobal.com

DNEWCASTLE 5.685 Mattend Rd Mayfield West NSW 2304. IDSYDNEY 277.289 Woodpark Road Smithfield NSW 2164. Ph. 02 4014 2500 E. samples.newcastle@alsglobal.com Ph. 02 8784 8556 E. samples.sydney@alsglobal.com □PERTH 10 Hod Way Malaga WA 3090 Ph: 08 9209 7855 E: samples perth@alsglobal.com

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Additional Information RECEIVED BY: DATE/TIME: ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). RELINQUISHED BY: DATE/TIME: 2 9 2 9 COC SEQUENCE NUMBER 3 4 5 3 4 5 (Circle) RECEIVED BY: coc 1 2 OF: 1 2 DATE/TIME: Non Standard or urgent TAT (List due date): (xex)Hd RELINQUISHED BY: TOTAL CONTAINERS 7 DATE/TIME: (refer to Standard TAT may be longer for some tests e.g... Jitra Trace Organics) ASS TYPE & PRESERVATIVE codes below) Ŧ 3 AR ALS QUOTE NO.: EDD FORMAT (or default): SAMPLER MOBILE: XIATAM لے CONTACT PH: 3:50 21-5/14:30 21-5 13:15 71-5 17:58 Email Invoice to (will default to PM if no other addresses are listed): accounts DATE / TIME Email Reports to (will default to PM if no other addresses are listed): 2:-5 SAMPLE DETAILS COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: PROJECT: OFFICER SOUTH

SAMPLE ID

₽ PB

BM10 - 2.0

2415 - 2.1

É

Water Container Codes: P = Uppreserved Plastic, N = Nitric Preserved Plastic, NC = Nitric Preserved ORC, SH = Socium Hydroxide Preserved Plastic, AG = Amber Glass: Uppreserved Plastic, NG = VOA Vial Sulfuric Preserved AV = Airfielght Unpreserved AV = Airfielght Uppreserved Vial SG = Sulfuric Preserved Plastic; HC Preserved Speciation bottle, SP = Sulfuric Preserved Plastic, F = Formaldehyde Preserved Preserved Plastic SG = Sulfuric Preserved Bottles, ST = Starie Bottle, ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

BM36-2.0

و

BN78-2.0 BH38 - 1.0

8478 - 0.5

5 و

8-0-5HB 8x45-80

PHIS - 2.0 8H46-0-1

BM15-1.0 DHIS - D. S

BAWS - 73 BM30101

84x8 - 2.0

£



CERTIFICATE OF ANALYSIS

Work Order : EM2109498

: WSP Australia Pty Ltd

Contact : MR SHANE GILIAM

Address : Level 15, 28 Freshwater Place

SOUTHBANK VIC, AUSTRALIA 3006

Telephone : +61 03 9861 1111

Project : PS124554

Order number : ---C-O-C number : ----

Client

Sampler · EL

Site : Officer South

Quote number : ME/167/21

No. of samples received : 61

No. of samples analysed : 22

not be reproduced, except in full

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

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

Nikki Stepniewski Senior Inorganic Instrument Chemist Melbourne Inorganics, Springvale, VIC

Page

Address : 4 Westall Rd Springvale VIC Australia 3171

: Graeme Jablonskas

: Environmental Division Melbourne

: 1 of 7

Telephone : +6138549 9609

Date Samples Received : 21-May-2021 15:35

Date Analysis Commenced : 25-May-2021

Issue Date : 27-May-2021 08:34

Page : 2 of 7

Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554

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

~ = Indicates an estimated value.

• ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme

EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.

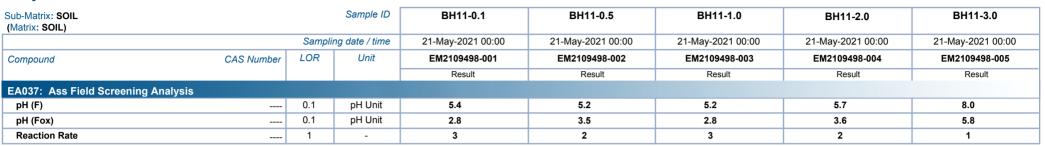


Page : 3 of 7

Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554



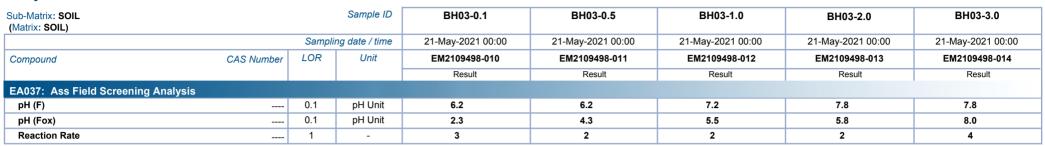


Page : 4 of 7

Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554

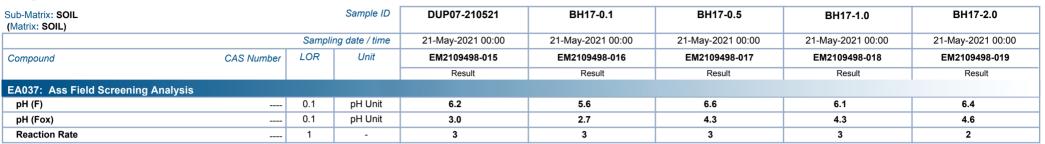




Page : 5 of 7
Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554

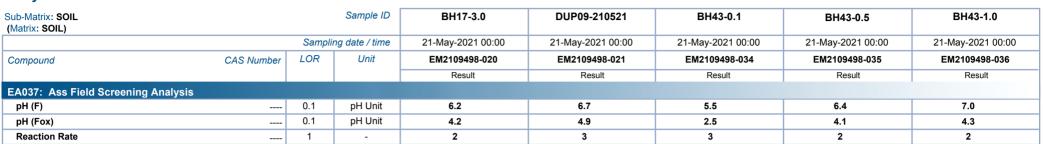




Page : 6 of 7
Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554



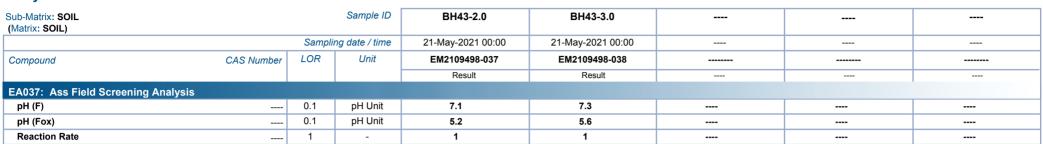


Page : 7 of 7

Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554







QUALITY CONTROL REPORT

Work Order : **EM2109498**

: WSP Australia Pty Ltd

Contact : MR SHANE GILIAM

Address : Level 15, 28 Freshwater Place

SOUTHBANK VIC, AUSTRALIA 3006

Telephone : +61 03 9861 1111

Project : PS124554

Order number : --C-O-C number : ---

Client

Sampler ; EL

Site : Officer South
Quote number : ME/167/21

No. of samples received : 61
No. of samples analysed : 22

Page : 1 of 3

Laboratory : Environmental Division Melbourne

Contact : Graeme Jablonskas

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +6138549 9609
Date Samples Received : 21-May-2021
Date Analysis Commenced : 25-May-2021
Issue Date : 27-May-2021

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

Nikki Stepniewski Senior Inorganic Instrument Chemist Melbourne Inorganics, Springvale, VIC

Page : 2 of 3 Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554



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

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 L	Duplicate (DUP) Report		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA037: Ass Field S	creening Analysis (Q0	C Lot: 3695926)							
EM2109418-003	Anonymous	EA037: Reaction Rate		1	-	4	4	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	8.6	8.6	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	7.7	7.8	0.0	0% - 20%
EM2109498-011	BH03-0.5	EA037: Reaction Rate		1	-	2	2	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	6.2	6.3	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	4.3	4.3	0.0	0% - 20%
EA037: Ass Field S	creening Analysis (Q0	C Lot: 3695927)							
EM2109498-034	BH43-0.1	EA037: Reaction Rate		1	-	3	3	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	5.5	5.5	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	2.5	2.5	0.0	0% - 20%
EM2109521-028	Anonymous	EA037: Reaction Rate		1	-	2	2	0.0	No Limit
		EA037: pH (F)		0.1	pH Unit	7.2	7.2	0.0	0% - 20%
		EA037: pH (Fox)		0.1	pH Unit	3.6	3.5	3.6	0% - 20%

Page : 3 of 3 Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554



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.

• No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.

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.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EM2109498** Page : 1 of 4

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact: MR SHANE GILIAMTelephone: +6138549 9609Project: PS124554Date Samples Received: 21-May-2021Site: Officer SouthIssue Date: 27-May-2021

Sampler : EL No. of samples received : 61
Order number : --- No. of samples analysed : 22

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.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers: Analysis Holding Time Compliance

NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

• NO Quality Control Sample Frequency Outliers exist.

Page : 2 of 4
Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554



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 <u>VOC in soils</u> 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		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis								
Snap Lock Bag - frozen on receipt at Al	.S (EA037)							
BH11-0.1,	BH11-0.5,	21-May-2021	25-May-2021	17-Nov-2021	✓	26-May-2021	17-Nov-2021	✓
BH11-1.0,	BH11-2.0,							
BH11-3.0,	BH03-0.1,							
BH03-0.5,	BH03-1.0,							
BH03-2.0,	BH03-3.0,							
DUP07-210521,	BH17-0.1,							
BH17-0.5,	BH17-1.0,							
BH17-2.0,	BH17-3.0,							
DUP09-210521,	BH43-0.1,							
BH43-0.5,	BH43-1.0,							
BH43-2.0								
Snap Lock Bag - frozen on receipt at Al	.S (EA037)							
BH43-3.0		21-May-2021	26-May-2021	17-Nov-2021	✓	26-May-2021	17-Nov-2021	✓

Page : 3 of 4
Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554



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.

Wattist COIL				Lvalaatioi	i. Quality Oc	ontrol frequency fr	duality Control in equality within opcomoducin.
Quality Control Sample Type		Co	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	OC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	4	30	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 4 of 4 Work Order : EM2109498

Client : WSP Australia Pty Ltd

Project : PS124554



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
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Preparation Methods	Method	Matrix	Method Descriptions
Drying only	* EN020D	SOIL	In house



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2109607

Amendment : 1

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact : MR SHANE GILIAM Contact : Graeme Jablonskas

Address : Level 15, 28 Freshwater Place Address : 4 Westall Rd Springvale VIC Australia

SOUTHBANK VIC, AUSTRALIA 3006 3

 Telephone
 : +61 03 9861 1111
 Telephone
 : +6138549 9609

 Facsimile
 : +61 03 9861 1144
 Facsimile
 : +61-3-8549 9626

Project : PS124554 Page : 1 of 3

 Order number
 : -- Quote number
 : EM2021PARBRIVIC0004 (ME/167/21)

 C-O-C number
 : -- QC Level
 : NEPM 2013 B3 & ALS QC Standard

Site : Officer South
Sampler : EVAN LISHMUND

Dates

Date

Delivery Details

 Mode of Delivery
 : Carrier
 Security Seal
 : Not Available

 No. of coolers/boxes
 : 4.3°C - Ice present

Receipt Detail : No. of samples received / analysed : 38 / 25

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 direct any queries related to sample condition / numbering / breakages to Client Services.
- Sample Disposal Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Analytical work for this work order will be conducted at ALS Springvale.
- 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 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.

Issue Date : 31-May-2021

Page

: 2 of 3 : EM2109607 Amendment 1 Work Order Client : WSP Australia Pty Ltd



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

ing Analysis

• 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	Sampling date / time	Sample ID	On Hold) SOIL No analysis reques	SOIL - EA037 ASS Field Screeni
EM2109607-001	24-May-2021 08:18	BH42-0.1	02	✓
EM2109607-002	24-May-2021 08:18	BH42-0.5		1
EM2109607-003	24-May-2021 08:18	BH42-1.0		1
EM2109607-004	24-May-2021 08:18	BH42-2.0		✓
EM2109607-005	24-May-2021 08:18	BH42-3.0		✓
EM2109607-006	24-May-2021 08:35	BH36-0.1		1
EM2109607-007	24-May-2021 08:35	BH36-0.5		✓
EM2109607-008	24-May-2021 08:35	BH36-1.0		✓
EM2109607-009	24-May-2021 08:35	BH36-2.0		✓
EM2109607-010	24-May-2021 08:35	BH36-3.0		✓
EM2109607-011	24-May-2021 09:00	BH35-0.1	✓	
EM2109607-012	24-May-2021 09:00	BH35-0.5	✓	
EM2109607-013	24-May-2021 09:00	BH35-1.0	✓	
EM2109607-014	24-May-2021 09:00	BH35-2.0	✓	
EM2109607-015	24-May-2021 09:20	BH44-0.1		✓
EM2109607-016	24-May-2021 09:20	BH44-0.5		1
EM2109607-017	24-May-2021 09:20	BH44-1.0		✓
EM2109607-018	24-May-2021 09:20	BH44-2.0		1
EM2109607-019	24-May-2021 09:20	BH44-3.0		✓
EM2109607-020	24-May-2021 09:40	BH31-0.1	✓	
EM2109607-021	24-May-2021 09:40	BH31-0.5	✓	
EM2109607-022	24-May-2021 09:40	BH31-1.0	✓	
EM2109607-023	24-May-2021 09:40	BH31-2.0	✓	
EM2109607-024	24-May-2021 10:10	BH34-0.1		✓
EM2109607-025	24-May-2021 10:10	BH34-0.5		✓
EM2109607-026	24-May-2021 10:10	BH34-1.0		1
EM2109607-027	24-May-2021 10:10	BH34-2.0		✓
EM2109607-028	24-May-2021 10:10	BH34-3.0		✓
EM2109607-029	24-May-2021 10:35	BH37-0.1	✓	
EM2109607-030	24-May-2021 10:35	BH37-0.5	✓	
EM2109607-031	24-May-2021 10:35	BH37-1.0	✓	
EM2109607-032	24-May-2021 10:35	BH37-2.0	✓	
EM2109607-033	24-May-2021 10:35	BH37-3.0	✓	
EM2109607-034	24-May-2021 11:20	BH28-0.1		✓
EM2109607-035	24-May-2021 11:20	BH28-0.5		✓

Issue Date : 31-May-2021

Page

3 of 3 EM2109607 Amendment 1 Work Order Client : WSP Australia Pty Ltd



			On Hold) SOIL	No analysis requested	SOIL - EA037 ASS Field Screening Analysis
EM2109607-036	24-May-2021 11:20	BH28-1.0			✓
EM2109607-037	24-May-2021 11:20	BH28-2.0			✓
EM2109607-038	24-May-2021 11:20	BH28-3.0			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

·		
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
EVAN LISHMUND		
 *AU Certificate of Analysis - NATA (COA) 	Email	evan.lishmund@wsp.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	evan.lishmund@wsp.com
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	evan.lishmund@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	evan.lishmund@wsp.com
- Chain of Custody (CoC) (COC)	Email	evan.lishmund@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	evan.lishmund@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	evan.lishmund@wsp.com
SHANE GILIAM		
 *AU Certificate of Analysis - NATA (COA) 	Email	shane.giliam@wsp.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	shane.giliam@wsp.com
 *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) 	Email	shane.giliam@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	shane.giliam@wsp.com
- Chain of Custody (CoC) (COC)	Email	shane.giliam@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	shane.giliam@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	shane.giliam@wsp.com

CONTRACTOR STATEMENT OF THE STATEMENT OF

ORDER NUMBER: PSIZ4154

PROJECT: OFFI CER SOUTH

OFFICE: CLIENT:

WSP

PROJECT MANAGER: JANE

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CONTACT PH:

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ALS QUOTE NO : ME - 169 - 2

(Standard TAT may be longer for some tests e.g.. Non Standard or urgent TAT (List due date):

TURNAROUND REQUIREMENTS:

Email Invoice to (will default to PM if no other addresses are listed); accounts Email Reports to (will default to PM if no other addresses are listed): COC emailed to ALS? YES

SAMPLER:

EUNTY LIGHTIMUND

SAMPLER MOBILE: OYCL 891 033

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COC SEQUENCE NUMBER

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ALS Laboratory: please tick →

□GLADSTONE 46 Callemondath Drive Clinton QLD 4680 Ph; 07 7471 5600 E. gladstone@alsglobal.com □BRISBANE 32 Shand Sireet Stafford ObJMELECURNE 2-4 Westell Road Springvale VIC 317* Ph: 07 3243 7222 E. samples bnsbane©記載的b最短載的600 E: samples melbourne@aksglobal.com QADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com ☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

IMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

□PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

UNOWRA 4/13 Geary Place North Nowa NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

QNEWCASTLE 5:855 Mailland Rd Mayfield West NSW 2304 LISYDNEY 277-289 Woodpark Road Smithfield NSW 2104 Ph 102 4914 2500 E. samples newcastle@alsylobal.com Ph 102 8764 8555 E. samples sydney@alsylobal.com 日下OWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville environmental優atsglobal com ⊒WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

RELINQUISHED BY: RECEIVED BY: Moore

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved 2 6 COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: $\bar{\omega}$ 0 4 0 00 LAB ID در 9 4 0 BH42-01 SHUL O.S BH36 - 2-3 3x36 - 3,6 はれていい 3.0-nhx 1.0 - hAHB BH34 . 1.0 3MJ8 - 0.5 BM36 - 0.1 8436 - 2.5 BH36 -0.1 3747・30 BH47 - 20 BH35- 2.0 BHX-1.0 SAMPLE ID 24-5 05:20 24-5/08:35 24-5/01:20 24-5/08:15 DATE / TIME C MATRIX TYPE & PRESERVATIVE ひろう codes below) يك IOIA (refer to TOTAL CONTAINERS 3 ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite py (Fox) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). Received: 941 ^{felephone}: +81-3-8549 960(Melbourne EM2109607 Environmental Division analysis etc. Comments on likely contaminant levels, dilutions, or samples requiring specific QC Additional Information

V = VOA Vial HCI Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solis; B = Unpreserved Bag.

Amber Glass;

Preserved Plastic: AG = Amber Glass Unpreserved

BINCUmbinisher, Med; Plastic V /

tion bottle; SP = Sulfuric Preserved Plastic;

H = HCl preserved Plastic; HS = HCl pres

ENTRACTORED STEELS

CUSTODY CHAIN OF ALS Laboratory: please tick →

PubELAIDE 21 Burma Road Pornès S.A. 8995
Ph. 108 8259 6890 E. adelade@alsglobal.com
Ph. 108 8259 6890 E. adelade@alsglobal.com
Ph. 107 4944 0177 E. mackay@alsglobal.com
Ph. 107 4944 0177 E. mackay@alsglobal.com
Ph. 107 3243 7272 E. samples, brishane@alsglobal.adelae000 E. samples melbourne@alsglobal.com LIGLADSTONE 46 Callemondah Drive Clinton QLD 4880 Ph: 07 7471 5800 E: gladstone@alsglobal.com DMACKAY 78 Harbour Road Mackay QLO 4746 Ph: 07 4944 0177 E: mackay@alsglobal.com

OMUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 8372 6735 E: mudgee mail@alsglobal.com

LIPERTH 10 Hod Way Malega, WA 6090 Ph: 08 9209 7655 E: samples perth@alsglobal.com ENOWRA 4/13 Gebry Place North Nowre NSW 2541 Ph: 024423 2063 E: nowre@alsglobal.com

LINEWCASTLE 5/585 Mantand Rd. Mayfield Wisst NSW 2304 LISYDNEY 277-280 Woodpark Road Smithfield NSW 2164 Ph. 02 4014 2500 E. samples.newcastle@alsglobal.com Ph. 02 8784 855 E. samples.synrey@alsglobal.com ©TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E. townsville environmental@alegiobal.com EWOLLONGONG 98 Kenny Street Wollongong NSW 2500

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Email Invoice to (will default to PM if no other addresses are listed): accounts Email Reports to (will default to PM if no other addresses are listed):

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COC emailed to ALS? YES

PROJECT MANAGER:

ORDER NUMBER: PS124554 PROJECT: OFFICER

SOUTH

TURNAROUND REQUIREMENTS:

OFFICE: CLIENT: WSP

SAMPLER:

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22	RH31- 1.0				
133	13H31- 2.0				
24	BH34 - 0.1	24-5 10-5			
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27	BH34-2.0				
8	BH34-3.				
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			, and and	Proventeur Plastic; HS = HC/ preserved Speciation	Transic; HS = HC) preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserve;

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□ADELAIDE 21 Burma Road Pooraka SA 5095 Ph. 08 8359 0890 E: adelaide@alsglobal.com

Sodium Hydroxide Presarved Plastic, AG = Amber Glass Unpreserved, AP - Alifreight Unpreserved Plastic	S = Sodium Hydroxide Preserved Plastic; AG ulfunic Preserved Amber Glass; H = HCl prese	ved; AV = Airfreight Unpreserved Vial SG = S. Acid Sulphate Solls; B = Unpreserved Bag.	erved; VS = VOA Vial Sulfuric Preser Sterile Bottle; ASS = Plastic Bag fo	ate Preserved Bottle; E = EDTA Preserved Bottles; ST =
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PROJECT MANAGER: JHANE GILLAN ORDER NUMBER: PSILUSSY PROJECT: OFFI CER JUSTA CLIENT: WSP Water Container Codes: P = Unpreserved Plastic; N = Nitrio Preserved Plastic; ORC = Nitrio Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S ら COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Email Invoice to (will default to PM if no other addresses are listed): accounts Email Reports to (will default to PM if no other addresses are listed): COC emailed to ALS? YES SAMPLER: 7 LAB ID THE REPORT OF THE PARTY AND THE PARTY AND THE 12 5 S ه B _ 4 <u>___</u> 6 9 Z SHUL O.S BHYL- OIL EWAN LIMMUND のスキュートの 8442 - 2.0 BM34 - 7- 2 8436 - 2.5 3742 · 3:0 5775 - J.6 BH36 - 0.1 BMJ8 - 0.5 BM36 - 0.1 S-0- LAND 0435 - 1.0 BH36-10 20- 3470 5.4 - 5KB SAMPLE ID CUSTODY CHAIN OF ALS Laboratory please tick 3 24-5/08:35 24-2 /01:20 24-5/08:15 24-5/01:20 DATE / TIME SAMPLER MOBILE: OYLL 841 033 CONTACT PH: EDD FORMAT (or default): でくら DGLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph. 07 7471 5600 E. gladstone@alsglobal.com □BRISBANE 32 Shand Street Stafford DISD/#IDEOURNE 2-4 Westall Road Springvale VIC 3171 Ph. 07 3243 7222 E: samples.brisbane@afkgi05.454090600 E: samples melbourne@akgiobal.com OADELAIDE 21 8urms Road Poorska SA 5095 Ph. 08 8359 0890 E: adeleide@alsglobal.com (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) ALS QUOTE NO .: ME - 164 - 2 TURNAROUND REQUIREMENTS: C MATRIX しょうくらゅうらんの عمدماد TYPE & PRESERVATIVE 公かる CONTAINER INFORMATION + codes below) Αŭ ⊒MACKAY 78 Harbour Road Mackay OLD 4740 Ph: 07 4044 0177 E: mackay@alsglobat.com ☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph; 02 6372 6735 €: mudgee.mail@alsglobal.com DATE/TIME: ☐ Non Standard or urgent TAT (List due date): RELINQUISHED BY: CUAL LIMALIVE (refer to TOTAL TOTAL CONTAINERS 3 sn:h1 ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite py (Fox) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). COC 1 2 OF: 1 2 3 4 5 RECEIVED BY: DATE/TIME: □NEWCASTLE 5585 Mailland Rd Mayfield West NSW 2304. □SYDNEY 277-289 Woodpark Road Smithfield NSW 2164. Ph. 02 4014 2500 E. samples.newcastle@alsglobal.com Ph. 02 8784 8555 E. samples.nydney@alsglobal.com □PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9299 7655 E: samples.perth@alsglobal.com DNOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com COC SEQUENCE NUMBER DATE/TIME RELINQUISHED BY: Received: 9413 Temps: 4-3 C Stall A (M) ^{Telephone}: +61-3-8549 960(QTOWNSVILLE 14-15 Desma Court Boble QLD 4818 Ph; 07 4798 0600 E: townsville environmental@alsglobal.com DWOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph; 02 4225 3125 E portkembla@alsglobal.com Melbourne Environmental Division EM2109607 Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. DATE/TIME: RECEIVED BY: Additional Information Moon

V = VOA VIal HCI Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA VIal Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Solls; B = Unpreserved Bag.

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ation bottle; SP = Sulfuric Preserved Plastic;

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ALS Laboratory: please tick →

Email Invoice to (will default to PM if no other addresses are listed): accounts Email Reports to (will default to PM if no other addresses are listed): COC emailed to ALS? YES

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SAMPLER: PROJECT MANAGER:

ORDER NUMBER: PS124554

PROJECT: OFFICE: CLIENT: WSP

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LIGLADSTONE 48 Callemondah Drive Clinton QLD 4580 Ph; 07 7471 5500 E: gladstone@alsglobal.com □BRISBANE 32 Shand Sireot Statford QI**級NELED**URNE 2-4 Westall Road Springvale VIC 3171 Ph. 07 3243 7222 E: samples.bisbane**@ Blogdea5s6n**8000 E: samples.malbourne**@alsglobal**.com □ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com □MACKAY 78 Harbour Road Mackay OLD 4749 Ph: 07 4944 0177 E: mackay@alsglobal.com

(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)

☐ Non Standard or urgent TAT (List due date):

COC 1 2

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COC SEQUENCE NUMBER

★ Standard TAT (List due date):

TURNAROUND REQUIREMENTS:

ALS QUOTE NO.:

©MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

□PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 Ei samples,perth@alsglobal.com

- CINKWYCASTILE 5/685 Kasitand Rd Mayfield West NSW 2304 - DSYDNEY 277-269 Woodpark Road Smithleid NSW 2164 Ph. 02.4014 2500 E. samples newcastif@alsglobal.com Ph. 02.8184 6555 E. samples sydney@asglobal.com Ph. 02.8185 6 OTOWNSVILLE 14-15 Desma Court Bonke QLD 4818 Ph 07 4796 0600 E lawnsville environmental@alsglaba: com @WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglabal.com

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18 BH44-2.0	•					
19 BAN4-30						
20 BH31 - O. 1	24-5 01:40					
21 BH21 -0.5	-					
22 RH31-1.0						
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24 BH34 - 0.1	24-5 10:10					
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31 BHJ7 -1.0						
32 8437 ,200						
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CERTIFICATE OF ANALYSIS

Work Order : **EM2109607** Page : 1 of 7

Amendment : 1

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact : MR SHANE GILIAM Contact : Graeme Jablonskas

Address : Level 15, 28 Freshwater Place Address : 4 Westall Rd Springvale VIC Australia 3171

SOUTHBANK VIC, AUSTRALIA 3006

 Telephone
 : +61 03 9861 1111
 Telephone
 : +6138549 9609

 Project
 : PS124554
 Date Samples Received
 : 24-May-2021 14:45

Order number : ---C-O-C number : ----

C-O-C number : ---- Issue Date : 31-May-2021 12:06
Sampler : EVAN LISHMUND
Site : Officer South

Quote number : ME/167/21

No. of samples received : 38

No. of samples analysed : 25

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.

Date Analysis Commenced

: 27-May-2021

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

Arenie Vijayaratnam Non-Metals Team Leader Melbourne Inorganics, Springvale, VIC

Page : 2 of 7

Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554



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.

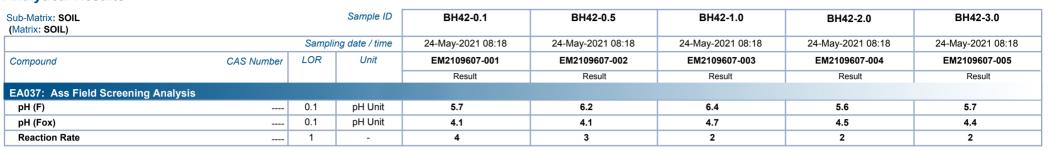
LOR = Limit of reporting

- ^ = This result is computed from individual analyte detections at or above the level of reporting
- ~ = Indicates an estimated value.
- Amendment (31/5/21):This report has been amended following the correction of sample IDs to BH34-0.1 (#24) and BH34-0.5 (#25). All results remained unchanged.
- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 Slight; 2 Moderate; 3 Strong; 4 Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.

Page : 3 of 7

Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554

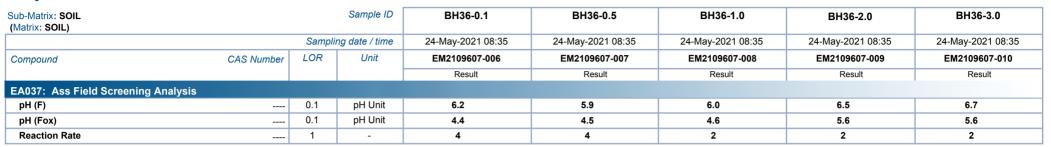




Page : 4 of 7

Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554

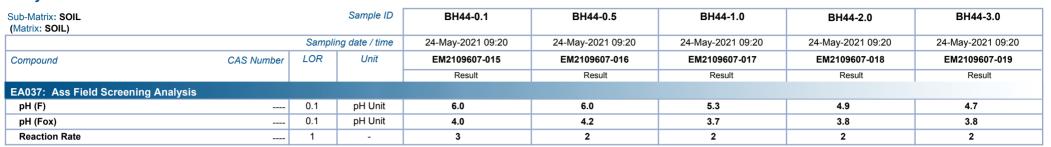




Page : 5 of 7

Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554

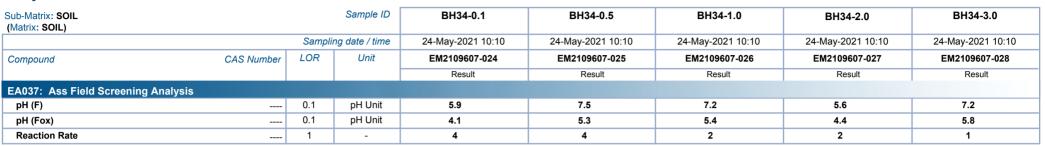




Page : 6 of 7

Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554

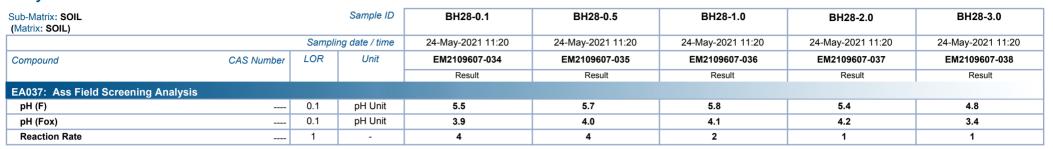




Page : 7 of 7

Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554







QUALITY CONTROL REPORT

: +6138549 9609

Work Order : **EM2109607** Page : 1 of 3

Amendment : 1

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact : MR SHANE GILIAM Contact : Graeme Jablonskas

Address : Level 15, 28 Freshwater Place Address : 4 Westall Rd Springvale VIC Australia 3171

SOUTHBANK VIC, AUSTRALIA 3006

Telephone : +61 03 9861 1111 Telephone

Project: PS124554Date Samples Received: 24-May-2021Order number: ----Date Analysis Commenced: 27-May-2021

C-O-C number Issue Date 31-May-2021

Sampler : EVAN LISHMUND
Site : Officer South

Quote number : ME/167/21
No. of samples received : 38

No. of samples received : 38

No. of samples analysed : 25

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

Arenie Vijayaratnam Non-Metals Team Leader Melbourne Inorganics, Springvale, VIC

Page : 2 of 3

Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554



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

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 (%)		
EA037: Ass Field So	creening Analysis (QC Lot:										
EM2109607-001 BH42-0.1 EA037: Reaction		EA037: Reaction Rate		1	-	4	4	0.0	No Limit		
		EA037: pH (F)		0.1	pH Unit	5.7	5.8	2.1	0% - 20%		
		EA037: pH (Fox)		0.1	pH Unit	4.1	4.4	8.0	0% - 20%		
EM2109607-010	BH36-3.0	EA037: Reaction Rate		1	-	2	2	0.0	No Limit		
		EA037: pH (F)		0.1	pH Unit	6.7	6.8	0.0	0% - 20%		
		EA037: pH (Fox)		0.1	pH Unit	5.6	5.6	0.0	0% - 20%		
EA037: Ass Field So	creening Analysis (QC Lot:	3698440)									
EM2109607-034	BH28-0.1	EA037: Reaction Rate		1	-	4	4	0.0	No Limit		
		EA037: pH (F)		0.1	pH Unit	5.5	5.6	0.0	0% - 20%		
		EA037: pH (Fox)		0.1	pH Unit	3.9	3.9	0.0	0% - 20%		

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Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554



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.

• No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.

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.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EM2109607** Page : 1 of 4

Amendment : 1

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact: MR SHANE GILIAMTelephone: +6138549 9609Project: PS124554Date Samples Received: 24-May-2021Site: Officer SouthIssue Date: 31-May-2021

Sampler : EVAN LISHMUND No. of samples received : 38
Order number : ---- No. of samples analysed : 25

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.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers: Analysis Holding Time Compliance

NO Analysis Holding Time Outliers exist.

Outliers: Frequency of Quality Control Samples

• NO Quality Control Sample Frequency Outliers exist.

Page : 2 of 4

Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554



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 <u>VOC in soils</u> 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: **x** = Holding time breach : ✓ = Within holding time.

Matrix. 301L					Lvaluation	I lolding time	breach, V = Willin	ir noluling till	
Method	Sample Date	E	ktraction / Preparation		Analysis				
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA037: Ass Field Screening Analysis	s								
Snap Lock Bag - frozen on receipt at A	ALS (EA037)								
BH42-0.1,	BH42-0.5,	24-May-2021	27-May-2021	20-Nov-2021	✓	27-May-2021	20-Nov-2021	✓	
BH42-1.0,	BH42-2.0,								
BH42-3.0,	BH36-0.1,								
BH36-0.5,	BH36-1.0,								
BH36-2.0,	BH36-3.0,								
BH44-0.1,	BH44-0.5,								
BH44-1.0,	BH44-2.0,								
BH44-3.0,	BH34-0.1,								
BH34-0.5,	BH34-1.0,								
BH34-2.0,	BH34-3.0,								
BH28-0.1,	BH28-0.5,								
BH28-1.0,	BH28-2.0,								
BH28-3.0									

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Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554



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.

Wattist COIL	Evaluation. Quality Control inequality for Wallin opcollocation, Quality Control inequality with							
Quality Control Sample Type			ount		Rate (%)		Quality Control Specification	
Analytical Methods Method		QC	Reaular	Actual Expected		Evaluation		
Laboratory Duplicates (DUP)								
ASS Field Screening Analysis	EA037	3	28	10.71	10.00	✓	NEPM 2013 B3 & ALS QC Standard	

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Work Order : EM2109607 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554



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
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Preparation Methods	Method	Matrix	Method Descriptions
Drying only	* EN020D	SOIL	In house



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : EM2110602

Amendment : 1

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact : MR SHANE GILIAM Contact : Graeme Jablonskas

Address : Level 15, 28 Freshwater Place Address : 4 Westall Rd Springvale VIC Australia

SOUTHBANK VIC, AUSTRALIA 3006 3

 Telephone
 : +61 03 9861 1111
 Telephone
 : +6138549 9609

 Facsimile
 : +61 03 9861 1144
 Facsimile
 : +61-3-8549 9626

 Order number
 : -- Quote number
 : EM2021PARBRIVIC0004 (ME/167/21)

 C-O-C number
 : -- QC Level
 : NEPM 2013 B3 & ALS QC Standard

Site : ----Sampler :

Dates

Date

Delivery Details

Mode of Delivery : Samples On Hand Security Seal : Not Available

No. of coolers/boxes : ---
Receipt Detail : Temperature : ---
No. of samples received / analysed : 68 / 68

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 direct any queries related to sample condition / numbering / breakages to Client Services.
- Sample Disposal Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Analytical work for this work order will be conducted at ALS Springvale and ALS Brisbane.
- 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 absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.
- This is a rebatch of EM2109285, EM2109498, EM2109392, and EM2109706.
- 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.

: 06-Jul-2021 Issue Date

Page

2 of 4 EM2110602 Amendment 1 Work Order Client : WSP Australia Pty Ltd



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 ä tasks, that are included in the package. Chromium Suite for Acid Sulphate Soils (pretest If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date Suite 1 is provided, the sampling date will be assumed by the merson Aggregate Test laboratory and displayed in brackets without a time Soil OIL - AG-1 EM Only component gricultural (CEC) Matrix: SOIL EA029 OIL - EA033 EA058 Laboratory sample Sampling date / Sample ID ID time EM2110602-001 19-May-2021 00:00 BH01-0.5 ✓ FM2110602-002 19-May-2021 00:00 BH01-1.0 / EM2110602-003 19-May-2021 00:00 BH01-2.0 ✓ EM2110602-004 19-May-2021 00:00 BH01-3.0 / EM2110602-005 19-May-2021 00:00 BH02-0.1 ✓ ✓ EM2110602-006 19-May-2021 00:00 BH02-0.5 ✓ ✓ EM2110602-007 19-May-2021 00:00 BH02-1.0 ✓ EM2110602-008 21-May-2021 00:00 BH03-0.1 ✓ BH08-1.0 EM2110602-009 19-May-2021 00:00 ✓ EM2110602-010 19-May-2021 00:00 BH08-2.0 ✓ EM2110602-011 21-May-2021 00:00 BH09-0.1 ✓ EM2110602-013 21-May-2021 00:00 BH09-1.0 EM2110602-014 21-May-2021 00:00 BH11-0.1 ✓ ✓ EM2110602-015 21-May-2021 00:00 BH11-0.5 ✓ EM2110602-016 21-May-2021 00:00 BH11-1.0 ✓ EM2110602-017 21-May-2021 00:00 BH11-2.0 ✓ EM2110602-018 21-May-2021 00:00 BH11-3.0 ✓ EM2110602-019 21-May-2021 00:00 BH17-0.5 ✓ EM2110602-020 21-May-2021 00:00 BH17-1.0 ✓ EM2110602-021 21-May-2021 00:00 BH17-2.0 ✓ EM2110602-022 21-May-2021 00:00 BH17-3.0 ✓ EM2110602-023 19-May-2021 00:00 BH19-0.1 ✓ EM2110602-024 19-May-2021 00:00 BH19-0.5 ✓ EM2110602-025 19-May-2021 00:00 BH19-1.0 ✓ EM2110602-026 19-May-2021 00:00 BH19-2.0 EM2110602-027 19-May-2021 00:00 BH21-0.5 ✓ EM2110602-028 19-May-2021 00:00 BH21-1.0 ✓ EM2110602-029 19-May-2021 00:00 BH21-2.0 EM2110602-030 21-May-2021 00:00 ✓ 1 BH22-0.5 BH22-1.0 EM2110602-031 21-May-2021 00:00 EM2110602-032 21-May-2021 00:00 BH22-2.0 ✓ EM2110602-033 19-May-2021 00:00 BH24-0.5 ✓ EM2110602-034 19-May-2021 00:00 BH24-1.0 EM2110602-035 19-May-2021 00:00 BH24-2.0 EM2110602-036 19-May-2021 00:00 BH25-0.1

Issue Date : 06-Jul-2021

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: 3 of 4 : EM2110602 Amendment 1 Work Order Client : WSP Australia Pty Ltd



			SOIL - AG-1 EM Only Agricultural (CEC) Soil Suite 1 (pretest air dried)	SOIL - EA029 SPOCAS	SOIL - EA033 Chromium Suite for Acid Sulphate Soils	SOIL - EA058 Emerson Aggregate Test
EM2110602-037	19-May-2021 00:00	BH25-0.5	✓			✓
EM2110602-038	19-May-2021 00:00	BH25-1.0	✓			✓
EM2110602-039	19-May-2021 00:00	BH25-2.0	✓			✓
EM2110602-040	20-May-2021 00:00	BH26-0.5	✓			✓
EM2110602-041	20-May-2021 00:00	BH26-1.0	✓			✓
EM2110602-042	20-May-2021 00:00	BH26-2.0	✓			✓
EM2110602-043	24-May-2021 00:00	BH28-0.1			✓	
EM2110602-044	24-May-2021 00:00	BH28-0.5	✓		✓	✓
EM2110602-045	24-May-2021 00:00	BH28-1.0	✓		✓	✓
EM2110602-046	24-May-2021 00:00	BH28-2.0	✓		✓	✓
EM2110602-047	24-May-2021 00:00	BH28-3.0			✓	
EM2110602-048	20-May-2021 00:00	BH32-0.1	✓			✓
EM2110602-049	20-May-2021 00:00	BH32-0.5	✓			✓
EM2110602-050	20-May-2021 00:00	BH32-1.0	✓			✓
EM2110602-051	20-May-2021 00:00	BH32-2.0	✓			✓
EM2110602-052	20-May-2021 00:00	BH33-0.1			✓	
EM2110602-053	20-May-2021 00:00	BH33-0.5	✓	✓	✓	✓
EM2110602-054	20-May-2021 00:00	BH33-1.0	✓		✓	✓
EM2110602-055	20-May-2021 00:00	BH33-2.0	✓		✓	✓
EM2110602-056	24-May-2021 00:00	BH36-0.5	✓			✓
EM2110602-057	24-May-2021 00:00	BH36-1.0	✓			✓
EM2110602-058	24-May-2021 00:00	BH36-2.0	✓			✓
EM2110602-059	24-May-2021 00:00	BH36-3.0	✓			✓
EM2110602-060	19-May-2021 00:00	BH41-0.5			✓	
EM2110602-061	19-May-2021 00:00	BH41-1.0			✓	
EM2110602-062	19-May-2021 00:00	BH41-3.0			✓	
EM2110602-063	24-May-2021 00:00	BH44-0.1			✓	
EM2110602-064	24-May-2021 00:00	BH44-1.0			✓	
EM2110602-065	24-May-2021 00:00	BH44-2.0			✓	
EM2110602-066	24-May-2021 00:00	BH44-3.0			✓	
EM2110602-067	20-May-2021 00:00	DUP05-210520	✓			✓
EM2110602-068	21-May-2021 00:00	DUP07-210521			✓	
EM2110602-069	21-May-2021 00:00	DUP09-210521	✓			✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

: 06-Jul-2021 Issue Date

Page

: 4 of 4 : EM2110602 Amendment 1 Work Order Client : WSP Australia Pty Ltd



Requested Deliverables

Accounts PayableAU		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
EVAN LISHMUND		
- *AU Certificate of Analysis - NATA (COA)	Email	evan.lishmund@wsp.com
 *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) 	Email	evan.lishmund@wsp.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	evan.lishmund@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	evan.lishmund@wsp.com
- Chain of Custody (CoC) (COC)	Email	evan.lishmund@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	evan.lishmund@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	evan.lishmund@wsp.com
SHANE GILIAM		
- *AU Certificate of Analysis - NATA (COA)	Email	shane.giliam@wsp.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	shane.giliam@wsp.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	shane.giliam@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	shane.giliam@wsp.com
- Chain of Custody (CoC) (COC)	Email	shane.giliam@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	shane.giliam@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	shane.giliam@wsp.com

Rebatch

Client / Client code: PARBRIVIC

Project: PS124554

Project Manger: SHANE GILIAM

Date /time sample rec: Various

Date/time Instructions rec: Wed 2/06/2021 2:36 PM

Due date: 5 day TAT

CS Contact: Additional Information:

	Sample information							Analysis Standard					sis Leach				
I∧⊦		•	1		$\overline{}$					1	<u>u</u>		1	Leacii	T	F	∯ p
New Lab ID	Client ID	Sampling Date / Time	Previous Work Order Reference	Previous ALS ID	Tray Number(s)	Container	Number of Containers	Emerson Class Dispersion Testing + Exchangeable Sodium Percentage	Chromium Suite	SPOCAS Suite							Shortest Holding time expiry
	BH01-0.5		EM2109285	2	MS2708-21	, Freezer C1		Х									
2	BH01-1.0	"	EM2109285	3	MS2708-21	, Freezer C1		Х								-	
3	BH01-2.0		EM2109285	4	MS2708-21	, Freezer C1		Х									
4	BH01-3.0		EM2109285	5	MS2708-21	, Freezer C1		Х					1	i		l	
5	BH02-0.1		EM2109285	11	MS2708-21	, Freezer C1		X					— Envi	ronmenta	al Divisio	n —	
6	BH02-0.5		EM2109285	12	MS2708-21	, Freezer C1		Х			1			ourne	D. 111010		
7	BH02-1.0		EM2109285	13	MS2708-21	Freezer C1		X.						ork Order F	Reference	_	
$\hat{\sigma}$	BH03-0.1		EM2109498	10					Χ.				_ F	ork Order F M21	1060	「2 ⁻	
4	BH08-1.0		EM2109285	33	MS2708-21	Freezer C1		X						.1712_1	1000		
10	BH08-2.0		EM2109285	34	MS2708-21			X					_				
11	BH09-0.1	1 11 11112	EM2109498	6	HS:1240			X					_			∥ −	
1	BH09-0.5		EM2109498	7	Free 1er			X					_				
13	BH09-1.0		EM2109498	8		را تا .		Х					_		7 17 7 18 1	-	
14	BH11-0.1		EM2109498	1			1.00		Х				_			-	
15	BH11-0.5		EM2109498	2				X	Х						1811 1818	"' =	
TG	BH11-1.0		EM2109498	3				Х	Х				— Telepho	ne: +61-3-85	49 9600		
17	BH11-2.0		EM2109498	4				Х	Х					1 .			
18	BH11-3.0		EM2109498	5				Х	Х						T		
19	BH17-0.5		EM2109498	17				Х									
20	BH17-1.0		EM2109498	18				X							1		
21	BH17-2.0		EM2109498	19				X									
11	BH17-3.0		EM2109498	20				X									
20	BH19-0.1		EM2109285	31	MS2708-21	, Freezer C1		X			1						
24	BH19-0.5		EM2109285	32		Freezer C1		X			1				1		
72	BH19-1.0		EM2109285	33	MS2708-21			X									
26	BH19-2.0		EM2109285	34	MS2708-21			X			<u> </u>						
17	BH21-0.5		EM2109285	44		, Freezer C1		X									
28	BH21-1.0		EM2109285	45		, Freezer C1		X									
79	BH21-2.0		EM2109285	46		, Freezer C1		X						- "	T		
	(47/3) BH22-0.5		EM2109498	23			Page 1 of								1	A	pproved Date: 01/02/20
31	BH22-1.0		EM2109498	24				X									

Client / Client code: PARBRIVIC

Project: PS124554
Project Manger: SHANE GILIAM
Date /time sample rec: Various

Date/time Instructions rec: Wed 2/06/2021 2:36 PM

Due date: 5 day TAT

CS Contact: Additional Information:

	······································	Sample information	n									Anal	/sis				
ا∟ا	<u> </u>									Standard)		. 1	Lea	ach _	T	වූ
New Lab ID		a e	g der	_	nber(s)	_	of ers	iss esting + le Sodium	E	Suite							Holdir
New	Client ID	Sampling Date / Time	Work Orde Reference	Previous ALS ID	Tray Number(s)	Container	Number of Containers	Emerson Class Dispersion Testing + Exchangeable Sodium Percentage	Chromium Suite	SPOCAS							Shortest Holding time expiry
32	BH22-2,0	EM2	109498	25				Х									
27	BH24-0.5	EM2	109285	50	MS2708-21	, Freezer C1		Х									
74	BH24-1.0			51	MS2708-21	, Freezer C1		Х									
35	BH24-2.0		109285	52	MS2708-21	, Freezer C1		X									
36	BH25-0.1			62		, Freezer C1		Х									
37	BH25-0.5			63	MS2708-21	, Freezer C1		X									
38	BH25-1.0			64		, Freezer C1		X									
3 4	BH25-2.0			65		, Freezer C1		Х									
40	BH26-0.5		109392		HS1229-33			Х									
41	BH26-1.0		109392		HS1229-33			Х									
47	BH26-2.0		109392	16		Freezer B1		X							-		
42	BH28-0.1		109607	34		HS1259, Fre	ezer C1		X								
44	BH28-0.5					HS1259, Fre		Х	X								
45	BH28-1.0					HS1259, Fre		Х	X								
46	BH28-2.0					HS1259, Fre		X	X	· · · · · ·							
47	BH28-3.0				MS2780-2,	HS1259, Fre	ezer C1		X								
48	BH32-0.1				HS1229-33			Х									
wal	BH32-0.5				HS1229-33			Х				-					
3	BH32-1.0				HS1229-33			Х				<u>-</u>					
2.1	BH32-2.0		109392		HS1229-33	, Freezer B1		Х									
25	BH33-0.1			26	HS1229-33	Freezer B1			Х								
17	BH33-0.5			27	HS1229-33	, Freezer B1		Х	Х	Х							
54	BH33-1.0			28	HS1229-33	, Freezer B1		X	X	-	-						
175	BH33-2.0				HS1229-33			X	X								
<i>1</i> 2	BH36-0.5		109607	7		HS1259, Fre	ezer C1	X							-		
57	BH36-1.0		109607			HS1259, Fre		X									
55	BH36-2.0		109607			HS1259, Fre		X									1
58 59	BH36-3.0		109607			HS1259, Fre		X									
60	BH41-0.5		109285	7		, Freezer C1			X								
VEFM	(47/3) BH41-1.0		109285			, Freezer C1	Page 2 of	3	X							A	pproved Date: 01/02
VU	BH41-3.0		109285			, Freezer C1			X		1					1	

Client / Client code: PARBRIVIC

Project: PS124554

Project Manger: SHANE GILIAM

Date /time sample rec: Various

Date/time Instructions rec: Wed 2/06/2021 2:36 PM

Due date: 5 day TAT

CS Contact:
Additional Information:

		Canania infa										Anal	ysis			
		Sample info	rmation							Standard	<u> </u>			 <u>Leach</u>		D
New Lab ID	Client ID	Sampling Date / Time	Previous Work Order Reference	Previous ALS ID	Tray Number(s)	Container	Number of Containers	Emerson Class Dispersion Testing + Exchangeable Sodium Percentage	Chromium Suite	SPOCAS Suite						Shortest Holdin time expiry
13	BH44-0.1		EM2109607		MS2780-2,	HS1259, Fre	ezer C1		X							
64	BH44-1.0		EM2109607			HS1259, Fre			X							
1.5	BH44-2.0		EM2109607			HS1259, Fre			Χ					 	 	
28	BH44-3.0		EM2109607	19	MS2780-2,	HS1259, Fre	ezer C1		Х						_	
67	DUP05-210520		EM2109392	41	HS1229-33	, Freezer B1		X								
18	DUP07-210521		EM2109498	15					Х							
69	DUP09-210521		EM2109498	21				X						 		
					1	TOTAL	0			<u> </u>				 	 	

[EXTERNAL] - Officer South

Lishmund, Evan < Evan.Lishmund@wsp.com>

Wed 6/2/2021 2:36 PM

To: Graeme Jablonskas <Graeme.Jablonskas@alsglobal.com> **Cc:** Giliam, Shane <Shane.Giliam@wsp.com>

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Graeme,

Can I please request the below analysis on standard TAT:

	Laboratory Sample	Emerson Class Dispersion Testing + Exchangeable	Chromium Reducible	SPOCAS
Sample ID	ID	Sodium Percentage	Sulfur Suite	Suite
BH01-0.5	EM2109285-002	×		
BH01-1.0	EM2109285-003	X		
вн01-2.0	EM2109285-004	X		
BH01-3.0	EM2109285-005	X		
вн02-0.1	EM2109285-011	X		
вно2-0.5	EM2109285-012	X		
BH02-1.0	EM2109285-013	X	5	
вн03-0.1	EM2109498010		X	
BH08-1.0	EM2109285-033	×		
вн08-2.0	EM2109285-034	×		
BH09-0.1	EM2109498-006	×		
вн09-0.5	EM2109498-007	×		
вн09-1.0	EM2109498-008	×		
BH11-0.1	EM2109498001		×	
BH11-0.5	EM2109498-002	×	×	-
BH11-1.0	EM2109498-003	×	×	
BH11-2.0	EM2109498-004	×	X	
BH11-3.0	EM2109498-005	×	×	
вн17-0.5	EM2109498-017	×		
BH17-1.0	-EM2109498-018	×		
BH17-2.0	EM2109498-019	×		
BH17-3.0	EM2109498-020	×		
BH19-0.1	EM2109285-031	×		
вн19-0.5	EM2109285-032	×		
BH19-1.0	EM2109285-033	×		
вн19-2.0	EM2109285-034	×		
BH21-0.5	EM2109285-044	×		
BH21-1.0	EM2109285-045	×		
BH21-2.0	EM2109285-046	×		
вн22-0.5	EM2109498-023	×		
вн22-1.0	EM2109498-024	×		
вн22-2.0	EM2109498-025	×		
BH24-0.5	EM2109285-050	×		
BH24-1.0	EM2109285-051	×		
BH24-2.0	EM2109285-052	×		
BH25-0.1	EM2109285-062	×		
вн25-0.5	EM2109285-063	×		

		>	EIVIZ109498-021	T750T7-60400
	×		EM2109498015	DUP07-210521
		×	EM2109392-041	DUP05-210520
	×		EM2109607019	BH44-3.0
	×		EM2109607018	BH44-2.0
	×		EM2109607017	BH44-1.0
	×		EM2109607015	BH44-0.1
	×		EM2109285010	BH41-3.0
	×		EM2109285008	BH41-1.0
	×		EM2109285007	BH41-0.5
		×	EM2109607-010	вн36-3.0
		×	EM2109607-009	ВН36-2.0
		×	EM2109607-008	вн36-1.0
		×	EM2109607-007	вн36-0.5
	×	×	EM2109392-028	вн33-2.0
	×	×	EM2109392-028	вн33-1.0
×	×	×	EM2109392-027	вн33-0.5
	×		EM2109392026	BH33-0.1
		×	EM2109392-024	ВН32-2.0
		×	EM2109392-023	вн32-1.0
		×	EM2109392-022	вн32-0.5
		×	EM2109392-021	вн32-0.1
	×		EM2109607038	вн28-3.0
	×	×	EM2109607-037	вн28-2.0
	×	×	EM2109607-036	BH28-1.0
	×	×	EM2109607-035	вн28-0.5
	×		EM2109607034	BH28-0.1
		×	EM2109392-016	ВН26-2.0
		×	EM2109392-015	BH26-1.0
		×	EM2109392-014	вн26-0.5
		×	EM2109285-065	вн25-2.0
		×	EM2109285-064	BH25-1.0

Let me know if there are any issues.

Cheers,



Evan LishmundEnvironmental Scientist

T: +61 3 8327 8691

Evan.Lishmund@wsp.com

WSP Australia Pty Limited Level 15, 28 Freshwater Place Southbank, VIC 3006 Australia

wsp.com/au

CS Contact: Additional Information:

Client / Client code: PARBRIVIC

Project: PS124554
Project Manger: SHANE GILIAM
Date /time sample rec: Various
Date/time Instructions rec: Wed 2/06/2021 2:36 PM
Due date: 5 day TAT

																-								-							910	
	Shortest Holding time expiry																														Approved Date: 01/02/2016	
	בפמנו					Environmental Division	Melbourne	Work Order Reference	EM2110602	1000						Telephone - + R1-8-9840 0800															<	
Analysis																																
7,000	1																															
	Percentage Chromium Suite								×						×	×	×	×	×													
	Emerson Class Dispersion Testing + Exchangeable Sodium		×	×	×	×	×	X		×	×	×	×	×		×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
	Number of Containers																								-						Page 1 of	
	Container	Freezer C1	Freezer C1	Freezer C1	Freezer C1	Freezer C1	Freezer C1	, Freezer C1		Freezer C1	Freezer C1	-124L	7.8											Freezer C1	Freezer C1	Freezer C1	Freezer C1	Freezer C1	Freezer C1	Freezer C1		
	Tray Number(s)	MS2708-21,	MS2708-21, Freeze	MS2708-21, Freezer C1	MS2708-21, Freezer C1	MS2708-21, Freezer C'	MS2708-21,	MS2708-21,		MS2708-21, Freezer C1	MS2708-21, Freez	1721-10721:SH	Freezer											MS2708-21,	MS2708-21, Freezer C1	MS2708-21, Freezer C1	MS2708-21, Freezer C1	MS2708-21, Freezer C1	MS2708-21, Freezer C1	MS2708-21, Freezer C1		
	Previous ALS ID	2		4	2	11	12	13	10	33	34	9	7	8	7		က			17	18	19	20		32	33	8	44	45	46	23	24
mation	Previous Work Order Reference	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109498	EM2109285	EM2109285	EM2109498	EM2109498	EM2109498	EM2109498	EM2109498	EM2109498	EM2109498	EM2109498	EM2109498	EM2109498	EM2109498	EM2109498	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109498	EM2109498
Sample information	Sampling Date / Time							-																								
	Client ID	BH01-0.5	BH01-1.0	BH01-2.0	BH01-3.0	BH02-0.1	BH02-0.5	BH02-1.0	BH03-0.1	BH08-1.0	BH08-2.0	BH09-0.1	BH09-0.5	BH09-1.0	BH11-0.1	BH11-0.5	BH11-1.0	BH11-2.0	BH11-3.0	BH17-0.5	BH17-1.0	BH17-2.0	BH17-3.0	BH19-0.1	BH19-0.5	BH19-1.0	BH19-2.0	BH21-0.5	BH21-1.0	BH21-2.0	BH22-0.5	BH22-1.0
	al and here				+						-					,									٠	. 4	و			5	(4773) C	
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CS Contact: Additional Information:

Client / Client code: PARBRIVIC
Project: PS124554
Project Manger: SHANE GILIAM
Date /time sample rec: Various
Date/time Instructions rec: Wed 2/06/2021 2:36 PM
Due date: 5 day TAT

	Shortest Holding time expiry										:											-									Approved Date: 01/02/2016	
																															Approve	
4000	1									:																						
Analysis																																
Ctondord	SPOCAS Suite																						×									
	muimondO Suite												×	×	×	×	×					×	×	X	×					×	×	×
	Emerson Class Dispersion Testing + Exchangeable Sodium Percentage		×	×	×	×	×	×	×	X	×	×		×	×	×		X	×	×	×		X	X	X	×	×	X	X		€	
	Number of Containers												reezer C1	reezer C1	reezer C1	reezer C1	ezer C1									ezer C1	ezer C1	ezer C1	ezer C1		Page 2 of	
	Container		\sim	, Freezer C1	, Freezer C1	, Freezer C1	, Freezer C1	, Freezer C1	, Freezer C1	HS1229-33, Freezer B1	HS1229-33, Freezer B1	Freezer B1			ഥ	HS1259, Fre	MS2780-2, HS1259, Freezer C1	HS1229-33, Freezer B1	HS1229-33, Freezer B1	HS1229-33, Freezer B1	HS1229-33, Freezer B1	Freezer B1	HS1229-33, Freezer B1	HS1229-33, Freezer B1	HS1229-33, Freezer B1	MS2780-2, HS1259, Freezer C1	MS2780-2, HS1259, Freezer C1	MS2780-2, HS1259, Freezer C1	MS2780-2, HS1259, Freezer C1	MS2708-21, Freezer C1	MS2708-21, Freezer C1	MS2708-21, Freezer C1
	Tray Number(s)		MS2708-21, Freezer	MS2708-21, Freezer	MS2708-21	MS2708-21, Freezer C1	MS2708-21	MS2708-21	MS2708-21	HS1229-33	HS1229-33	HS1229-33, Freezer B	MS2780-2, HS1259, F	MS2780-2, HS1259, F	MS2780-2, HS1259,	MS2780-2, HS1259, F	MS2780-2,	HS1229-33	HS1229-33	HS1229-33	HS1229-33	HS1229-33,	HS1229-33,	HS1229-33,	HS1229-33,	MS2780-2,	MS2780-2,	MS2780-2,	MS2780-2,	MS2708-21	MS2708-21	MS2708-21
	Previous ALS ID	CA	5 50	51	52	62	63	64	92	14	2 15	2 16	7 34			_	7 38	_	_		_			2 28		7 7	8 /	6 /	10	5 7	2	5 10
mation	Previous Work Order Reference	EM2109498	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109285	EM2109392	EM2109392	EM2109392	EM2109607	EM2109607	EM2109607	EM2109607	EM2109607	EM2109392	EM2109392	EM2109392	EM2109392	EM2109392	EM2109392	EM2109392	EM2109392	EM2109607	EM2109607	EM2109607	EM2109607	EM2109285	EM2109285	EM2109285
Sample information	Sampling Oate / Time												-																			
	Client ID	BH22-2.0	BH24-0.5	BH24-1.0	BH24-2.0	BH25-0.1	BH25-0.5	BH25-1.0	BH25-2.0	BH26-0.5	BH26-1.0	BH26-2.0	BH28-0.1	BH28-0.5	BH28-1.0	BH28-2.0	BH28-3.0	BH32-0.1	BH32-0.5	BH32-1.0	BH32-2.0	BH33-0.1	BH33-0.5	BH33-1.0	BH33-2.0	BH36-0.5	BH36-1.0	BH36-2.0	BH36-3.0	BH41-0.5	BH41-1.0	BH41-3.0
	New Lab ID	32	2	き	∴	ગુદ	21	78.	द्र	ဍ	<u>-</u>	14.	€	<u>‡</u>	7	ીત	17	₹ *E	Z	3	L	135	C	古	と	2	2.1	J's	320	2	WEEN (47/3)	6.L

CS Contact: Additional Information:

Client / Client code: PARBRIVIC
Project: PS124554
Project Manger: SHANE GILIAM
Date /time sample rec: Various
Date/time Instructions rec: Wed 2/06/2021 2:36 PM
Due date: 5 day TAT

	f	Shortest Holding time expiry								
	Leach									
Analysis		·								
Ana										
	Standard	SPOCAS Suite								
		Chromium Suite	X	X	×	X		X		
		Emerson Class Dispersion Testing + Exchangeable Sodium Percentage					X		X	
		Number of Containers	zer C1	szer C1	zer C1	zer C1				0
		Container	HS1259, Freezer C1	HS1259, Freezer C1	MS2780-2, HS1259, Freezer C1	HS1259, Freezer C1	Freezer B1			
		Tray Number(s)	MS2780-2, I	MS2780-2, H	MS2780-2,	MS2780-2, H	HS1229-33,			
		Previous ALS ID	7	17	18	19	41	15	21	
motion	III ation	Previous Work Order Reference	EM2109607	EM2109607	EM2109607	EM2109607	EM2109392	EM2109498	EM2109498	
Comple information	dample mor	Sampling Date / Time								
		Client ID	BH44-0.1	BH44-1.0	BH44-2.0	BH44-3.0	DUP05-210520	DUP07-210521	DUP09-210521	

New Lab ID

[EXTERNAL] - Officer South

Lishmund, Evan < Evan.Lishmund@wsp.com>

Wed 6/2/2021 2:36 PM

To: Graeme Jablonskas < Graeme. Jablonskas@alsglobal.com>

Cc: Giliam, Shane <Shane.Giliam@wsp.com>

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Graeme,

Can I please request the below analysis on standard TAT:

	Laboratory Commis	Emerson Class Dispersion	Chromium Reducible	SPOCAS
Sample ID	Laboratory Sample	Testing + Exchangeable Sodium Percentage	Sulfur Suite	Suite
BH01-0.5	EM2109285-002	X	Sullui Suite	Juite
BH01-0.3	EM2109285-003	X		
BH01-2.0	EM2109285-004	X		
BH01-3.0	EM2109285-005	X		
ВН01-3.0	EM2109285-003	X		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
BH02-0.5	EM2109285-011	X		
BH02-0.3	EM2109285-012	X		
ВН02-1.0	EM2109498010	^	X	<u>'</u>
ВН03-0.1		V	^	
ВН08-1.0	EM2109285-033 EM2109285-034	X	············	
BH08-2.0 BH09-0.1		 		
BH09-0.1	EM2109498-006 EM2109498-007	X X		
ВН09-0.5		 	·	ļ
ВН09-1.0	EM2109498-008 EM2109498001	X	V .	-
		V	X	
BH11-0.5 BH11-1.0	EM2109498-002	X	X	
	EM2109498-003	X	X .	
BH11-2.0	EM2109498-004	X	X	
BH11-3.0	EM2109498-005	X	X	
BH17-0.5	EM2109498-017	X		
BH17-1.0	EM2109498-018	X		
BH17-2.0	EM2109498-019	X		
BH17-3.0	EM2109498-020	X		
BH19-0.1	EM2109285-031	X		
BH19-0.5	EM2109285-032	X		
BH19-1.0	EM2109285-033	Х		
BH19-2.0	EM2109285-034	X		
BH21-0.5	EM2109285-044	X		
BH21-1.0	EM2109285-045	Х		
BH21-2.0	EM2109285-046	X		<u></u>
BH22-0.5	EM2109498-023	X		1
BH22-1.0	EM2109498-024	Х		
BH22-2.0	EM2109498-025	X		
BH24-0.5	EM2109285-050	X.		
BH24-1.0	EM2109285-051	Х		
BH24-2.0	EM2109285-052	X		
BH25-0.1	EM2109285-062	Х		
BH25-0.5	EM2109285-063	X		

BH25-1.0	EM2109285-064	x		
BH25-2.0	EM2109285-065	X		
BH26-0.5	EM2109392-014	X		
BH26-1.0	EM2109392-015	X		
BH26-2.0	EM2109392-016	X		-
BH28-0.1	EM2109607034		Х	
BH28-0.5	EM2109607-035	X	Х	
BH28-1.0	EM2109607-036	X	Х	
BH28-2.0	EM2109607-037	Х	Х	
BH28-3.0	EM2109607038		Х	
BH32-0.1	EM2109392-021	X		
BH32-0.5	EM2109392-022	X		
BH32-1.0	EM2109392-023	X		
BH32-2.0	EM2109392-024	X		
BH33-0.1	EM2109392026		X	
BH33-0.5	EM2109392-027	X	Х	Х
BH33-1.0	EM2109392-028	X	Х	
BH33-2.0	EM2109392-028	Х	Х	
BH36-0.5	EM2109607-007	X		
BH36-1.0	EM2109607-008	X		
BH36-2.0	EM2109607-009	. X		
BH36-3.0	EM2109607-010	X		
BH41-0.5	EM2109285007		X	
BH41-1.0	EM2109285008		Х	
BH41-3.0	EM2109285010		X	
BH44-0.1	EM2109607015		Х	
BH44-1.0	EM2109607017		Х	
BH44-2.0	EM2109607018		Х	
BH44-3.0	EM2109607019		X	
DUP05-210520	EM2109392-041	Х		
DUP07-210521	EM2109498015		X	

Let me know if there are any issues.

Cheers,



Evan Lishmund

Environmental Scientist

T: +61 3 8327 8691

Evan.Lishmund@wsp.com

WSP Australia Pty Limited Level 15, 28 Freshwater Place Southbank, VIC 3006 Australia

wsp.com/au



CERTIFICATE OF ANALYSIS

Work Order : **EM2110602** Page : 1 of 22

Amendment : 1

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

Contact : MR SHANE GILIAM Contact : Graeme Jablonskas

Address : Level 15, 28 Freshwater Place Address : 4 Westall Rd Springvale VIC Australia 3171

SOUTHBANK VIC, AUSTRALIA 3006

Telephone : +61 03 9861 1111 Telephone : +6138549 9609

 Order number
 : -- Date Analysis Commenced
 : 05-Jun-2021

 C-O-C number
 : -- Issue Date
 : 07-Jul-2021 10:18

Sampler : ---Site : ----

Quote number : ME/167/21

No. of samples received : 68

No. of samples analysed : 68

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 FelgendrejerisSenior Acid Sulfate Soil ChemistBrisbane Acid Sulphate Soils, Stafford, QLDDilani FernandoSenior Inorganic ChemistMelbourne Inorganics, Springvale, VICKim McCabeSenior Inorganic ChemistBrisbane Acid Sulphate Soils, Stafford, QLD

Page : 2 of 22

Work Order : EM2110602 Amendment 1
Client : WSP Australia Ptv Ltd

Project : PS124554



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.
- ED006: Potassium for sample EM2110602 #3, 4, 18, 26, 42 and 50 have been detected at less than LOR therefore the Magnesium/ Potassium ratio calculation cannot be performed.
- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- ASS: EA029 (SPOCAS): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA033 (CRS Suite): Retained Acidity not required because pH KCl greater than or equal to 4.5
- ASS: EA033 (CRS Suite): ANC not required because pH KCl less than 6.5
- ASS: EA029 (SPOCAS): Excess ANC not required because pH OX less than 6.5.
- Amendment (6/07/21): This report has been amended to change incorrect holding time breaches displayed in the QCI report for pH and EC.
- This is a rebatch of EM2109285, EM2109498, EM2109392, and EM2109706.
- ASS: EA033 (CRS Suite): 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'.
- ASS: EA029 (SPOCAS): 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.
- EA058 Emerson: V. = Very, D. = Dark, L. = Light, VD. = Very Dark
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCI Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).

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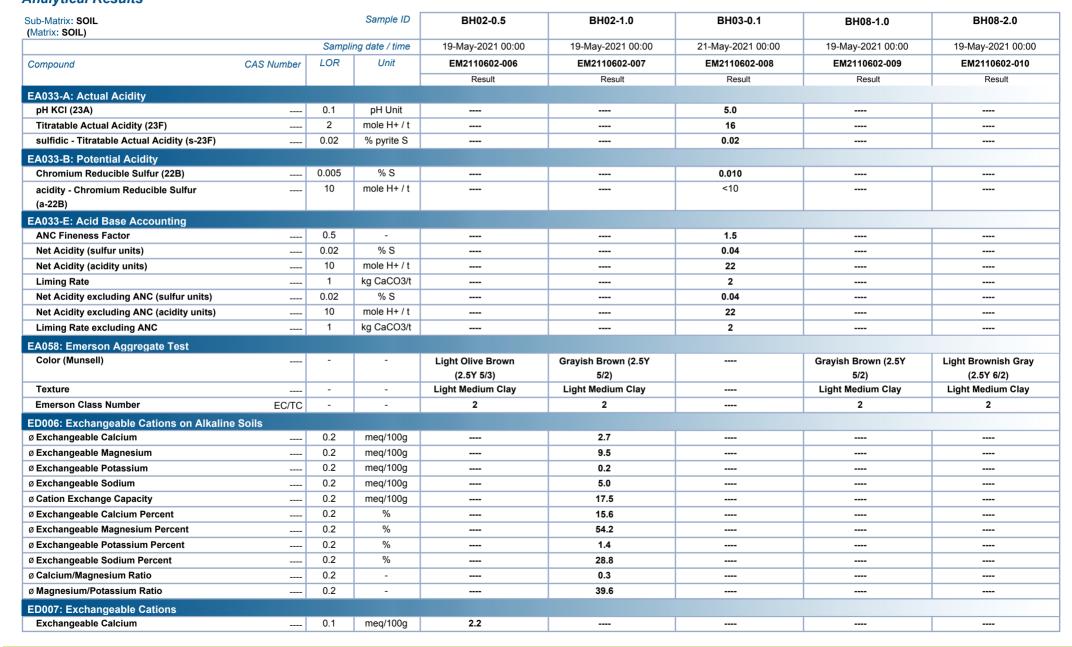




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Project : PS124554

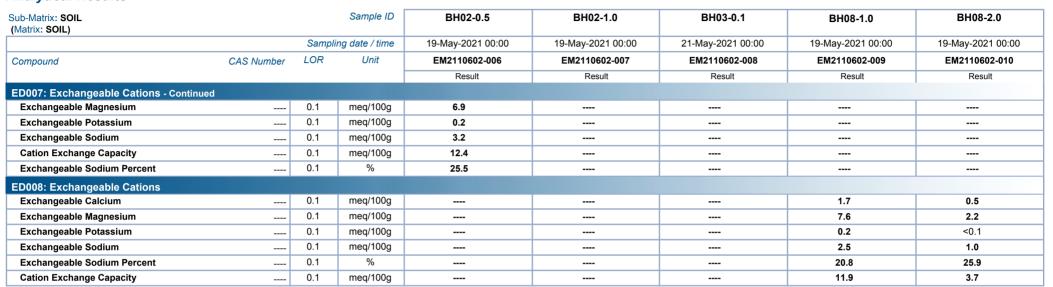




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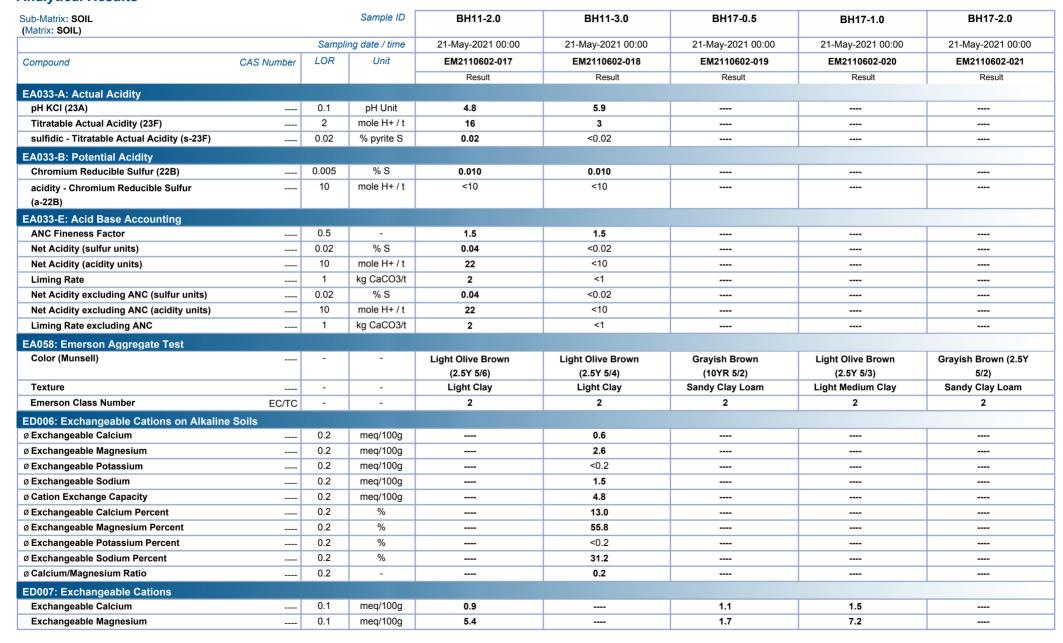




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Project : PS124554

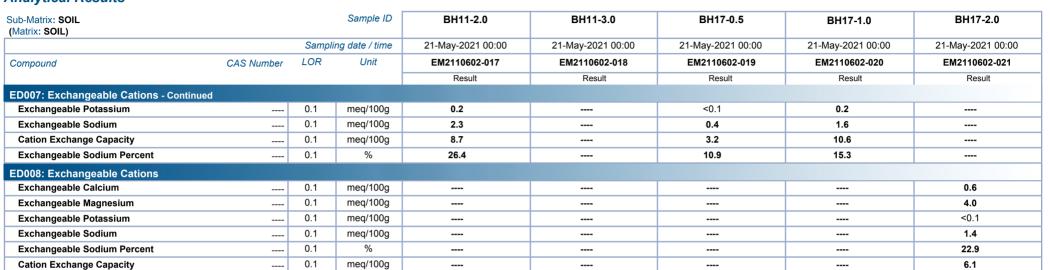




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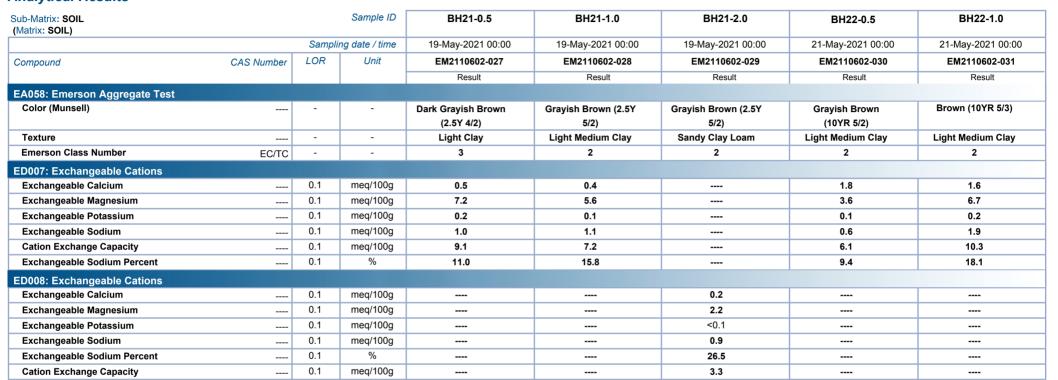




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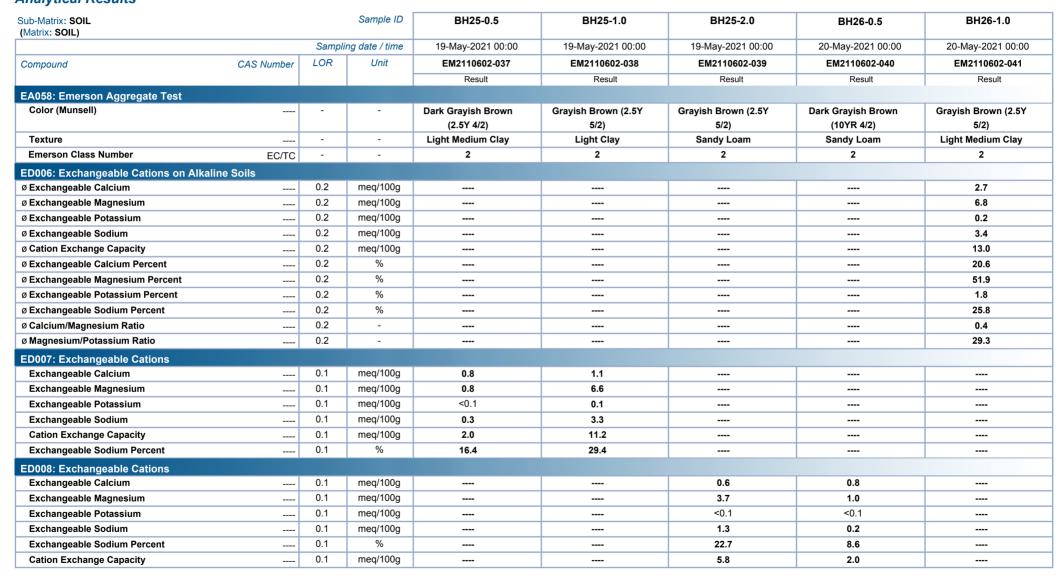
Project

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH22-2.0	BH24-0.5	BH24-1.0	BH24-2.0	BH25-0.1
		Sampli	ng date / time	21-May-2021 00:00	19-May-2021 00:00	19-May-2021 00:00	19-May-2021 00:00	19-May-2021 00:00
Compound	CAS Number	LOR	Unit	EM2110602-032	EM2110602-033	EM2110602-034	EM2110602-035	EM2110602-036
				Result	Result	Result	Result	Result
EA058: Emerson Aggregate Test								
Color (Munsell)		-	-	Grayish Brown (2.5Y 5/2)	Grayish Brown (10YR 5/2)	Dark Grayish Brown (2.5Y 4/2)	Gray (2.5Y 6/1)	Very Dark Brown (10YR 2/2)
Texture		-	-	Light Medium Clay	Sandy Clay Loam	Medium Clay	Light Medium Clay	Silty Loam
Emerson Class Number	EC/TC	-	-	2	2	2	3	2
ED007: Exchangeable Cations								
Exchangeable Calcium		0.1	meq/100g		2.0	1.6	0.9	4.8
Exchangeable Magnesium		0.1	meq/100g		7.1	10.3	7.3	1.7
Exchangeable Potassium		0.1	meq/100g		0.4	0.2	0.2	0.4
Exchangeable Sodium		0.1	meq/100g		1.6	2.9	3.5	0.3
Cation Exchange Capacity		0.1	meq/100g		11.1	15.0	11.8	7.2
Exchangeable Sodium Percent		0.1	%		14.1	19.4	29.5	3.7
ED008: Exchangeable Cations								
Exchangeable Calcium		0.1	meq/100g	1.2				
Exchangeable Magnesium		0.1	meq/100g	5.9				
Exchangeable Potassium		0.1	meq/100g	0.1				
Exchangeable Sodium		0.1	meq/100g	1.3				
Exchangeable Sodium Percent		0.1	%	15.3				
Cation Exchange Capacity		0.1	meq/100g	8.5				

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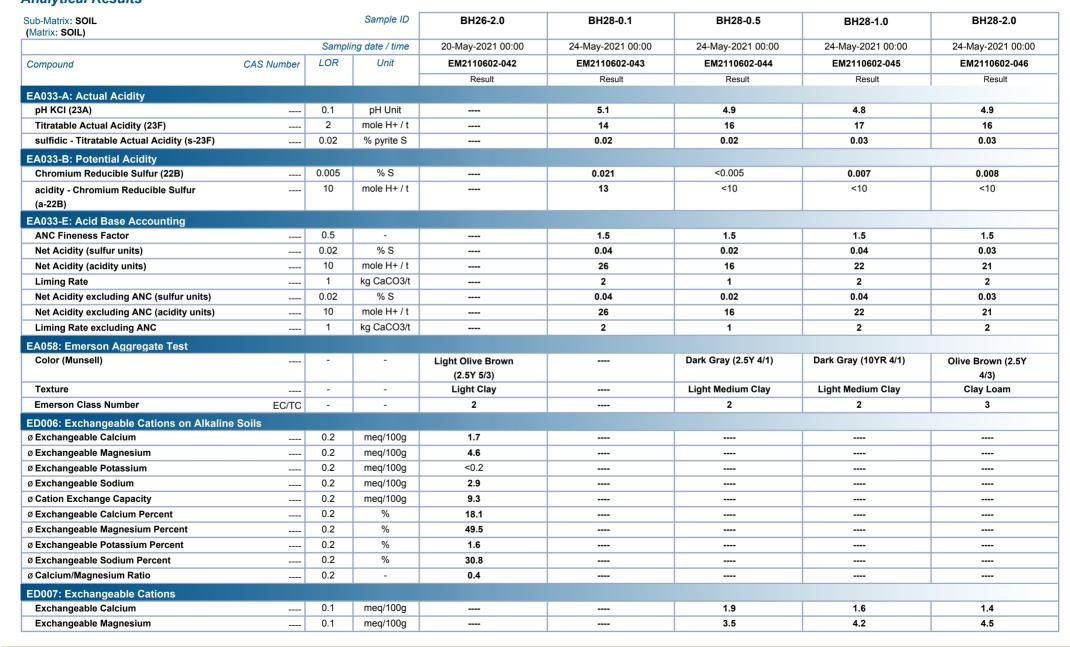




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Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH28-3.0	BH32-0.1	BH32-0.5	BH32-1.0	BH32-2.0
		Sampl	ing date / time	24-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00
Compound	CAS Number	LOR	Unit	EM2110602-047	EM2110602-048	EM2110602-049	EM2110602-050	EM2110602-051
'				Result	Result	Result	Result	Result
EA033-A: Actual Acidity								
pH KCI (23A)		0.1	pH Unit	4.7				
Titratable Actual Acidity (23F)		2	mole H+ / t	22				
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	0.03				
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)		0.005	% S	0.008				
acidity - Chromium Reducible Sulfur		10	mole H+ / t	<10				
(a-22B)								
EA033-E: Acid Base Accounting								
ANC Fineness Factor		0.5	-	1.5				
Net Acidity (sulfur units)		0.02	% S	0.04				
Net Acidity (acidity units)		10	mole H+/t	27				
Liming Rate		1	kg CaCO3/t	2				
Net Acidity excluding ANC (sulfur units)		0.02	% S	0.04				
Net Acidity excluding ANC (acidity units)		10	mole H+ / t	27				
Liming Rate excluding ANC		1	kg CaCO3/t	2				
EA058: Emerson Aggregate Test								
Color (Munsell)		-	-		Very Dark Gray (2.5Y 3/1)	Dark Grayish Brown (2.5Y 4/2)	Olive Brown (2.5Y 4/3)	Grayish Brown (2.5Y 5/2)
Texture		-	-		Sandy Loam	Sandy Loam	Clay Loam	Light Clay
Emerson Class Number	EC/TC	-	-		2	2	2	2
ED006: Exchangeable Cations on Alkalin	e Soils							
ø Exchangeable Calcium		0.2	meq/100g				1.5	1.5
ø Exchangeable Magnesium		0.2	meq/100g				6.1	7.6
ø Exchangeable Potassium		0.2	meq/100g				<0.2	0.3
ø Exchangeable Sodium		0.2	meq/100g				3.3	4.7
ø Cation Exchange Capacity		0.2	meq/100g				11.1	14.0
ø Exchangeable Calcium Percent		0.2	%				13.3	10.6
ø Exchangeable Magnesium Percent		0.2	%				55.0	54.2
ø Exchangeable Potassium Percent		0.2	%				1.7	1.9
ø Exchangeable Sodium Percent		0.2	%				30.0	33.3
ø Calcium/Magnesium Ratio		0.2	-				0.2	<0.2
ø Magnesium/Potassium Ratio		0.2	-					28.1
ED007: Exchangeable Cations								
Exchangeable Calcium		0.1	meq/100g		1.4	0.8		

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Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH33-0.1	BH33-0.5	BH33-1.0	BH33-2.0	BH36-0.5
(manua con)		Sampli	ing date / time	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	24-May-2021 00:00
Compound	CAS Number	LOR	Unit	EM2110602-052	EM2110602-053	EM2110602-054	EM2110602-055	EM2110602-056
Compound	O/10 Number			Result	Result	Result	Result	Result
EA029-A: pH Measurements				T GOOD!	- Noodil	T T T T T T T T T T T T T T T T T T T	T GOOD!	1 toodit
pH KCI (23A)		0.1	pH Unit		5.4			
pH OX (23B)		0.1	pH Unit		5.1			
EA029-B: Acidity Trail								
Titratable Actual Acidity (23F)		2	mole H+ / t		5			
Titratable Peroxide Acidity (23G)		2	mole H+ / t		6			
Titratable Sulfidic Acidity (23H)		2	mole H+ / t		<2			
sulfidic - Titratable Actual Acidity (s-23F)		0.020	% pyrite S		<0.020			
sulfidic - Titratable Peroxide Acidity		0.020	% pyrite S		<0.020			
(s-23G)								
sulfidic - Titratable Sulfidic Acidity (s-23H)		0.020	% pyrite S		<0.020			
EA029-C: Sulfur Trail								
KCI Extractable Sulfur (23Ce)		0.020	% S		<0.020			
Peroxide Sulfur (23De)		0.020	% S		<0.020			
Peroxide Oxidisable Sulfur (23E)		0.020	% S		<0.020			
acidity - Peroxide Oxidisable Sulfur (a-23E)		10	mole H+ / t		<10			
EA029-D: Calcium Values								
KCI Extractable Calcium (23Vh)		0.020	% Ca		0.024			
Peroxide Calcium (23Wh)		0.020	% Ca		0.024			
Acid Reacted Calcium (23X)		0.020	% Ca		<0.020			
acidity - Acid Reacted Calcium (a-23X)		10	mole H+ / t		<10			
sulfidic - Acid Reacted Calcium (s-23X)		0.020	% S		<0.020			
EA029-E: Magnesium Values								
KCI Extractable Magnesium (23Sm)		0.020	% Mg		<0.020			
Peroxide Magnesium (23Tm)		0.020	% Mg		<0.020			
Acid Reacted Magnesium (23U)		0.020	% Mg		<0.020			
Acidity - Acid Reacted Magnesium (a-23U)		10	mole H+ / t		<10			
sulfidic - Acid Reacted Magnesium		0.020	% S		<0.020			
(s-23U)								
EA029-H: Acid Base Accounting								
ANC Fineness Factor		0.5	-		1.5			
Net Acidity (sulfur units)		0.02	% S		<0.02			
Net Acidity (acidity units)		10	mole H+ / t		<10			
Liming Rate		1	kg CaCO3/t		<1			

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Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH33-0.1	BH33-0.5	BH33-1.0	BH33-2.0	BH36-0.5
		Sampli	ng date / time	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	20-May-2021 00:00	24-May-2021 00:00
Compound	CAS Number	LOR	Unit	EM2110602-052	EM2110602-053	EM2110602-054	EM2110602-055	EM2110602-056
				Result	Result	Result	Result	Result
EA029-H: Acid Base Accounting - Continu	ied							
Net Acidity excluding ANC (sulfur units)		0.02	% S		<0.02			
Net Acidity excluding ANC (acidity units)		10	mole H+ / t		<10			
Liming Rate excluding ANC		1	kg CaCO3/t		<1			
EA033-A: Actual Acidity								
pH KCI (23A)		0.1	pH Unit	5.7	5.4	5.6	5.0	
Titratable Actual Acidity (23F)		2	mole H+ / t	5	5	5	12	
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.02	<0.02	<0.02	<0.02	
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)		0.005	% S	0.008	0.014	0.009	0.014	
acidity - Chromium Reducible Sulfur		10	mole H+ / t	<10	<10	<10	<10	
(a-22B)								
EA033-E: Acid Base Accounting								
ANC Fineness Factor		0.5	-	1.5	1.5	1.5	1.5	
Net Acidity (sulfur units)		0.02	% S	<0.02	0.02	<0.02	0.03	
Net Acidity (acidity units)		10	mole H+ / t	10	14	11	20	
Liming Rate		1	kg CaCO3/t	<1	1	<1	1	
Net Acidity excluding ANC (sulfur units)		0.02	% S	<0.02	0.02	<0.02	0.03	
Net Acidity excluding ANC (acidity units)		10	mole H+ / t	10	14	11	20	
Liming Rate excluding ANC		1	kg CaCO3/t	<1	1	<1	1	
EA058: Emerson Aggregate Test								
Color (Munsell)		-	-		Dark Grayish Brown (2.5Y 4/2)	Grayish Brown (10YR 5/2)	Gray (10YR 5/1)	Very Dark Gray (10YR 3/1)
Texture		-	-		Sandy Loam	Light Medium Clay	Clay Loam	Light Medium Clay
Emerson Class Number	EC/TC	-	-		2	2	2	2
ED007: Exchangeable Cations								
Exchangeable Calcium		0.1	meq/100g		1.2	0.6	0.7	3.1
Exchangeable Magnesium		0.1	meq/100g		0.7	8.0	10.4	7.4
Exchangeable Potassium		0.1	meq/100g		<0.1	0.5	0.4	0.2
Exchangeable Sodium		0.1	meq/100g		0.2	2.5	3.2	1.4
Cation Exchange Capacity		0.1	meq/100g		2.1	11.7	14.8	12.1
Exchangeable Sodium Percent		0.1	%		8.4	21.6	21.9	11.7

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Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH41-3.0	BH44-0.1	BH44-1.0	BH44-2.0	BH44-3.0
		Sampli	ng date / time	19-May-2021 00:00	24-May-2021 00:00	24-May-2021 00:00	24-May-2021 00:00	24-May-2021 00:00
Compound	CAS Number	LOR	Unit	EM2110602-062	EM2110602-063	EM2110602-064	EM2110602-065	EM2110602-066
				Result	Result	Result	Result	Result
EA033-A: Actual Acidity								
pH KCI (23A)		0.1	pH Unit	6.1	5.0	4.8	4.9	4.8
Titratable Actual Acidity (23F)		2	mole H+/t	<2	16	16	15	8
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.02	0.02	0.02	0.02	<0.02
EA033-B: Potential Acidity								
Chromium Reducible Sulfur (22B)		0.005	% S	800.0	0.014	0.011	0.006	0.016
acidity - Chromium Reducible Sulfur		10	mole H+ / t	<10	<10	<10	<10	<10
(a-22B)								
EA033-E: Acid Base Accounting								
ANC Fineness Factor		0.5	-	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)		0.02	% S	<0.02	0.04	0.04	0.03	0.03
Net Acidity (acidity units)		10	mole H+ / t	<10	24	23	19	18
Liming Rate		1	kg CaCO3/t	<1	2	2	1	1
Net Acidity excluding ANC (sulfur units)		0.02	% S	<0.02	0.04	0.04	0.03	0.03
Net Acidity excluding ANC (acidity units)		10	mole H+ / t	<10	24	23	19	18
Liming Rate excluding ANC		1	kg CaCO3/t	<1	2	2	1	1

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Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	DUP05-210520	DUP07-210521	DUP09-210521	
		Sampli	ing date / time	20-May-2021 00:00	21-May-2021 00:00	21-May-2021 00:00	
Compound	CAS Number	LOR	Unit	EM2110602-067	EM2110602-068	EM2110602-069	
				Result	Result	Result	
EA033-A: Actual Acidity							
pH KCI (23A)		0.1	pH Unit		4.7		
Titratable Actual Acidity (23F)		2	mole H+ / t		18		
sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S		0.03		
EA033-B: Potential Acidity							
Chromium Reducible Sulfur (22B)		0.005	% S		0.017		
acidity - Chromium Reducible Sulfur		10	mole H+ / t		10		
(a-22B)							
EA033-E: Acid Base Accounting							
ANC Fineness Factor		0.5	-		1.5		
Net Acidity (sulfur units)		0.02	% S		0.04		
Net Acidity (acidity units)		10	mole H+ / t		29		
Liming Rate		1	kg CaCO3/t		2		
Net Acidity excluding ANC (sulfur units)		0.02	% S		0.04		
Net Acidity excluding ANC (acidity units)		10	mole H+ / t		29		
Liming Rate excluding ANC		1	kg CaCO3/t		2		
EA058: Emerson Aggregate Test							
Color (Munsell)		-	-	Olive Brown (2.5Y 4/3)		Light Olive Brown (2.5Y 5/3)	
Texture		-	-	Light Clay		Clay Loam	
Emerson Class Number	EC/TC	-	-	2		2	
ED007: Exchangeable Cations							
Exchangeable Calcium		0.1	meq/100g	0.6			
Exchangeable Magnesium		0.1	meq/100g	1.4			
Exchangeable Potassium		0.1	meq/100g	0.5			
Exchangeable Sodium		0.1	meq/100g	0.5			
Cation Exchange Capacity		0.1	meq/100g	3.0			
Exchangeable Sodium Percent		0.1	%	16.6			
ED008: Exchangeable Cations							
Exchangeable Calcium		0.1	meq/100g			1.0	
Exchangeable Magnesium		0.1	meq/100g			5.2	
Exchangeable Potassium		0.1	meq/100g			0.1	
Exchangeable Sodium		0.1	meq/100g			1.8	
Exchangeable Sodium Percent		0.1	%			21.9	
Cation Exchange Capacity		0.1	meq/100g			8.0	

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Client : WSP Australia Pty Ltd

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Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EA058: Emerson Aggregate Test

(SOIL) EA033-B: Potential Acidity

(SOIL) EA033-C: Acid Neutralising Capacity

(SOIL) EA033-D: Retained Acidity

(SOIL) EA033-A: Actual Acidity

(SOIL) EA033-E: Acid Base Accounting

(SOIL) EA029-D: Calcium Values

(SOIL) EA029-E: Magnesium Values

(SOIL) EA029-F: Excess Acid Neutralising Capacity

(SOIL) EA029-H: Acid Base Accounting

(SOIL) EA029-G: Retained Acidity

(SOIL) EA029-A: pH Measurements

(SOIL) EA029-C: Sulfur Trail

(SOIL) EA029-B: Acidity Trail





QUALITY CONTROL REPORT

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Amendment . 1

Client Laboratory : Environmental Division Melbourne : WSP Australia Pty Ltd

Contact : MR SHANE GILIAM

Address Address : Level 15, 28 Freshwater Place

SOUTHBANK VIC. AUSTRALIA 3006

Telephone : +61 03 9861 1111

Project : PS124554 Order number

C-O-C number

Sampler Site

Quote number : ME/167/21

No. of samples received : 68 No. of samples analysed : 68

Contact : Graeme Jablonskas

: 4 Westall Rd Springvale VIC Australia 3171

Telephone : +6138549 9609 Date Samples Received : 19-May-2021

Date Analysis Commenced : 05-Jun-2021

· 07-Jul-2021 Issue Date



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 Dilani Fernando Senior Inorganic Chemist Melbourne Inorganics, Springvale, VIC Kim McCabe Brisbane Acid Sulphate Soils, Stafford, QLD Senior Inorganic Chemist

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Client : WSP Australia Pty Ltd

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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

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 (%)	
A029-A: pH Measu	rements (QC Lot: 373	38887)								
EM2110602-053	BH33-0.5	EA029: pH KCI (23A)		0.1	pH Unit	5.4	5.4	0.0	0% - 20%	
		EA029: pH OX (23B)		0.1	pH Unit	5.1	5.0	2.0	0% - 20%	
A029-B: Acidity Tra	ail (QC Lot: 3738887)									
EM2110602-053	BH33-0.5	EA029: sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.020	<0.020	0.0	No Limit	
		EA029: sulfidic - Titratable Peroxide Acidity		0.02	% pyrite S	<0.020	<0.020	0.0	No Limit	
		(s-23G)								
		EA029: sulfidic - Titratable Sulfidic Acidity		0.02	% pyrite S	<0.020	<0.020	0.0	No Limit	
		(s-23H)								
		EA029: Titratable Actual Acidity (23F)		2	mole H+ / t	5	5	0.0	No Limit	
		EA029: Titratable Peroxide Acidity (23G)		2	mole H+ / t	6	5	0.0	No Limit	
		EA029: Titratable Sulfidic Acidity (23H)		2	mole H+ / t	<2	<2	0.0	No Limit	
A029-C: Sulfur Trai	il (QC Lot: 3738887)									
EM2110602-053	BH33-0.5	EA029: KCl Extractable Sulfur (23Ce)		0.02	% S	<0.020	<0.020	0.0	No Limit	
		EA029: Peroxide Sulfur (23De)		0.02	% S	<0.020	<0.020	0.0	No Limit	
		EA029: Peroxide Oxidisable Sulfur (23E)		0.02	% S	<0.020	<0.020	0.0	No Limit	
		EA029: acidity - Peroxide Oxidisable Sulfur		10	mole H+ / t	<10	<10	0.0	No Limit	
		(a-23E)								
A029-D: Calcium V	/alues (QC Lot: 37388	887)								
EM2110602-053	BH33-0.5	EA029: KCl Extractable Calcium (23Vh)		0.02	% Ca	0.024	0.023	0.0	No Limit	
		EA029: Peroxide Calcium (23Wh)		0.02	% Ca	0.024	0.024	0.0	No Limit	
		EA029: Acid Reacted Calcium (23X)		0.02	% Ca	<0.020	<0.020	0.0	No Limit	
		EA029: sulfidic - Acid Reacted Calcium (s-23X)		0.02	% S	<0.020	<0.020	0.0	No Limit	
		EA029: acidity - Acid Reacted Calcium (a-23X)		10	mole H+ / t	<10	<10	0.0	No Limit	

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Sub-Matrix: SOIL						Laboratory I	Duplicate (DUP) Report		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA029-E: Magnesiu	ım Values (QC Lot: 3	3738887) - continued							
EM2110602-053	BH33-0.5	EA029: KCl Extractable Magnesium (23Sm)		0.02	% Mg	<0.020	<0.020	0.0	No Limit
		EA029: Peroxide Magnesium (23Tm)		0.02	% Mg	<0.020	<0.020	0.0	No Limit
		EA029: Acid Reacted Magnesium (23U)		0.02	% Mg	<0.020	<0.020	0.0	No Limit
		EA029: sulfidic - Acid Reacted Magnesium		0.02	% S	<0.020	<0.020	0.0	No Limit
		(s-23U)							
		EA029: Acidity - Acid Reacted Magnesium		10	mole H+ / t	<10	<10	0.0	No Limit
		(a-23U)							
EA029-H: Acid Base	e Accounting (QC Lo	ot: 3738887)							
EM2110602-053	BH33-0.5	EA029: ANC Fineness Factor		0.5	-	1.5	1.5	0.0	No Limit
		EA029: Net Acidity (sulfur units)		0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)		0.02	% S	<0.02	<0.02	0.0	No Limit
		EA029: Liming Rate		1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Liming Rate excluding ANC		1	kg CaCO3/t	<1	<1	0.0	No Limit
		EA029: Net Acidity (acidity units)		10	mole H+ / t	<10	<10	0.0	No Limit
		EA029: Net Acidity excluding ANC (acidity units)		10	mole H+ / t	<10	<10	0.0	No Limit
EA033-A: Actual Ac	cidity (QC Lot: 37388	886)							
EB2116421-001	Anonymous	EA033: sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)		2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCI (23A)		0.1	pH Unit	9.5	9.6	0.0	0% - 20%
EM2110602-043	BH28-0.1	EA033: sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	0.02	0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)		2	mole H+ / t	14	13	0.0	No Limit
		EA033: pH KCl (23A)		0.1	pH Unit	5.1	5.1	0.0	0% - 20%
EA033-A: Actual Ac	cidity (QC Lot: 37388	188)							
EM2110602-061	BH41-1.0	EA033: sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.02	<0.02	0.0	No Limit
		EA033: Titratable Actual Acidity (23F)		2	mole H+ / t	<2	<2	0.0	No Limit
		EA033: pH KCI (23A)		0.1	pH Unit	6.1	6.1	0.0	0% - 20%
EA033-B: Potential	Acidity (QC Lot: 373	38886)							
EB2116421-001	Anonymous	EA033: Chromium Reducible Sulfur (22B)		0.005	% S	0.010	0.007	36.4	No Limit
	, , , , , , , , , , , , , , , , , , ,	EA033: acidity - Chromium Reducible Sulfur		10	mole H+ / t	<10	<10	0.0	No Limit
		(a-22B)							
EM2110602-043	BH28-0.1	EA033: Chromium Reducible Sulfur (22B)		0.005	% S	0.021	0.017	16.7	No Limit
		EA033: acidity - Chromium Reducible Sulfur		10	mole H+ / t	13	11	16.7	No Limit
		(a-22B)							
EA033-B: Potential	Acidity (QC Lot: 373	88888)							
EM2110602-061	BH41-1.0	EA033: Chromium Reducible Sulfur (22B)		0.005	% S	<0.005	0.008	46.0	No Limit
		EA033: acidity - Chromium Reducible Sulfur		10	mole H+ / t	<10	<10	0.0	No Limit
		(a-22B)							
ED006: Exchangeal	ble Cations on Alkali	ne Soils (QC Lot: 3719993)							
EM2110602-001	BH01-0.5	ED006: Calcium/Magnesium Ratio		0.1	-	0.3	0.3	0.0	No Limit
		ED000. Galolatin Magriesiatii Tatio						•	

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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 (%)	
ED006: Exchangeab	ole Cations on Alkali	ine Soils (QC Lot: 3719993) - continued								
EM2110602-001	BH01-0.5	ED006: Magnesium/Potassium Ratio		0.1	-	23.6	24.4	3.2	0% - 20%	
		ED006: Exchangeable Calcium Percent		0.2	%	18.5	18.8	1.9	0% - 20%	
		ED006: Exchangeable Magnesium Percent		0.2	%	62.6	62.5	0.0	0% - 20%	
		ED006: Exchangeable Potassium Percent		0.2	%	2.6	2.6	0.0	0% - 50%	
		ED006: Exchangeable Sodium Percent		0.2	%	16.3	16.0	1.3	0% - 20%	
		ED006: Exchangeable Calcium		0.2	meq/100g	1.9	2.0	0.0	0% - 50%	
		ED006: Exchangeable Magnesium		0.2	meq/100g	6.6	6.8	2.6	0% - 20%	
		ED006: Exchangeable Potassium		0.2	meq/100g	0.3	0.3	0.0	No Limit	
		ED006: Exchangeable Sodium		0.2	meq/100g	1.7	1.7	0.0	No Limit	
		ED006: Cation Exchange Capacity		0.2	meq/100g	10.5	10.8	2.7	0% - 20%	
ED006: Exchangeab	ole Cations on Alkali	ine Soils (QC Lot: 3719995)								
EM2110602-051	BH32-2.0	ED006: Calcium/Magnesium Ratio		0.1	-	<0.2	<0.2	0.0	No Limit	
		ED006: Magnesium/Potassium Ratio		0.1	-	28.1	28.4	1.0	0% - 20%	
		ED006: Exchangeable Calcium Percent		0.2	%	10.6	10.8	2.5	0% - 20%	
		ED006: Exchangeable Magnesium Percent		0.2	%	54.2	54.3	0.0	0% - 20%	
		ED006: Exchangeable Potassium Percent		0.2	%	1.9	1.9	0.0	No Limit	
		ED006: Exchangeable Sodium Percent		0.2	%	33.3	33.0	0.9	0% - 20%	
		ED006: Exchangeable Calcium		0.2	meg/100g	1.5	1.5	0.0	No Limit	
		ED006: Exchangeable Magnesium		0.2	meg/100g	7.6	7.7	0.0	0% - 20%	
		ED006: Exchangeable Potassium		0.2	meg/100g	0.3	0.3	0.0	No Limit	
		ED006: Exchangeable Sodium		0.2	meq/100g	4.7	4.6	0.0	0% - 20%	
		ED006: Cation Exchange Capacity		0.2	meq/100g	14.0	14.1	0.9	0% - 20%	
ED007: Exchangeab	ole Cations (QC Lot:									
EM2110602-005	BH02-0.1	ED007: Exchangeable Sodium Percent		0.1	%	14.8	14.9	0.0	0% - 20%	
		ED007: Exchangeable Calcium		0.1	meg/100g	3.3	3.3	0.0	0% - 20%	
		ED007: Exchangeable Magnesium		0.1	meg/100g	7.1	7.1	0.0	0% - 20%	
		ED007: Exchangeable Potassium		0.1	meg/100g	0.2	0.2	0.0	No Limit	
		ED007: Exchangeable Sodium		0.1	meg/100g	1.8	1.8	0.0	0% - 50%	
		ED007: Cation Exchange Capacity		0.1	meg/100g	12.4	12.4	0.0	0% - 20%	
FD007: Exchangeah	ole Cations (QC Lot:									
EM2110602-024	BH19-0.5	ED007: Exchangeable Sodium Percent		0.1	%	14.3	14.3	0.0	0% - 20%	
LIVIZ 1 10002-024	B1119-0.5	ED007: Exchangeable Sodium Percent ED007: Exchangeable Calcium		0.1	meq/100g	0.7	0.7	0.0	No Limit	
		<u> </u>		0.1	meq/100g	1.3	1.3	0.0	0% - 50%	
		ED007: Exchangeable Magnesium ED007: Exchangeable Potassium		0.1	meq/100g	0.4	0.4	0.0	No Limit	
		ED007: Exchangeable Potassium ED007: Exchangeable Sodium		0.1	meq/100g	0.4	0.4	0.0	No Limit	
		ED007: Exchangeable Sodium ED007: Cation Exchange Capacity		0.1	meq/100g	2.8	2.8	0.0	0% - 20%	
EM2110602-044	BH28-0.5	0		0.1	%	12.6	12.8	1.9	0% - 20%	
LIVE 1 10002-044	51120 0.0	ED007: Exchangeable Colcium		0.1	meg/100g	1.9	1.9	0.0	0% - 50%	
		ED007: Exchangeable Calcium		0.1	meq/100g	3.5	3.5	0.0	0% - 20%	
		ED007: Exchangeable Magnesium ED007: Exchangeable Potassium		0.1	meq/100g	<0.1	0.1	0.0	No Limit	
		EDUUT. EXCHAINGEADIE POLASSIUM		U. I	meq/100g	70.1	0.1	0.0	INO LIIIIL	

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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 (%)	
ED007: Exchangeab	ole Cations (QC Lot: 371999))) - continued								
EM2110602-044	BH28-0.5	ED007: Exchangeable Sodium		0.1	meq/100g	0.8	0.8	0.0	No Limit	
		ED007: Cation Exchange Capacity		0.1	meq/100g	6.3	6.3	0.0	0% - 20%	
ED007: Exchangeab	ole Cations (QC Lot: 3719992	2)								
EM2110602-045	BH28-1.0	ED007: Exchangeable Sodium Percent		0.1	%	13.5	13.9	3.0	0% - 20%	
		ED007: Exchangeable Calcium		0.1	meq/100g	1.6	1.6	0.0	0% - 50%	
		ED007: Exchangeable Magnesium		0.1	meq/100g	4.2	4.2	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	0.9	1.0	0.0	No Limit	
		ED007: Cation Exchange Capacity		0.1	meq/100g	6.7	6.8	0.0	0% - 20%	
ED008: Exchangeab	ole Cations (QC Lot: 371998	7)								
EM2110602-009	BH08-1.0	ED008: Exchangeable Sodium Percent		0.1	%	20.8	20.8	0.0	0% - 20%	
		ED008: Exchangeable Calcium		0.1	meq/100g	1.7	1.7	0.0	0% - 50%	
		ED008: Exchangeable Magnesium		0.1	meq/100g	7.6	7.6	0.0	0% - 20%	
		ED008: Exchangeable Potassium		0.1	meq/100g	0.2	0.2	0.0	No Limit	
		ED008: Exchangeable Sodium		0.1	meq/100g	2.5	2.5	0.0	0% - 20%	
		ED008: Cation Exchange Capacity		0.1	meq/100g	11.9	12.0	0.0	0% - 20%	
ED008: Exchangeab	ole Cations (QC Lot: 371999									
EM2110602-058	BH36-2.0	ED008: Exchangeable Sodium Percent		0.1	%	18.2	18.2	0.0	0% - 20%	
		ED008: Exchangeable Calcium		0.1	meq/100g	1.6	1.6	0.0	0% - 50%	
		ED008: Exchangeable Magnesium		0.1	meq/100g	6.4	6.4	0.0	0% - 20%	
		ED008: Exchangeable Potassium		0.1	meq/100g	0.1	0.1	0.0	No Limit	
		ED008: Exchangeable Sodium		0.1	meq/100g	1.8	1.8	0.0	0% - 50%	
		ED008: Cation Exchange Capacity		0.1	meq/100g	9.9	9.8	0.0	0% - 20%	

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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)		Laboratory Control Spike (LC	S) Report	
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA029-A: pH Measurements (QCLot: 3738887)								
EA029: pH KCl (23A)		0.1	pH Unit	<0.1	4.4 pH Unit	104	70.0	130
EA029: pH OX (23B)		0.1	pH Unit	<0.1	4.2 pH Unit	107	70.0	130
EA029-B: Acidity Trail (QCLot: 3738887)								
EA029: Titratable Actual Acidity (23F)		2	mole H+/t	<2	15 mole H+ / t	107	70.0	130
EA029: Titratable Peroxide Acidity (23G)		2	mole H+ / t	<2	27.5 mole H+ / t	105	70.0	130
EA029: Titratable Sulfidic Acidity (23H)		2	mole H+ / t	<2				
EA029: sulfidic - Titratable Actual Acidity (s-23F)		0.02	% pyrite S	<0.020				
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)		0.02	% pyrite S	<0.020				
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)		0.02	% pyrite S	<0.020				
EA029-C: Sulfur Trail (QCLot: 3738887)								
EA029: KCl Extractable Sulfur (23Ce)		0.02	% S	<0.020	0.04779 % S	96.1	70.0	130
EA029: Peroxide Sulfur (23De)		0.02	% S	<0.020	0.20322 % S	91.2	70.0	130
EA029: Peroxide Oxidisable Sulfur (23E)		0.02	% S	<0.020				
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)		10	mole H+ / t	<10				
EA029-D: Calcium Values (QCLot: 3738887)								
EA029: KCI Extractable Calcium (23Vh)		0.02	% Ca	<0.020	0.14152 % Ca	116	70.0	130
EA029: Peroxide Calcium (23Wh)		0.02	% Ca	<0.020	0.19926 % Ca	108	70.0	130
EA029: Acid Reacted Calcium (23X)		0.02	% Ca	<0.020				
EA029: acidity - Acid Reacted Calcium (a-23X)		10	mole H+ / t	<10				
EA029: sulfidic - Acid Reacted Calcium (s-23X)		0.02	% S	<0.020				
EA029-E: Magnesium Values (QCLot: 3738887)								
EA029: KCI Extractable Magnesium (23Sm)		0.02	% Mg	<0.020	0.213 % Mg	81.4	70.0	130
EA029: Peroxide Magnesium (23Tm)		0.02	% Mg	<0.020	0.22344 % Mg	112	70.0	130
EA029: Acid Reacted Magnesium (23U)		0.02	% Mg	<0.020				
EA029: Acidity - Acid Reacted Magnesium (a-23U)		10	mole H+/t	<10				
EA029: sulfidic - Acid Reacted Magnesium (s-23U)		0.02	% S	<0.020				
EA029-H: Acid Base Accounting (QCLot: 3738887)								
EA029: ANC Fineness Factor		0.5	-	<0.5				
EA029: Net Acidity (sulfur units)		0.02	% S	<0.02				
EA029: Net Acidity (acidity units)		10	mole H+ / t	<10				
EA029: Liming Rate		1	kg CaCO3/t	<1				
EA029: Net Acidity excluding ANC (sulfur units)		0.02	% S	<0.02				
EA029: Net Acidity excluding ANC (acidity units)		10	mole H+ / t	<10				
EA029: Liming Rate excluding ANC		1	kg CaCO3/t	<1				

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Sub-Matrix: SOIL			Method Blank (MB)		Laboratory Control Spike (LC	S) Report	
			Report	Spike	Spike Recovery (%)	Acceptabl	e Limits (%)
Method: Compound CAS Nun	ber LOR	Unit	Result	Concentration	LCS	Low	High
EA033-A: Actual Acidity (QCLot: 3738886)							
EA033: pH KCI (23A)		pH Unit		4.4 pH Unit	100	91.0	107
EA033: Titratable Actual Acidity (23F)	2	mole H+ / t	<2	15 mole H+ / t	107	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	0.02	% pyrite S	<0.02				
EA033-A: Actual Acidity (QCLot: 3738888)							
		pH Unit		4.4 pH Unit	99.9	91.0	107
EA033: Titratable Actual Acidity (23F)	2	mole H+ / t	<2	15 mole H+ / t	103	70.0	124
EA033: sulfidic - Titratable Actual Acidity (s-23F)	0.02	% pyrite S	<0.02				
EA033-B: Potential Acidity (QCLot: 3738886)							
· ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `	0.005	% S	<0.005	0.155 % S	92.8	77.0	121
\ /	10	mole H+ / t	<10				
EA033-B: Potential Acidity (QCLot: 3738888)				<u> </u>			
	0.005	% S	<0.005	0.155 % S	95.4	77.0	121
EA033: acidity - Chromium Reducible Sulfur (a-22B)	10	mole H+ / t	<10				
ED006: Exchangeable Cations on Alkaline Soils (QCLot: 3719993)							
·	0.2	meq/100g	<0.2	33 meq/100g	79.0	66.6	101
	0.2	meg/100g	<0.2	32 meg/100g	80.2	66.9	120
	0.2	meq/100g	<0.2	2.2 meg/100g	101	72.8	119
	0.2	meg/100g	<0.2	5.6 meg/100g	91.6	67.5	112
	0.2	meq/100g	<0.2				
<u> </u>	0.2	%	<0.2				
	0.2	%	<0.2				
Ţ Ţ	0.2	%	<0.2				
	0.1	-	<0.1				
	0.1	-	<0.1				
ED007: Exchangeable Cations (QCLot: 3719988)							
· · · · · · · · · · · · · · · · · · ·	0.1	meq/100g	<0.1	24.13 meq/100g	98.7	80.0	130
	0.1	meq/100g	<0.1	1.96 meq/100g	119	72.2	130
	0.1	meq/100g	<0.1	1.01 meq/100g	118	77.4	130
ED007: Exchangeable Sodium	0.1	meq/100g	<0.1	0.86 meq/100g	103	89.2	130
ED007: Cation Exchange Capacity	0.1	meq/100g	<0.1				
ED007: Exchangeable Cations (QCLot: 3719990)							
- Carlotte C	0.1	meq/100g	<0.1	24.13 meq/100g	97.9	80.0	130
ED007: Exchangeable Magnesium	0.1	meq/100g	<0.1	1.96 meq/100g	120	72.2	130
ED007: Exchangeable Potassium	0.1	meq/100g	<0.1	1.01 meq/100g	116	77.4	130
ED007: Exchangeable Sodium	0.1	meq/100g	<0.1	0.86 meq/100g	104	89.2	130
ED007: Cation Exchange Capacity	0.1	meq/100g	<0.1				
ED007: Exchangeable Cations (QCLot: 3719992)							
· · · · · · · · · · · · · · · · · · ·	0.1	meq/100g	<0.1	24.13 meq/100g	95.9	80.0	130
<u> </u>			1		1		

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Sub-Matrix: SOIL	Method Blank (MB)	Method Blank (MB)		Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED007: Exchangeable Cations (QCLot: 3719992) - continued								
ED007: Exchangeable Magnesium		0.1	meq/100g	<0.1	1.96 meq/100g	119	72.2	130
ED007: Exchangeable Potassium		0.1	meq/100g	<0.1	1.01 meq/100g	117	77.4	130
ED007: Exchangeable Sodium		0.1	meq/100g	<0.1	0.86 meq/100g	103	89.2	130
ED007: Cation Exchange Capacity		0.1	meq/100g	<0.1				
ED008: Exchangeable Cations (QCLot: 3719987)								
ED008: Exchangeable Calcium		0.1	meq/100g	<0.1	24.44 meq/100g	86.0	70.0	130
ED008: Exchangeable Magnesium		0.1	meq/100g	<0.1	1.65 meq/100g	98.1	70.0	130
ED008: Exchangeable Potassium		0.1	meq/100g	<0.1	0.83 meq/100g	115	83.4	130
ED008: Exchangeable Sodium		0.1	meq/100g	<0.1	0.31 meq/100g	129	85.2	130
ED008: Cation Exchange Capacity		0.1	meq/100g	<0.1				

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.

• No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EM2110602** Page : 1 of 11

Amendment : 1

Client : WSP Australia Pty Ltd Laboratory : Environmental Division Melbourne

 Contact
 : MR SHANE GILIAM
 Telephone
 : +6138549 9609

 Project
 : PS124554
 Date Samples Received
 : 19-May-2021

 Site
 --- Issue Date
 : 07-Jul-2021

Site :--- Issue Date : 07-Jul-2021
Sampler :--- No. of samples received : 68

Sampler : ---- No. of samples received : 68
Order number : ---- No. of samples analysed : 68

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.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers: Analysis Holding Time Compliance

NO Analysis Holding Time Outliers exist.

Outliers: Frequency of Quality Control Samples

• NO Quality Control Sample Frequency Outliers exist.

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Client : WSP Australia Pty Ltd

Project : PS124554



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 <u>VOC in soils</u> 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.

ix: SOIL Evaluation: × = Holding time breach; ✓ = Within holding time

Matrix: SOIL				Evaluation	n: 🗴 = Holding time	breach; ✓ = Withi	n holding time
Method	Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements							
Snap Lock Bag - frozen on receipt at ALS (EA029) BH33-0.5	20-May-2021	17-Jun-2021	13-Feb-2024	1	17-Jun-2021	15-Sep-2021	✓
EA029-B: Acidity Trail							
Snap Lock Bag - frozen on receipt at ALS (EA029) BH33-0.5	20-May-2021	17-Jun-2021	13-Feb-2024	1	17-Jun-2021	15-Sep-2021	✓
EA029-C: Sulfur Trail							
Snap Lock Bag - frozen on receipt at ALS (EA029) BH33-0.5	20-May-2021	17-Jun-2021	13-Feb-2024	✓	17-Jun-2021	15-Sep-2021	✓
EA029-D: Calcium Values							
Snap Lock Bag - frozen on receipt at ALS (EA029) BH33-0.5	20-May-2021	17-Jun-2021	13-Feb-2024	1	17-Jun-2021	15-Sep-2021	✓
EA029-E: Magnesium Values							
Snap Lock Bag - frozen on receipt at ALS (EA029) BH33-0.5	20-May-2021	17-Jun-2021	13-Feb-2024	1	17-Jun-2021	15-Sep-2021	✓
EA029-F: Excess Acid Neutralising Capacity							
Snap Lock Bag - frozen on receipt at ALS (EA029) BH33-0.5	20-May-2021	17-Jun-2021	13-Feb-2024	1	17-Jun-2021	15-Sep-2021	✓
EA029-G: Retained Acidity							
Snap Lock Bag - frozen on receipt at ALS (EA029) BH33-0.5	20-May-2021	17-Jun-2021	13-Feb-2024	✓	17-Jun-2021	15-Sep-2021	✓
EA029-H: Acid Base Accounting							
Snap Lock Bag - frozen on receipt at ALS (EA029) BH33-0.5	20-May-2021	17-Jun-2021	13-Feb-2024	✓	17-Jun-2021	15-Sep-2021	✓

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PS124554 Project



Matrix: SOIL					Evaluation	n: × = Holding time	breach ; ✓ = With	n holding time
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-A: Actual Acidity								
Snap Lock Bag - frozen on receipt at ALS (EA033)								
BH41-0.5,	BH41-1.0,	19-May-2021	17-Jun-2021	19-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH41-3.0								
Snap Lock Bag - frozen on receipt at ALS (EA033)	DU00 0 5	20 Maria 2004	47 1 0004	20 May 2000		47 1 0004	45 0 2004	
BH33-0.1,	BH33-0.5,	20-May-2021	17-Jun-2021	20-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH33-1.0,	BH33-2.0							
Snap Lock Bag - frozen on receipt at ALS (EA033)	Bulli o i	04 Marri 0004	47 1 0004	04 May 2000		47 1 0004	45 0 2004	
BH03-0.1,	BH11-0.1,	21-May-2021	17-Jun-2021	21-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH11-0.5,	BH11-1.0,							
BH11-2.0,	BH11-3.0,							
DUP07-210521								
Snap Lock Bag - frozen on receipt at ALS (EA033)		04.84	47 1	04.140000		47.1	45.0 0004	
BH28-0.1,	BH28-0.5,	24-May-2021	17-Jun-2021	24-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH28-1.0,	BH28-2.0,							
BH28-3.0,	BH44-0.1,							
BH44-1.0,	BH44-2.0,							
BH44-3.0								
EA033-B: Potential Acidity								
Snap Lock Bag - frozen on receipt at ALS (EA033)								
BH41-0.5,	BH41-1.0,	19-May-2021	17-Jun-2021	19-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH41-3.0								
Snap Lock Bag - frozen on receipt at ALS (EA033)								
BH33-0.1,	BH33-0.5,	20-May-2021	17-Jun-2021	20-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH33-1.0,	BH33-2.0							
Snap Lock Bag - frozen on receipt at ALS (EA033)				04.14 0000			45.0 0004	
BH03-0.1,	BH11-0.1,	21-May-2021	17-Jun-2021	21-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH11-0.5,	BH11-1.0,							
BH11-2.0,	BH11-3.0,							
DUP07-210521								
Snap Lock Bag - frozen on receipt at ALS (EA033)				04.14			450	
BH28-0.1,	BH28-0.5,	24-May-2021	17-Jun-2021	24-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH28-1.0,	BH28-2.0,							
BH28-3.0,	BH44-0.1,							
BH44-1.0,	BH44-2.0,							
BH44-3.0								

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Client : WSP Australia Pty Ltd



Matrix: SOIL					Evaluation	ı: 🗴 = Holding time	breach ; ✓ = Withi	n holding time
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-C: Acid Neutralising Capacity								
Snap Lock Bag - frozen on receipt at ALS (EA033) BH41-0.5, BH41-3.0	BH41-1.0,	19-May-2021	17-Jun-2021	19-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) BH33-0.1, BH33-1.0, Snap Lock Bag - frozen on receipt at ALS (EA033) BH03-0.1,	BH33-0.5, BH33-2.0 BH11-0.1,	20-May-2021 21-May-2021	17-Jun-2021 17-Jun-2021	20-May-2022 21-May-2022	✓ ✓	17-Jun-2021 17-Jun-2021	15-Sep-2021 15-Sep-2021	✓
BH11-0.5, BH11-2.0, DUP07-210521	BH11-1.0, BH11-3.0,							
Snap Lock Bag - frozen on receipt at ALS (EA033) BH28-0.1, BH28-1.0, BH28-3.0, BH44-1.0, BH44-3.0	BH28-0.5, BH28-2.0, BH44-0.1, BH44-2.0,	24-May-2021	17-Jun-2021	24-May-2022	1	17-Jun-2021	15-Sep-2021	✓
EA033-D: Retained Acidity								
Snap Lock Bag - frozen on receipt at ALS (EA033) BH41-0.5, BH41-3.0	BH41-1.0,	19-May-2021	17-Jun-2021	19-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) BH33-0.1, BH33-1.0,	ВН33-0.5, ВН33-2.0	20-May-2021	17-Jun-2021	20-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) BH03-0.1, BH11-0.5, BH11-2.0, DUP07-210521	BH11-0.1, BH11-1.0, BH11-3.0,	21-May-2021	17-Jun-2021	21-May-2022	1	17-Jun-2021	15-Sep-2021	✓
Snap Lock Bag - frozen on receipt at ALS (EA033) BH28-0.1, BH28-1.0, BH28-3.0, BH44-1.0, BH44-3.0	BH28-0.5, BH28-2.0, BH44-0.1, BH44-2.0,	24-May-2021	17-Jun-2021	24-May-2022	1	17-Jun-2021	15-Sep-2021	✓

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Client : WSP Australia Pty Ltd



Matrix: SOIL					Evaluation	n: 🗴 = Holding time	breach; ✓ = Withi	n holding time
Method		Sample Date	E:	ktraction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA033-E: Acid Base Accounting								
Snap Lock Bag - frozen on receipt at AL	S (EA033)							
BH41-0.5,	BH41-1.0,	19-May-2021	17-Jun-2021	19-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH41-3.0								
Snap Lock Bag - frozen on receipt at AL	S (EA033)							
BH33-0.1,	BH33-0.5,	20-May-2021	17-Jun-2021	20-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH33-1.0,	BH33-2.0							
Snap Lock Bag - frozen on receipt at AL	S (EA033)							
BH03-0.1,	BH11-0.1,	21-May-2021	17-Jun-2021	21-May-2022	✓	17-Jun-2021	15-Sep-2021	✓
BH11-0.5,	BH11-1.0,							
BH11-2.0,	BH11-3.0,							
DUP07-210521								
Snap Lock Bag - frozen on receipt at AL	S (EA033)							
BH28-0.1,	BH28-0.5,	24-May-2021	17-Jun-2021	24-May-2022	1	17-Jun-2021	15-Sep-2021	✓
BH28-1.0,	BH28-2.0,							
BH28-3.0,	BH44-0.1,							
BH44-1.0,	BH44-2.0,							
BH44-3.0								

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Client : WSP Australia Pty Ltd



Matrix: SOIL					Evaluation	n: × = Holding time	breach; ✓ = With	n holding tim
Method		Sample Date	E	xtraction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA058: Emerson Aggregate Test								
Snap Lock Bag (EA058)								
BH01-0.5,	BH01-1.0,	19-May-2021				21-Jun-2021	15-Nov-2021	✓
BH01-2.0,	BH01-3.0,							
BH02-0.1,	BH02-0.5,							
BH02-1.0,	BH08-1.0,							
BH08-2.0,	BH19-0.1,							
BH19-0.5,	BH19-1.0,							
BH19-2.0,	BH21-0.5,							
BH21-1.0,	BH21-2.0,							
BH24-0.5,	BH24-1.0,							
BH24-2.0,	BH25-0.1,							
BH25-0.5,	BH25-1.0,							
BH25-2.0								
Snap Lock Bag (EA058)								
BH26-0.5,	BH26-1.0,	20-May-2021				21-Jun-2021	16-Nov-2021	✓
BH26-2.0,	BH32-0.1,							
BH32-0.5,	BH32-1.0,							
BH32-2.0,	BH33-0.5,							
BH33-1.0,	BH33-2.0,							
DUP05-210520								
Snap Lock Bag (EA058)								
BH09-0.1,	BH09-1.0,	21-May-2021				21-Jun-2021	17-Nov-2021	✓
BH11-0.5,	BH11-1.0,							
BH11-2.0,	BH11-3.0,							
BH17-0.5,	BH17-1.0,							
BH17-2.0,	BH17-3.0,							
BH22-0.5,	BH22-1.0,							
BH22-2.0,	DUP09-210521							
Snap Lock Bag (EA058)								
BH28-0.5,	BH28-1.0,	24-May-2021				21-Jun-2021	20-Nov-2021	✓
BH28-2.0,	BH36-0.5,							
BH36-1.0,	BH36-2.0,							
BH36-3.0								

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Project PS124554



Matrix: SOIL					Evaluation	n: × = Holding time	breach; ✓ = With	in holding time
Method		Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED006: Exchangeable Cations on Alkaline Soils	s							
Soil Glass Jar - Unpreserved (ED006)								
BH01-0.5,	BH01-1.0,	19-May-2021	05-Jun-2021	16-Jun-2021	✓	09-Jun-2021	16-Jun-2021	✓
BH01-2.0,	BH01-3.0,							
BH02-0.1,	BH02-0.5,							
BH02-1.0,	BH08-1.0,							
BH08-2.0,	BH19-0.1,							
BH19-0.5,	BH19-1.0,							
BH19-2.0,	BH21-0.5,							
BH21-1.0,	BH21-2.0,							
BH24-0.5,	BH24-1.0,							
BH24-2.0,	BH25-0.1,							
BH25-0.5,	BH25-1.0,							
BH25-2.0								
Soil Glass Jar - Unpreserved (ED006)								
BH26-0.5,	BH26-1.0,	20-May-2021	05-Jun-2021	17-Jun-2021	✓	09-Jun-2021	17-Jun-2021	✓
BH26-2.0,	BH32-0.1,							
BH32-0.5,	BH32-1.0,							
BH32-2.0,	BH33-0.5,							
BH33-1.0,	BH33-2.0,							
DUP05-210520								
Soil Glass Jar - Unpreserved (ED006)								
BH09-0.1,	BH09-1.0,	21-May-2021	05-Jun-2021	18-Jun-2021	✓	09-Jun-2021	18-Jun-2021	✓
BH11-0.5,	BH11-1.0,							
BH11-2.0,	BH11-3.0,							
BH17-0.5,	BH17-1.0,							
BH17-2.0,	BH17-3.0,							
BH22-0.5,	BH22-1.0,							
BH22-2.0,	DUP09-210521							
Soil Glass Jar - Unpreserved (ED006)								
BH28-0.5,	BH28-1.0,	24-May-2021	05-Jun-2021	21-Jun-2021	✓	09-Jun-2021	21-Jun-2021	✓
BH28-2.0,	BH36-0.5,							
BH36-1.0,	BH36-2.0,							
BH36-3.0								

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Matrix: SOIL					Evaluation	n: × = Holding time	e breach ; ✓ = With	n holding time
Method		Sample Date	E	ktraction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED007: Exchangeable Cations								
Soil Glass Jar - Unpreserved (ED007)								
BH01-0.5,	BH01-1.0,	19-May-2021	05-Jun-2021	16-Jun-2021	✓	09-Jun-2021	16-Jun-2021	✓
BH01-2.0,	BH01-3.0,							
BH02-0.1,	BH02-0.5,							
BH02-1.0,	BH08-1.0,							
BH08-2.0,	BH19-0.1,							
BH19-0.5,	BH19-1.0,							
BH19-2.0,	BH21-0.5,							
BH21-1.0,	BH21-2.0,							
BH24-0.5,	BH24-1.0,							
BH24-2.0,	BH25-0.1,							
BH25-0.5,	BH25-1.0,							
BH25-2.0								
Soil Glass Jar - Unpreserved (ED007)								
BH26-0.5,	BH26-1.0,	20-May-2021	05-Jun-2021	17-Jun-2021	✓	09-Jun-2021	17-Jun-2021	✓
BH26-2.0,	BH32-0.1,							
BH32-0.5,	BH32-1.0,							
BH32-2.0,	BH33-0.5,							
BH33-1.0,	BH33-2.0,							
DUP05-210520								
Soil Glass Jar - Unpreserved (ED007)								
BH09-0.1,	BH09-1.0,	21-May-2021	05-Jun-2021	18-Jun-2021	✓	09-Jun-2021	18-Jun-2021	✓
BH11-0.5,	BH11-1.0,							
BH11-2.0,	BH11-3.0,							
BH17-0.5,	BH17-1.0,							
BH17-2.0,	BH17-3.0,							
BH22-0.5,	BH22-1.0,							
BH22-2.0,	DUP09-210521							
Soil Glass Jar - Unpreserved (ED007)								
BH28-0.5,	BH28-1.0,	24-May-2021	05-Jun-2021	21-Jun-2021	✓	09-Jun-2021	21-Jun-2021	✓
BH28-2.0,	BH36-0.5,							
BH36-1.0,	BH36-2.0,							
BH36-3.0								

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Client : WSP Australia Pty Ltd



Method		Sample Date	F	traction / Preparation			Analysis	
Container / Client Sample ID(s)		Sample Bate	Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED008: Exchangeable Cations				<u> </u>			-	I.
Soil Glass Jar - Unpreserved (ED008)								
BH01-0.5,	BH01-1.0,	19-May-2021	05-Jun-2021	16-Jun-2021	✓	09-Jun-2021	16-Jun-2021	✓
BH01-2.0,	BH01-3.0,							,
BH02-0.1,	BH02-0.5,							
BH02-1.0,	BH08-1.0,							
BH08-2.0,	BH19-0.1,							
BH19-0.5,	BH19-1.0,							
BH19-2.0,	BH21-0.5,							
BH21-1.0,	BH21-2.0,							
BH24-0.5,	BH24-1.0,							
BH24-2.0,	BH25-0.1,							
BH25-0.5,	BH25-1.0,							
BH25-2.0								
Soil Glass Jar - Unpreserved (ED008)								
BH26-0.5,	BH26-1.0,	20-May-2021	05-Jun-2021	17-Jun-2021	✓	09-Jun-2021	17-Jun-2021	✓
BH26-2.0,	BH32-0.1,							
BH32-0.5,	BH32-1.0,							
BH32-2.0,	BH33-0.5,							
BH33-1.0,	BH33-2.0,							
DUP05-210520								
Soil Glass Jar - Unpreserved (ED008)								
BH09-0.1,	BH09-1.0,	21-May-2021	05-Jun-2021	18-Jun-2021	✓	09-Jun-2021	18-Jun-2021	✓
BH11-0.5,	BH11-1.0,							
BH11-2.0,	BH11-3.0,							
BH17-0.5,	BH17-1.0,							
BH17-2.0,	BH17-3.0,							
BH22-0.5,	BH22-1.0,							
BH22-2.0,	DUP09-210521							
Soil Glass Jar - Unpreserved (ED008)								
BH28-0.5,	BH28-1.0,	24-May-2021	05-Jun-2021	21-Jun-2021	✓	09-Jun-2021	21-Jun-2021	✓
BH28-2.0,	BH36-0.5,							
BH36-1.0,	BH36-2.0,							
BH36-3.0								

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PS124554 Project



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				Evaluatio	n: × = Quality Co	entrol frequency	not within specification; ✓ = Quality Control frequency within specification.
Quality Control Sample Type		С	ount		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Chromium Suite for Acid Sulphate Soils	EA033	3	30	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	4	31	12.90	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and	EA029	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulphate							
Laboratory Control Samples (LCS)							
Chromium Suite for Acid Sulphate Soils	EA033	2	30	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	3	31	9.68	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and	EA029	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulphate							
Method Blanks (MB)							
Chromium Suite for Acid Sulphate Soils	EA033	2	30	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	3	31	9.68	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations with pre-treatment	ED008	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspension Peroxide Oxidation-Combined Acidity and	EA029	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulphate							

Page : 11 of 11

Work Order : EM2110602 Amendment 1
Client : WSP Australia Pty Ltd

Project : PS124554



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
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	In house: Referenced to Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Chromium Suite for Acid Sulphate Soils	EA033	SOIL	In house: Referenced to Ahern et al 2004. This method covers the determination of Chromium Reducible Sulfur (SCR); pHKCl; titratable actual acidity (TAA); acid neutralising capacity by back titration (ANC); and net acid soluble sulfur (SNAS) which incorporates peroxide sulfur. It applies to soils and sediments (including sands) derived from coastal regions. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Emerson Aggregate Test	EA058	SOIL	In house: Referenced to AS1289.3.8.1. Testing is performed only on soils with suitable aggregates; sands and gravels are usually unsuitable for this test. The test classifies the behaviour of soil aggregates, when immersed, on their coherence in water.
Exchangeable Cations on Alkaline Soils	* ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meg/100g of original soil.
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).
Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method (Alkaline Soils)	ED006PR	SOIL	In house: Referenced to Rayment and Lyons method 15C1.
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.
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house
1:5 solid / water leach following drying at 40°C	EN34-AD	SOIL	10 g of 40°C dried 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.



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NATA # 1261 Site # 18217

NATA # 1261 Site # 40017 in smallwood Place Murarrie QLD 4172 Phone: +61 7 3902 4600 NATA # 1261 Site # 40017 1/21 Smallwood Place NATA # 1261 Site # 20794

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Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone: +61 2 4968 8448 NATA # 1261 Site # 25079 **Auckland** 35 O'Rorke Road Penrose, Auckland 1061 Phone: +64 9 526 45 51 IANZ # 1327

New Zealand

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

Sample Receipt Advice

Company name:

WSP Australia P/L MELB

Contact name: Project name:

Shane Giliam OFFICER SOUTH

Project ID: Turnaround time: PS124554 5 Day

797539

Date/Time received

May 24, 2021 2:27 PM

Eurofins reference

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

Contact

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

Harry Bacalis on phone: or by email: HarryBacalis@eurofins.com

Results will be delivered electronically via email to Shane Giliam - sgiliam@pb.com.au.

Note: A copy of these results will also be delivered to the general WSP Australia P/L MELB email address.





Environment Testing

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WSP Australia P/L MELB

Address: Lvl 15, 28 FreshwaterPlace

Southbank

VIC 3006

Project Name:

Company Name:

OFFICER SOUTH

Project ID:

PS124554

Order No.: Report #:

797539

Phone: 9861 1111 **Fax:** 9861 1144

Received: May 24, 2021 2:27 PM

Due: May 31, 2021 **Priority:** 5 Day

Contact Name: Shane Giliam

Eurofins Analytical Services Manager: Harry Bacalis

New Zealand

		Sa	mple Detail			HOLD	Acid Sulfate Soils Field pH Test
Melb	ourne Laborato	ory - NATA Site	# 1254 & 142	71		Х	
Sydr	ney Laboratory	- NATA Site # 1	8217				
Brist	pane Laboratory	y - NATA Site #	20794				Х
	n Laboratory - N						
	ield Laboratory		25079				
Exte	rnal Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	DUP06_21052 0	May 20, 2021		Soil	M21-My45986		Х
2	DUP04_21052 0	May 20, 2021		Soil	M21-My45987	Х	
Test	Counts					1	1

CT 24/5/21-2-27pm conner won By Posto & Jake NA AN Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. 197539 Additional Information ر يُ کِ 2 RECEIVED BY: J. Carred DATE/TIME Yes Y68 FOR LABORATORY USE ONLY (Circle) Random Sample Temperature on Receipt: Free Ice / frozen ice bricks present upon receipt? ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Milika (ALS) DATECTIME: USTM Where Metals are required, specify Total (millored bottle required) or Dissolved (field filtered bottle required). Work Order Reference EM2109392 () cont **Environmental Division** Telephone: +61-3-8549 9600 RELINQUISHED BY: OF: 1 2 3 4 5 6 7 Other comment: 45 of ELS Pecalved 21/5/21 Relinquishall 24/5/21 Melbourne 05-17 SOC: 130 coc 1 2 3 4 5 6 7 COC SEQUENCE NUMBER DATE/TIME: ONOWRA 4/13 Ge. Ph. 924423 2063 E. RECEIVED BY: 200 0. (Standard TAT may be longer for some tests e.g.. \tag{Standard or urgent TAT (List due date): \text{Ultra Trace Organics} 17.30 (xay) Hg Standard TAT (List due date): 35 7-50-02 RELINQUISHED BY: TATOT SABNIATNOD 5 DATE/TIME: (refer to CONTAINER INFORMATION ہے TYPE & PRESERVATIVE codes below) 254 ALS QUOTE NO .: ME - 167 TURNAROUND REQUIREMENTS: SAMPLER MOBILE: CLILG 841 973 CONTACT PH: OUT } 003 73% ٠ SAR でして EDD FORMAT (or default): نح Email Reports to (will default to PM if no other addresses are listed): ソルムへく XIATAM 20.5 09:50 20-5 39:20 20-5 08:30 Email Invoice to (will default to PM if no other addresses are listed): accounts DATE / TIME SAMPLE DETAILS MATRIX: SOLID (S) WATER (W) COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ALS Laboratory: please tick → CHAIN OF CUSTODY PROJECT MANAGER: SHANE CILIAM OFFICER SOUTH ELAN LISHMAND DJ804 - 21 0570 DUPOS - 210520 0-1 - 914B BATE - 1:0 Brita - 5.1 BH10 - 2.0 ORDER NUMBER: 73,24554 SAMPLE ID BA76 - 0.1 Bris - 6.5 5.0 - 02 HB BH20 - 1.0 DH30 . 3.0 Buts 7.0 BM30 - 2.0 QH30 0.5 BH30 - 1.0 BH30 - 0.1 COC emailed to ALS? YES CLIENT: WSP SAMPLER: PROJECT: LABID j 0 ALS Q 4 و 70

Water Container Codes: P = Unpreserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved Plastic; AS = Sodium Hydroxide/Cd Preserved Plastic; AS = Amber Glass; Unpreserved Plastic; AP = Airfreight Unpreserved Plastic; F = Formaldehyde Preserved

| V = VOA Vial HCI Preserved Speciation bottle; SP = Suffuric Preserved; AV = Airfreight Unpreserved Vial SG = Suffuric Preserved Amber Glass; H = HCI preserved Plastic; HS = HCI preserved Speciation bottle; SP = Suffuric Preserved Solis; B = Unpreserved Bail

CHAIN OF	CUSTODY	ALS Laboratory: please tick ≯
HAIN OF	JSTODY	Labo
さ	ರ	

QWOLLONGONG 99 Kenny Street Wollongong NSW 2590 Ph. 02 4225 3125 E: portkembla@aksjkobal.com

★ Standard TAT (List due date): TURNAROUND REQUIREMENTS:

FOR LABORATORY USE ONLY (Circle)

Yes Free ice / frozen ice bricks present upon receipt?

Custody Seal Intact?

COC SEQUENCE NUMBER coc 1 2 3 4 5 OF: 1 2 3 4 5 RECEIVED BY:

☐ Non Standard or urgent TAT (List due date):

(Standard TAT may be longer for some tests e.g... Ultra Trace Organics)
ALS QUOTE NO.:.

N/A N/A

Random Sample Temperature on Receipt:

6 7 Other comment: RELINGUISHED BY:

RECEIVED BY: DATE/TIME:

Milika

DATE/TIME:

DATE/TIME:

EDD FORMAT (or default):

Email Invoice to (will default to PM if no other addresses are listed); accounts

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Email Reports to (will default to PM if no other addresses are listed):

COC emailed to ALS? YES

SAMPLER MOBILE:

CONTACT PH:

PROJECT: OFFICER SOUTH

CLIENT: WSP

ORDER NUMBER: PS 124 554

PROJECT MANAGER:

SAMPLER:

RELINQUISHED BY:

DATE/TIME:

2115/21 Reinguisted 24/5/21

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)

ELS ARCELLED

Z of

Where Metals are required, specify Totalmined bottle required) or Dissolved (field filed bottle required).

CONTAINER INFORMATION

MATRIX: SOLID (S) WATER (W)

ALS

(Jay) Hd

TOTAL CONTAINERS (refer to

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

Additional Information

TYPE & PRESERVATIVE codes below)

ASS سا

多

5

XIATAM

DATE / TIME

SAMPLE ID

LABID

20-5/12:40

0.1-6/HJ BH19-20

20 5/14:30

BM19 - 3.0

0-110 -0.1 BM16 - 0.5

8716 - 1:0

OHIE - 2.5

8 MIG - 3.0

Depos - 210820

30.5 R.40 ob; 21/5-02

Dulch - 210520

Figure 1 Const

BN21-0.1

S.O - S.Z.O のというという

BM21-3.0 874 -2-3

2

Water Container Codes: P = Unpreserved Pisstic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved Plastic; AP = Auffeight Unpreserved Plastic; F = Formaldehydo Preserved (Preserved Plastic; HS + HCI preserved Ball Areary SE = Spailo Bottle; ASS = Plastic Ball for Acid Sulphate Solis; B = Unpreserved Ball



Environment Testing

WSP Australia P/L MELB Lvl 15, 28 FreshwaterPlace Southbank VIC 3006





NATA Accredited Accreditation Number 1261 Site Number 1254

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 and proficiency testing scheme providers reports.

Attention: Shane Giliam

Report 797539-S

Project name OFFICER SOUTH

Project ID PS124554
Received Date May 24, 2021

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			DUP06_210520 Soil M21-My45986 May 20, 2021
Test/Reference	LOR	Unit	
Acid Sulfate Soils Field pH Test			
pH-F (Field pH test)*	0.1	pH Units	6.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3
Reaction Ratings*S05	-	comment	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.

DescriptionTesting SiteExtractedHolding TimeAcid Sulfate Soils Field pH TestBrisbaneMay 27, 20217 Days

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

Report Number: 797539-S



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Site # 1254 & 14271

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ABN: 50 005 085 521 web; www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: WSP Australia P/L MELB

Address: Lvl 15, 28 FreshwaterPlace

Southbank

VIC 3006

Project Name:

OFFICER SOUTH

Project ID:

PS124554

Order No.: Report #:

797539 9861 1111

Phone: Fax: 9861 1144 Received: May 24, 2021 2:27 PM Due: May 31, 2021

Priority: 5 Day

Shane Giliam **Contact Name:**

Eurofins Analytical Services Manager: Harry Bacalis

New Zealand

		Sa	mple Detail			HOLD	Acid Sulfate Soils Field pH Test
Melb	ourne Laborato	ory - NATA Site	# 1254 & 142	71		Х	
Sydr	ey Laboratory	- NATA Site # 1	8217				
	pane Laboratory						Х
Perti	n Laboratory - N	IATA Site # 237	36				
Mayf	ield Laboratory	- NATA Site # :	25079				
Exte	rnal Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	DUP06_21052 0	May 20, 2021		Soil	M21-My45986		х
2	DUP04_21052 0	May 20, 2021		Soil	M21-My45987	Х	
Test	Counts					1	1



Internal Quality Control Review and Glossary

General

- 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.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- 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.
- 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 ma/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

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 Toxicity Characteristic Leaching Procedure TCLP

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

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.
- 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.

Page 4 of 6



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)*	M21-My45986	CP	pH Units	6.8	6.8	pass	30%	Pass	

Report Number: 797539-S



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
 Yes

 Some samples have been subcontracted
 No

Qualifier Codes/Comments

Code Description

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:

Harry Bacalis Analytical Services Manager
Myles Clark Senior Analyst-SPOCAS (QLD)

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.

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.



ABN: 50 005 085 521

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New Zealand

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Christchurch **Auckland** 35 O'Rorke Road 43 Detroit Drive Penrose, Auckland 1061 Phone: +64 9 526 45 51 Rolleston, Christchurch 7675 Phone: 0800 856 450 IANZ # 1327 IANZ # 1290

Sample Receipt Advice

Company name:

WSP Australia P/L MELB

Contact name: Project name:

Shane Giliam OFFICER SOUTH

Project ID: Turnaround time: PS124554 5 Day

Date/Time received

May 25, 2021 8:20 AM

Eurofins reference

797669

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

Contact

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

Harry Bacalis on phone: or by email: HarryBacalis@eurofins.com

Results will be delivered electronically via email to Shane Giliam - sgiliam@pb.com.au.

Note: A copy of these results will also be delivered to the general WSP Australia P/L MELB email address.





Australia

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Unit F3, Buildin
16 Mars Road
Lane Cove We
NATA # 1261
Phone: +61 2

Site # 1254 & 14271

 Brisbane
 Perth

 1/21 Smallwood Place
 46-48 Banksia Road

 Murarrie QLD 4172
 Welshpool WA 6106

 Phone: +61 7 3902 4600
 Phone: +61 8 9251 9600

 NATA # 1261 Site # 20794
 NATA # 1261

 Site # 23736
 Site # 23736

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

 35 O'Rorke Road
 43 Detroit Drive

 Penrose, Auckland 1061
 Rolleston, Christchurch 7675

 Phone : +64 9 526 45 51
 Phone : 0800 856 450

 IANZ # 1327
 IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: WSP Austra

WSP Australia P/L MELB Lvl 15, 28 FreshwaterPlace

Southbank

VIC 3006

Project Name:

OFFICER SOUTH

Project ID:

Address:

PS124554

Order No.:

Fax:

Report #: Phone: 797669 9861 1111 9861 1144

Priority: Contact Name:

Received:

Due:

Jun 1, 2021 5 Day Shane Giliam

May 25, 2021 8:20 AM

New Zealand

Eurofins Analytical Services Manager: Harry Bacalis

		Sa	mple Detail			Acid Sulfate Soils Field pH Test	Moisture Set
Sydr	Melbourne Laboratory - NATA Site # 1254 & 14271 Sydney Laboratory - NATA Site # 18217						
Brist	pane Laboratory	/ - NATA Site #	20794			Χ	Х
Perti	n Laboratory - N	IATA Site # 237	'36				
Perth Laboratory - NATA Site # 23736 Mayfield Laboratory - NATA Site # 25079							
Exte	rnal Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	DUP08- 210521	May 21, 2021	8:50AM	Soil	M21-My47278	Х	х
2	DUP10- 210521	May 21, 2021	10:00AM	Soil	M21-My47279	Х	х
Test	Counts					2	2

CHAIN OF CUSTODY	ALS Laboratory:	- voices
ច ថ		
STA STA		WSP

JNE/NG457Li Pr 02/1014/26

CELENI: NO.	TURNAROUND REQUIREMENTS:	The Standard TAT (think due date):		FOR LABORATORY USE ONLY (Circle)	rcle)	
OFFICE:	(Standard TAT may be longer for some tests e.g. \(\)\) Non Standard or urgent TAT (List due date): Ultra Trace Ornanics)	e.g Non Standard or urgent TAT (L.	st due date):	Custody Seal Intact?	Yes	NA
PROJECT: BIFFILER SOUTH	ALS QUOTE NO.: ME - 16.7 - 21	2.1	COC SEQUENCE NUMBER	Free ice / frozen ice bricks present upon	Yes	NA
ORDER NUMBER: PS124554			2	6 7 Random Sample Temperature on Receipt:	þ	
PROJECT MANAGER: SHANE GILLAM	CONTACT PH: Q477 1 363 771		OF: 1 2 3 4 5 6	6 7 Other comment:		
SAMPLER: EVAN CISHINGING	SAMPLER MOBILE: OU 26 89, 633		RECEIVED BY:	ıY:	RECEIVED BY:	
COC emailed to ALS? YES	EDD FORMAT (or default):	(S-4) S. W				
Email Reports to (will default to PM if no other addresses are listed): Shawe V ECLAN	isted): Shane + Ever	DATE/TIME:	DATE/TIME:	DATE/TIME: D	DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed): accounts	sted): accounts	シサル				

	SAMTLE DEIALS MATRIX: SOLID (S) WATER (W)	CONTAINER INFORMATION	RMATION	Where Met	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfillered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID SAMPLE ID	DATE / TIME	TYPE & PRESERVATIVE COdes below)	(refer to	CONTRINERS (AV) HG		Comments on likely contaminant levels, ditutions, or samples requiring specific QC analysis etc.
8H = - 0.1	24.5 (67:50 5	S JAR + AIS	6.7	1 2		(535
BH11-0-5				`		Secented 21 (5
BH11-1-0				1		Tomp: G-7
BH11-20				\		Ley technicks I NA
13411. 3.C				\		
BH 04-5.1	21-5 08.30					
GH09-2.5						
Bto 9- 1-3						
8404-23						15 5 40.20
BH03-01	24-5 08:50			\		O.
BH33-0.5				\		C c.
3103 - 1.0				1		5.6
Bhs 3-20						
PM53-7.0						
DUPORT-210521						
かくらん - そのかん						MAN TO BESTER

Water Container Codes: P = Unpressived Plastic: N = Nitric Preserved Plastic: ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved; S = Sodium Hydroxide Preserved; N = Anther Glass Unpreserved Plastic: N = Nitric Preserved; N = VOA Vial Sulfuric Preserved; N = VOA Vial Sodium Bisulphate Preserved; N = VOA Vial Sodium Bisulphate Preserved Sulfuric Preserved An = Auftraght Unpreserved V = VOA Vial Sodium Bisulphate Preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Bisulphate Preserved Bottle; E = EDTA Preserved Bottle; ST = Stenle Bottle; ASS = Plastic Bas for Acid Sulfuele Solis; B = Unpreserved Bas 797669



CHAIN OF CUSTODY

N/A NA 2 RECEIVED BY: DATE/TIME: Yes FOR LABORATORY USE ONLY (Circle) Random Sample Temperature on Receipt: Free ice / frozen ice bricks present upon receipt? Custody Seal Intact? RELINQUISHED BY: Other comment: DATE/TIME: 6 7 coc 1 2 3 4 5 6 7 COC SEQUENCE NUMBER 3 4 5 RECEIVED BY: OF: 1 2 DATE/TIME: □ Non Standard or urgent TAT (List due date): → Standard TAT (List due date): RELINGUISHED BY: M.S. (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) TURNAROUND REQUIREMENTS: SAMPLER MOBILE: OUTLE 841033 ALS QUOTE NO .: EDD FORMAT (or default): CONTACT PH: Email Invoice to (will default to PM if no other addresses are listed): accounts Email Reports to (will default to PM if no other addresses are listed): ALS Laboratory: please tick ⇒ PROJECT MANAGER: STHAP' & CICLAIN ならればらて たまらい PROJECT: OFFICER SOUTH ORDER NUMBER: (5 (24 554 COC emailed to ALS? YES CLIENT: WSP SAMPLER: OFFICE:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	Name of the last o	MATRIX: SOLID (S) WATER (W)				Whe	re Metals are requi	ired, specify Total (unfi	Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	a (Tiela	
	SAMPLEID	DATE / TIME	XIRTAM	TYPE & PRESERVATIVE codes below)	of Perfect of Autonomous Autot SABINIATMOD	(tay) Hd	12 . Nuch			Comr dilulic analy	Comments on likely contaminant levels, ditutions, or samples requiring specific QC analysis etc.
SHIP	1.0-4148	4-5 10:00	5	5AC + AB	7						
SHI	BH17-0-5					\					
BNO	Bur - 1.0					1					
SHO	84ch - 2-c					\					
Buc	Bur - 3.0					\					
Dur	שונים היסטום					\					
200	0000 - 210521					1				12	Forward to Eurofiles
N N	BH22 - 0.11	21-5 10:20									
g	BK12 / B.S	21-7									
B	BH12 ~ 1.0										
Qi	BH12 2.0										
P. C.	1.0 - 1	21-5/11:45									
S	BHI4-0.5										
0	Duly - Co										
	BMW-2.0										
S	Bra Lo.	21-5 (12.05									

Mater Consider Preserved Plastic: N = Nitric Preserved Plastic: N = Nitric Preserved Plastic: N = Nitric Preserved Plastic: N = Nitric Preserved Plastic: N = Nitric Preserved Plastic: N = Sodium Hydroxide Preserved: S = Sodium Hydroxide Preserved: S = Sodium Propreserved Plastic: N = HCI preserved Plastic: N = HCI preserved Plastic: N = HCI preserved Plastic: P = Suffuric Preserved Plastic: F = Formaldehyde Preserved Plastic: P = Formaldehyde Preserved Plastic: P = Formaldehyde Preserved Plastic: P = Diffusion Preserved Pl



Environment Testing

WSP Australia P/L MELB Lvl 15, 28 FreshwaterPlace Southbank VIC 3006





NATA Accredited Accreditation Number 1261 Site Number 1254

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 and proficiency testing scheme providers reports.

Attention: Shane Giliam

Report 797669-S

Project name OFFICER SOUTH

Project ID PS124554
Received Date May 25, 2021

Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			DUP08-210521 Soil M21-My47278 May 21, 2021	DUP10-210521 Soil M21-My47279 May 21, 2021
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	6.9	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.5	5.0
Reaction Ratings*S05	-	comment	3.0	2.0
% Moisture	1	%	24	17



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	Brisbane	May 27, 2021	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
% Moisture	Brisbane	May 28, 2021	14 Days

- Method: LTM-GEN-7080 Moisture



Australia

NATA # 1261

Site # 1254 & 14271

Melbourne 6 Monterey Road Dandenong South VIC 3175 16 Mars Road Phone: +61 3 8564 5000

Sydney Unit F3, Building F Lane Cove West NSW 2066 Phone: +61 7 3902 4600 Phone: +61 2 9900 8400 NATA # 1261 Site # 18217

Perth 46-48 Banksia Road Welshpool WA 6106 Phone: +61 8 9251 9600 NATA # 1261 Site # 20794 NATA # 1261 Site # 23736

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

Auckland Christchurch 35 O'Rorke Road Penrose, Auckland 1061 Phone: +64 9 526 45 51 IANZ # 1327

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

ABN: 50 005 085 521 web; www.eurofins.com.au email: EnviroSales@eurofins.com

WSP Australia P/L MELB

Lvl 15, 28 FreshwaterPlace

Southbank

VIC 3006

Project Name:

Company Name:

OFFICER SOUTH

Project ID:

Address:

PS124554

Order No.:

Report #: 797669 Phone: 9861 1111

Fax: 9861 1144

Brisbane

1/21 Smallwood Place

Murarrie QLD 4172

Received: May 25, 2021 8:20 AM Due: Jun 1, 2021

Priority: 5 Day Shane Giliam **Contact Name:**

Eurofins Analytical Services Manager: Harry Bacalis

New Zealand

Sample Detail Melbourne Laboratory - NATA Site # 1254 & 14271							
		-		71			
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							Х
Perth Laboratory - NATA Site # 23736							
	ield Laboratory		25079				
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	DUP08- 210521	May 21, 2021	8:50AM	Soil	M21-My47278	Х	х
2	DUP10- 210521	May 21, 2021	10:00AM	Soil	M21-My47279	Χ	х
Test Counts							2



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 ug/L: micrograms per litre ug/L: micrograms per litre

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.

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

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)*	M21-My53320	NCP	pH Units	9.3	9.5	pass	30%	Pass	
Duplicate									
Result 1 Result 2 RPD									
% Moisture	M21-My47279	CP	%	17	17	1.0	30%	Pass	

Report Number: 797669-S



Comments

Sample Integrity

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

Qualifier Codes/Comments

Code Description

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:

Harry Bacalis Analytical Services Manager
Myles Clark Senior Analyst-SPOCAS (QLD)

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.

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.



ABN: 50 005 085 521

www.eurofins.com.au

EnviroSales@eurofins.com

New Zealand

Australia

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Sydney Unit F3. Building F NATA # 1261 Site # 18217

NATA # 1261 Site # 40017 in smallwood Place Murarrie QLD 4172 Phone: +61 7 3902 4600 NATA # 1261 Site # 40017 1/21 Smallwood Place NATA # 1261 Site # 20794

46-48 Banksia Road Welshpool WA 6106 Phone: +61 8 9251 9600 Site # 23736

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

Sample Receipt Advice

Company name:

WSP Australia P/L MELB

Contact name: Project name:

Evan Lishmund **OFFICER SOUTH**

Project ID: Turnaround time: PS124554

Date/Time received

Jun 2, 2021 2:38 PM

Eurofins reference

5 Day 800029

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

Contact

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

Harry Bacalis on phone: or by email: HarryBacalis@eurofins.com

Results will be delivered electronically via email to Evan Lishmund - Evan.lishmund@wsp.com.

Note: A copy of these results will also be delivered to the general WSP Australia P/L MELB email address.





Environment Testing

Australia

Melbourne Sydney
6 Monterey Road Unit F3, Buildin
Dandenong South VIC 3175
Phone : +61 3 8564 5000 Lane Cove We
NATA # 1261 Phone : +61 2

Site # 1254 & 14271

Perth 46-48 Banksia Road Welshpool WA 6106 Phone: +61 8 9251 9600 NATA # 1261 Site # 23736 Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Phone : +61 2 4968 8448 NATA # 1261 Site # 25079
 Auckland
 Christchurch

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 Phone : 0800 856 450

 IANZ # 1327
 IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: WSP Austr

WSP Australia P/L MELB Lvl 15, 28 FreshwaterPlace

Southbank

VIC 3006

Project Name:

OFFICER SOUTH

Project ID:

Address:

PS124554

Order No.:

Report #: Phone: 800029 9861 1111

Fax: 9861 1144

Received: Jun 2, 2021 2:38 PM **Due:** Jun 9, 2021

Priority: 5 Day
Contact Name: Evan Lishmund

Eurofins Analytical Services Manager: Harry Bacalis

New Zealand

Sample Detail							Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Exchangeable Sodium Percentage (ESP)
Melb	ourne Laborato	ory - NATA Site	# 1254 & 142	271				Х	Х	Х
Sydr	ney Laboratory	- NATA Site # 1	8217							
	bane Laborator						Х	Х	Х	Х
	h Laboratory - N									
_	field Laboratory		25079							
	External Laboratory				Х					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	DUP06_21052 0	May 20, 2021		Soil	M21-Jn04610	Х		Х		х
2	DUP08_21052 0	May 21, 2021		Soil	M21-Jn04611		Х		Х	
3	DUP10_21052 0	May 21, 2021		Soil	M21-Jn04612	Х		Х		Х
Test Counts						2	1	3	3	2

RE: Officer South - Additional Analysis

Harry Bacalis < Harry Bacalis@eurofins.com>

Wed 2/06/2021 2:43 PM

To: Lishmund, Evan < Evan.Lishmund@wsp.com>

Cc: Giliam, Shane <Shane.Giliam@wsp.com>; #AU_CAU001_EnviroSampleVic <EnviroSampleVic@eurofins.com>

Thanks Evan

Canh - STD TAT

Kind regards,

Harry Bacalis

Phone: +61 3 8564 5064 Mobile: +61 438 858 924

Email: <u>HarryBacalis@eurofins.com</u>

From: Lishmund, Evan < Evan.Lishmund@wsp.com>

Sent: Wednesday, 2 June 2021 2:38 PM

To: Harry Bacalis < Harry Bacalis@eurofins.com> Cc: Giliam, Shane <Shane.Giliam@wsp.com> Subject: Officer South - Additional Analysis

EXTERNAL EMAIL*

Harry,

Can I please request the below analysis on standard TAT:

Sample ID	Laboratory Sample ID	Emerson Class Dispersion Testing + Exchangeable Sodium Percentage	Chromium Reducible Sulfur Suite
DUP06-210520	M21-My45986	Х	
DUP08-210521	M21-My47278		Х
DUP10-210521	M21-My47279	X	N.

Please let me know if there's any issues.

Cheers.

Evan Lishmund Environmental Scientist

T: +61 3 8327 8691

Evan.Lishmund@wsp.com

WSP Australia Pty Limited Level 15, 28 Freshwater Place Southbank, VIC 3006 Australia

wsp.com/au

MY45986-HTS13 MY47278-BMS MY47279-L

800029 Jaka

Therefore I between the form of the form o		Report results to: EnviroReportsAU@eurofins.com	nterey Rd, Dandenong South	Send invoices ta: CAU001_AP@eurofins.com
		oda	elbo	pu
Eurofins Further Order for Extensive States States	Receiving Laboratory: EASTWEST	Address: 82 PLAIN STREET	N 2340	Telephone:

	Eurofins ID	Matrix	Tests Required	Sampling Date	1
	M21-Jn04610	SOIL	TTP DOLLAR TO THE TOTAL TO THE	20/05/2021	Glass iar 2 1 0 8 6 4 -1
	M21-Jn04612	SOIL	Emerson Class Number	21/05/2021	
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					THE RESIDENCE AND ASSOCIATION OF THE PERSON

And Charles and Ch	And the second s	A TOTAL CONTRACTOR	Table 1 - Transference 1 - Aug. 10-		POPALATA MANAGEMENT AND AND AND AND AND AND AND AND AND AND
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* *PICA" (Ministro)	THE PARTY OF THE P		TOTAL MATERIAL TOTAL		
					TOTAL NATIONAL AND ADMINISTRATION OF THE PROPERTY OF THE PROPE
Total No. Samples:	2				

	2/06/2021	2. 7 11. 9001		
ustody	Date/Time:	Date/Time:	Date/Time:	Date/Time:
Chain of Custody	Jake Beaumont	4		THE PROPERTY OF THE PROPERTY O
The second secon	Relinquished by:	Received by:	Relinquished by:	Received by:

 \mathcal{V}' oll enquires please quote Ref. No. √ grage somple temp on receipt: (°C) Please complete this section and email a scan copy to EnviroReportsAU@eurofins.com Sample Receipt Advice (Receiving Lab Use Only) Samples Received Within Holding Times All Somples Received in Good Condition Samples Received with an Attempt to Chill All Documentation in Proper Order

210864



Environment Testing

WSP Australia P/L MELB Lvl 15, 28 FreshwaterPlace Southbank VIC 3006





NATA Accredited Accreditation Number 1261 Site Number 1254

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 and proficiency testing scheme providers reports.

Attention: Evan Lishmund

Report 800029-S

Project name OFFICER SOUTH

Project ID PS124554
Received Date Jun 02, 2021

Client Sample ID			DUP06 210520	DUP08 210520	DUP10 210520
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M21-Jn04610	M21-Jn04611	M21-Jn04612
Date Sampled			May 20, 2021	May 21, 2021	May 21, 2021
Test/Reference	LOR	Unit	,	, ,	, ,
resurveilerence	LOI	Offic			
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	43	-	290
Exchangeable Sodium Percentage (ESP)	0.1	%	13	-	32
% Moisture	1	%	4.4	18	17
Emerson Class Number	1	units	see attached	-	see attached
Chromium Suite	'	1			
pH-KCL	0.1	pH Units	-	4.9	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	36	-
sulfidic - TAA equiv. S% pyrite	0.003	% pyrite S	-	0.060	-
Chromium Reducible Sulfur ^{S04}	0.005	% S	-	< 0.005	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	< 3	-
Sulfur - KCl Extractable	0.02	% S	-	N/A	-
HCI Extractable Sulfur Correction Factor	1	factor	-	2.0	-
HCI 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	-	N/A	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	N/A	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt) ^{S03}	0.02	% S	-	N/A	-
ANC Fineness Factor		factor	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	0.06	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	36	-
CRS Suite - Liming Rate ^{S01}	1	kg CaCO3/t	-	2.7	-
Extraneous Material					
<2mm Fraction	0.005	g	-	200	-
>2mm Fraction	0.005	g	-	< 0.005	-
Analysed Material	0.1	%	-	100	-
Extraneous Material	0.1	%	-	< 0.1	-



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
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Jun 03, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
Exchangeable Sodium Percentage (ESP)	Melbourne	Jun 04, 2021	28 Days
- Method: LTM-MET-3060 - Cation Exchange Capacity (CEC) & Exchangeable Sodium Percentage (ESP)			
% Moisture	Brisbane	Jun 08, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Jun 04, 2021	6 Week
- Method: LTM-GEN-7070 Chromium Reducible Sulfur Suite			
Extraneous Material	Brisbane	Jun 04, 2021	6 Week

Report Number: 800029-S



Australia

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WSP Australia P/L MELB

Lvl 15, 28 FreshwaterPlace

Southbank

VIC 3006

Project Name:

Company Name:

OFFICER SOUTH

Project ID:

Address:

PS124554

Order No.: Report #:

Phone:

800029

Fax:

9861 1111 9861 1144 **Received:** Jun 2, 2021 2:38 PM

 Due:
 Jun 9, 2021

 Priority:
 5 Day

Contact Name: Evan Lishmund

Eurofins Analytical Services Manager: Harry Bacalis

		Sa	mple Detail			Emerson Class Number	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Exchangeable Sodium Percentage (ESP)
Melb	ourne Laborato	ory - NATA Site	# 1254 & 142	271				Х	Х	Х
Sydr	ney Laboratory	- NATA Site # 1	8217							
Bris	bane Laborator	y - NATA Site #	20794				Х	Х	Х	Х
	h Laboratory - N									
_	field Laboratory		25079							
	rnal Laboratory				1	Х				
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID					
1	DUP06_21052 0	May 20, 2021		Soil	M21-Jn04610	Х		Х		Х
2	DUP08_21052 0	May 21, 2021		Soil	M21-Jn04611		Х		Х	
3	DUP10_21052 0	May 21, 2021		Soil	M21-Jn04612	Х		х		х
Test	Counts					2	1	3	3	2



Internal Quality Control Review and Glossary

General

- 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 ug/L: micrograms per litre ug/L: micrograms per litre

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.

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

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.



Environment Testing

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Conductivity (1:5 aqueous extract at	25°C as rec.)		uS/cm	< 10			10	Pass	
Exchangeable Sodium Percentage (ESP)		%	< 0.1			0.1	Pass	
LCS - % Recovery									
Chromium Suite									
pH-KCL			%	100			80-120	Pass	
Acid trail - Titratable Actual Acidity			%	97			80-120	Pass	
Chromium Reducible Sulfur			%	99			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 (1:5 aqueous extract at 25°C as rec.)	M21-Jn03267	NCP	uS/cm	80	88	9.1	30%	Pass	
% Moisture	M21-Jn04216	NCP	%	24	24	<1	30%	Pass	
Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
pH-KCL	B21-Jn06637	NCP	pH Units	8.1	8.1	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	B21-Jn06637	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	B21-Jn06637	NCP	% pyrite S	< 0.003	< 0.003	<1	30%	Pass	
Chromium Reducible Sulfur	B21-Jn06637	NCP	% S	0.014	0.013	7.0	30%	Pass	
Chromium Reducible Sulfur -acidity units	B21-Jn06637	NCP	mol H+/t	9.0	8.4	7.0	30%	Pass	
Sulfur - KCl Extractable	B21-Jn06637	NCP	% S	0.02	0.02	1.0	30%	Pass	
HCI Extractable Sulfur	B21-Jn06637	NCP	% S	N/A	N/A	N/A	30%	Pass	
Net Acid soluble sulfur	B21-Jn06637	NCP	% S	N/A	N/A	N/A	30%	Pass	
Net Acid soluble sulfur - acidity units	B21-Jn06637	NCP	mol H+/t	N/A	N/A	N/A	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	B21-Jn06637	NCP	% S	N/A	N/A	N/A	30%	Pass	
Acid Neutralising Capacity (ANCbt)	B21-Jn06637	NCP	% CaCO3	1.2	1.3	7.0	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	B21-Jn06637	NCP	% S	0.38	0.41	7.0	30%	Pass	
ANC Fineness Factor	B21-Jn06637	NCP	factor	1.5	1.5	<1	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	B21-Jn06637	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	B21-Jn06637	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
CRS Suite - Liming Rate	B21-Jn06637	NCP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Exchangeable Sodium Percentage (ESP)	M21-Jn04612	СР	%	32	32	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 Yes Samples received within HoldingTime Yes Some samples have been subcontracted Yes

Qualifier Codes/Comments

<u> </u>	
Code	Description
Code	DESCRIPTION

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'

S01

Retained Acidity is Reported when the pHKCl is less than pH 4.5 S02

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:

Harry Bacalis Analytical Services Manager Senior Analyst-Metal (VIC) Emily Rosenberg Myles Clark Senior Analyst-SPOCAS (QLD) Scott Beddoes Senior Analyst-Inorganic (VIC)

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.

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.



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ANALYSIS REPORT SOIL

PROJECT NO: EW210864

Customer: **EUROFINS MELBOURNE**

Address: 2-5 Kingston Town Close 2-5

Kingston Town Close Oakleigh VIC

3164 OAKLEIGH VIC 3164

Attention: Harry Bacalis

03-8564 5000 Phone:

Fax:

enviroreportsAU@eurofins.com Email:

Date of Issue: 15/06/2021

Report No:

Date Received: 7/06/2021

Matrix: Soil

800029 Location:

Sampler ID: Client

20/05/2021 Date of Sampling:

Sample Condition: Acceptable

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

Signed:

Anne Michie



NATA Accredited Laboratory 12360 Accredited for compliance with ISO/IEC 17025 - Testing

This analysis relates to the sample submitted and it is the client's responsibility to make certain the sample is representative of the matrix to be tested.

Samples will be discarded one month after the date of this report. Please advise if you wish to have your sample/s returned.

results you can rely on



ANALYSIS REPORT

PROJECT NO: EW210864 Location: 800029

		CLIE	NT SAMPI	E ID	M21-Jn04610	M21-Jn04612	
			DE	РТН	DUP06_21052 0	DUP10_21052 0	
Test Parameter	Method Description	Method Reference	Units	LOR	210864-1	210864-2	
Emerson Aggregate Test	Class	PMS-21	Number	na	2	2	

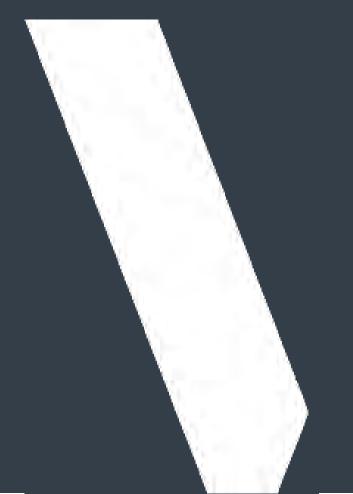
This Analysis Report shall not be reproduced except in full without the written approval of the laboratory. Soils are air dried at 40° C and ground <2mm.

NB: LOR is the Lowest Obtainable Reading.

DOCUMENT END



APPENDIX F GROUNDWATER GAUGING



F1 GROUNDWATER GAUGING AND MONITORING RESULTS

Groundwater results recorded following installation of groundwater monitoring wells MW01 - MW03 are recorded in Table F.1 below.

It is noted that monitoring wells were gauged within 7 days of installation, and the readings are considered to be indicative only.

The calibration certificate for the water quality meter (YSI) is provided in this appendix.

Table F.1 Groundwater parameter summary

LOCATION	DATE/TIME	SWL	рΗ	REDOX.	D.O.	E.C.	TEMP.	COLOUR	TURB. / COMM.
		MBTOC	PH	MV	PPM	MS/CM	CELC.		
MW01	24/5 12:45	3.39	6.37	174	10.8	12.16	17.1	Clear	None, TD 3.1
	24/5 12:55	(purge 5L)	6.19	167.2	-	12.21	16.9	Clear	Slight
MW02	24/5 13:30	3.30	6.09	154	5.11	12.46	16.4	Clear	None, TD 3.1
MW03	24/5 14:00	DRY	-	-	-	-	-	-	Total depth 7.1
Well at 235 Lecky Road Gin Gin	24/5 12:30	4.63	-	-	-	-	-	-	Total depth 16.15

Equipment Calibration Form

YSI ProPlus



Enqip #: 14121

Company: WSP Australia Pty Limited

Consultant: Shane Giliam

PO #: PS123382 - Used from 19MAY2021-23MAY2021 at VPA Officer South (PS124554)

Certificate #: 20780

INSTRUMENT IDENTIFICATION

Model Number:

6050000

Serial Number:

18G100553

Instrument Type:

YSI ProPlus

INSPECTION RECORD

Batteries Checked:PASSDate & Time:PASSElectrodes Cleaned/Checked:PASSTemperature:PASS

	CALIE	RATION DETAILS	
Sensor	Cal Solution	Value	Reading
	Buffer 4.00	4.00 pH	3.99 рН
pH	Buffer 7.00	7.00 pH	7.00 pH
Redox	Standard ORP	234.5 mV @ 20 °C	234.5 mV
_	Zero Dissolved Oxygen	0.0 %	0.0 %
O ₂ ——	Air	100.0 %	99.9 %
onductivity	Standard Conductivity	2.76 mS/cm	2.76 mS/cr

Calibration Successful: YES

Calibrated By: Doyle Schapendonk Test Date: 17/05/2021



Instrument Quality Report

Interface Meter



Enqip #: 14121

Company: WSP Australia Pty Limited

Consultant: Shane Giliam

PO #: PS123382 - Used from 19MAY2021-23MAY2021 at VPA Officer South (PS124554)

Certificate #: 20781

INSTRUMENT IDENTIFICATION

Instrument Type: Solinst Interface Meter

Model Number: 122

122

Serial Number:

IM-0524

INSPECTION RECORD

Battery:PASSWater Tone:PASSTape Condition:PASSHydrocarbon Tone:PASS

Tested By: Will Hatzimihalis Test Date: 17/05/2021



ABOUT US

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